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## **2023 Small Grains Report**

**Southcentral and Southeast Idaho Cereals Research and Extension Program**

*Juliet Marshall, Belayneh A. Yimer, Sidrat Abdullah, Tod Shelman, Linda Jones, Clayton Balfe, Justin Hatch, and Sarah Windes*



**University of Idaho**  
College of Agricultural and Life Sciences

## **Cover Images**

Field in Idaho Falls of 2023 Extension Variety Trial plots.

### **Southcentral and Southeastern Idaho Cereals Research and Extension Program**

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Luke Adams - Rupert  
Taylor Grant, Grant 4-D Farms – Rupert  
Marc Thiel – Idaho Falls  
Cody Cole – Soda Springs

### **Cereals Research and Extension Employees**

Martha Carrillo

### **Other UI Employees**

|                 |                  |
|-----------------|------------------|
| Chad Jackson    | Kristi Copeland  |
| Lyona Anderson  | Sherrie Mauroner |
| Ericka Ziebarth | Beth Brune       |
| Todd Carter     |                  |

### **UI Extension Educators**

Joseph Sagers - Jefferson County  
Reed Findlay - Bannock and Bingham Counties  
Jason Thomas - Minidoka County  
Ron Patterson - Bonneville County

### **UI Extension Educators (continued)**

Bracken Henderson - Franklin County  
Terrell Sorensen - Power County  
Justin Hatch – Caribou County  
Tom Jacobsen – Fremont County  
Jared Gibbons – Madison County

### **About the Authors**

**Juliet M. Marshall** is the Chair of the Department of Plant Sciences, UI and the Cereals Cropping Systems Agronomist & Pathologist with the UI SC & SE Idaho Cereals Extension Program.

**Belayneh A. Yimer** is a USDA-ARS Researcher at the USDA Aberdeen, ID facility.

**Sidrat Abdullah** is a Research Associate II with the UI SC & SE Idaho Cereals Extension Program.

**Tod Shelman** is a Scientific Aide II with the UI SC & SE Idaho Cereals Extension Program.

**Linda Jones** is a Technical Aide II with the UI SC & SE Idaho Cereals Extension Program.

**Clayton Balfe** is a Research Assistant with the UI SC & SE Idaho Cereals Extension Program.

**Justin Hatch** is Extension Educator, Caribou County  
**Sarah Windes** is the Lab Manager of the UI Wheat Quality Laboratory at Aberdeen.

### **Peer Reviewed by**

John Burns – Washington St Univ., prof. emeritus  
Dr. Dale Clark – Nutrien Ag  
Dr. Chris Rogers – USDA-ARS, Kimberly  
Chad Jackson – University of Idaho

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# 2023 Small Grains Report for Southcentral and Southeastern Idaho

*Juliet M. Marshall, Belayneh A. Yimer, Sidrat Abdullah, Tod Shelman, Linda Jones, Clayton Balfé, Justin Hatch, and Sarah M. Windes*

## Additions and Changes:

The irrigated winter trials in Rupert were abandoned due to poor stand from winter kill. The dryland location of Rockland was also damaged and yields were not reported. Therefore, dryland winter trials were reported only in two locations: Ririe and Soda Springs.

## Introduction

The objective of the University of Idaho Small Grain Performance Trials is to provide an unbiased appraisal and evaluation of currently available varieties and advanced experimental lines over multiple locations and years. This information will assist Idaho producers in comparing and selecting varieties best suited to their area and growing conditions. Variety selection is an important part of the economic viability of Idaho crops, and crop enterprise budgets are available at the Department of Agricultural Economics and Rural Sociology website <https://www.uidaho.edu/cals/idaho-agbiz/crop-budgets>.

Varietal development programs strive not only for greater yield potential, but also for improved end-use quality, better disease and insect resistance, yield stabilization through improved winter hardiness, better straw strength, and other agronomic traits. Bringing a new variety to the marketplace is a cooperative effort by many individuals and organizations.

Varieties are best evaluated by comparing performance over several locations and preferably over more than one year. Varietal performance can change in response to both environmental and cultural/management conditions. This report summarizes yield and agronomic data of small grain (wheat and barley) trials

conducted throughout Southcentral and Southeastern Idaho that were harvested in 2023, milling and baking data from trials harvested in 2022, as well as disease data when available from Aberdeen (stripe rust and FHB), Kimberly (FHB) and Logan, UT (dwarf bunt).

## Materials & Methods

### Locations

Cereal trials were established at seven winter and five spring locations throughout SC and SE Idaho during the fall of 2022 and the spring of 2023. For location details, please see the descriptions on pages 6 to 12. Soda Springs winter & spring, Ririe and Rockland winter trials were grown under dryland conditions. Rockland trials were harvested but are not reported due to winter kill and resulting low stands. All other trials were grown under irrigation. The trials at Aberdeen, Tetonia and Kimberly were grown at UI Research and Extension Centers, and the remaining trials were grown in producers' fields. The Rupert winter trial was not harvested due to damage from winter kill.

### Agronomic Practices

Seed was planted at the following rates:

- Irrigated Wheat: 1,000,000 seeds per acre or approximately 95 pounds per acre.
- Irrigated Barley: 800,000 seeds per acre or approximately 80 pounds per acre.
- Dryland Wheat: 700,000 seeds per acre or approximately 65 pounds per acre.
- Dryland Barley: 600,000 seeds per acre or approximately 60 pounds per acre.

Thousand kernel weights and planting rates in pounds per acre for each variety are reported in Table 1 (page 13). Row spacing was set at 7-inch using double disk openers for all irrigated locations and the Soda Springs winter and spring dryland locations. The Rockland dryland location used a 12-inch row spacing with shanks preceding double disk openers. Plots at all winter locations were planted 5 feet wide by 14 feet long then reduced back to 10 feet long using glyphosate herbicide or tillage. Spring locations were planted 5 feet wide by 20 feet long then sprayed or tilled back to 16 feet. All entries were replicated 4 times at each location in a randomized complete block design. Except for planting and harvest operations, nitrogen fertilization, and miscellaneous maintenance, trials established in producers' fields received the same "grower management" or cultural operations as applied to the surrounding commercial wheat or barley field.

Nitrogen fertilizer in irrigated locations was managed according to the following methodology: Yield goals (bu/A) were set for each class at each location using historical yield data. These yield goals were used to calculate optimal fertility amounts according to the following methods: Soft white winter wheat, soft white spring wheat, and winter barley; lbs/acre nitrogen needed = 2 times yield goal. Hard winter and hard spring wheat; lbs/acre nitrogen needed = 2.5 times yield goal, plus 40 lbs nitrogen/acre top-dressed at flowering. Spring 2 row barley: lbs/acre nitrogen needed = 1.7 times the yield goal. Hard wheat nurseries received the remaining balance of nitrogen as urea (46-0-0) top-dressed at heading using hand broadcast spreaders. Fertilizers and pesticides applied are listed on pages 6 to 12. Planting and harvesting operations by university personnel were timed to approximately coincide with corresponding cooperator operations. All nurseries were harvested with Wintersteiger Classic small plot combines, and data were recorded using either the Harvestmaster 800 Classic

GrainGage systems and Mirus software or the Zurn 150s with Harvestmaster weigh system.

### **Evaluation for Diseases**

***Fusarium head blight (FHB):*** The winter FHB nursery was established in one location (Kimberly) while spring FHB nurseries were established in two locations (Aberdeen and Kimberly). Each entry was planted in two head-rows in two replications. Corn spawn was spread in the field when plants were at the tillering growth stage in the spring. Additional inoculation of the trials was conducted by spraying the conidial suspension (100,000 spores/ml) at early anthesis. A sprinkler system was installed across the experimental plots to create conducive environment for disease infection and development. FHB rating (measured as FHB incidence and severity from 30 randomly chosen heads per entry) was done at the soft dough growth stage.

***Dwarf Bunt (*Tilletia controversa* Kühn, TCK):*** The trial was conducted in a dwarf bunt nursery established by the Utah State University in Logan. The nursery is artificially inoculated with TCK spores every year. Each winter wheat entries of the soft white winter and the hard winter wheat trials were planted in single head-row in two replications. Dwarf bunt severity was rated on each head row at maturity.

***Stripe Rust:*** Entries planted in the Extension Variety Trials (EVT) in Aberdeen were evaluated for their reaction to stripe rust under natural infection. Stripe rust was rated at the flag leaf stage as infection type (1 – 9 scale with 1 being the most resistant and 9 very susceptible), and severity was measured based on modified Cobb scale (0 – 100%).

### **Description of Agronomic Data**

Each entry at each location was measured for grain yield, test weight, plant height, heading date, and lodging (when present).

- Yield is calculated at 60 pounds per bushel for wheat and 48 pounds per bushel for barley.
- Test weight is reported in pounds per standard bushel.
- Plant height is reported in inches from the soil surface to the tip of the heads, awns excluded.
- Heading date is reported as the date when 50 percent of heads are fully emerged from the boot.
- Lodging is reported as the percent of the plot area that was not standing straight prior to harvest.

### **Description of End-use Quality Data**

Grain protein for each variety was analyzed with a Perten IM 9500 NIR grain analyzer. Protein data are found in conjunction with the agronomic data noted above in tables 4 to 61. These protein values are best utilized in comparisons between varieties within a nursery.

Due to the time necessary to complete milling and baking evaluations, test results from the Idaho Wheat Quality Laboratory are not available for the 2023 harvest in this report. Data are given for these characteristics from the 2022 harvest and are found in tables 62-75.

Milling and baking tests and plump seed evaluations use standardized testing methods and are described below:

- Flour protein: this is the flour protein content, measured on a fixed 14 percent moisture basis. Lower numbers are better for soft wheat; higher numbers are preferred for hard wheat.
- Break flour yield: represents ease of milling or kernel softness; higher numbers are preferred.
- Flour yield: the percent of flour obtained from a sample of wheat; higher percentages are better.

- Whole grain protein percent: protein content of the whole grain on a 12 percent moisture basis. Lower percentages are preferred for soft wheat; higher percentages are preferred for hard wheat.
- Hardness value: a measure of kernel hardness; generally soft white wheats are below 45, hard wheats are above 45.
- SRC (Solvent Retention Capacity): a measure of the flour performance in absorbing water and flour quality.

Additional evaluations include the following:

#### **Hard Wheats**

Bake volume: This is the volume of an experimental loaf of bread measured in cubic centimeters and reflects protein quality per unit of protein; higher volume is preferred.

#### **Soft Wheats**

Cookie diameter: Diameter of a cookie in centimeters; larger numbers are better.

#### **Barley**

- Plumps: Percent plump is the percent of a sample that stayed on top of a 5.5/64" x 3/4" slotted screen after shaking and consists of the 6/64" and 5.5/64" percentages combined. Both screen percentages are included in the report for increased precision.
- Thins: the percent of a sample that passed through a 5.5/64" x 3/4" screen after shaking.

#### **Statistical Analyses**

Data from each nursery were analyzed using SAS 9.4 software with the PROC GLM procedure. Fisher's protected LSD ( $\alpha=.05$ ) was used for mean comparisons. Three years pooled analyses, and data combined from locations in the growing season were analyzed using PROC Mixed Plots of SAS 9.4.

### **Statistical Interpretation**

Most tables have a least significant difference (LSD) statistic at the bottom of the table. This statistic is given at the 5 percent error level and is an aid in comparing varieties. If the measured values of any two varieties within a table differ by the LSD value or more, they may be considered different with a confidence level of 95 percent. If the measured values are less than the LSD value, the differences may be due to random error rather than real differences. Coefficient of variation (CV percent) statistic is a general measurement of the precision of each experiment. Lower CV values indicate less experimental variation and greater precision. Most tables that do not have the LSD and CV statistic are averages over locations or years where specific statistical analyses were not run on the combined data or are from data obtained from only one replication or are from a composite sample of all replications (e.g. quality data).

Most tables from individual locations also contain yield data from two previous years. The average, LSD, and CV for these data represent the original data set, not just the selected varieties presented in these tables. The Pr>F value indicates the validity of the LSD value (and is not reported in the tables); if the Pr>F value is equal to or greater than .05 (e.g. 0.1504; 0.6250), then the LSD value is void and the LSD value is reported as NS or not significant. This does not mean there are no differences between the varieties, it simply means differences cannot be determined at the 95% confidence level.

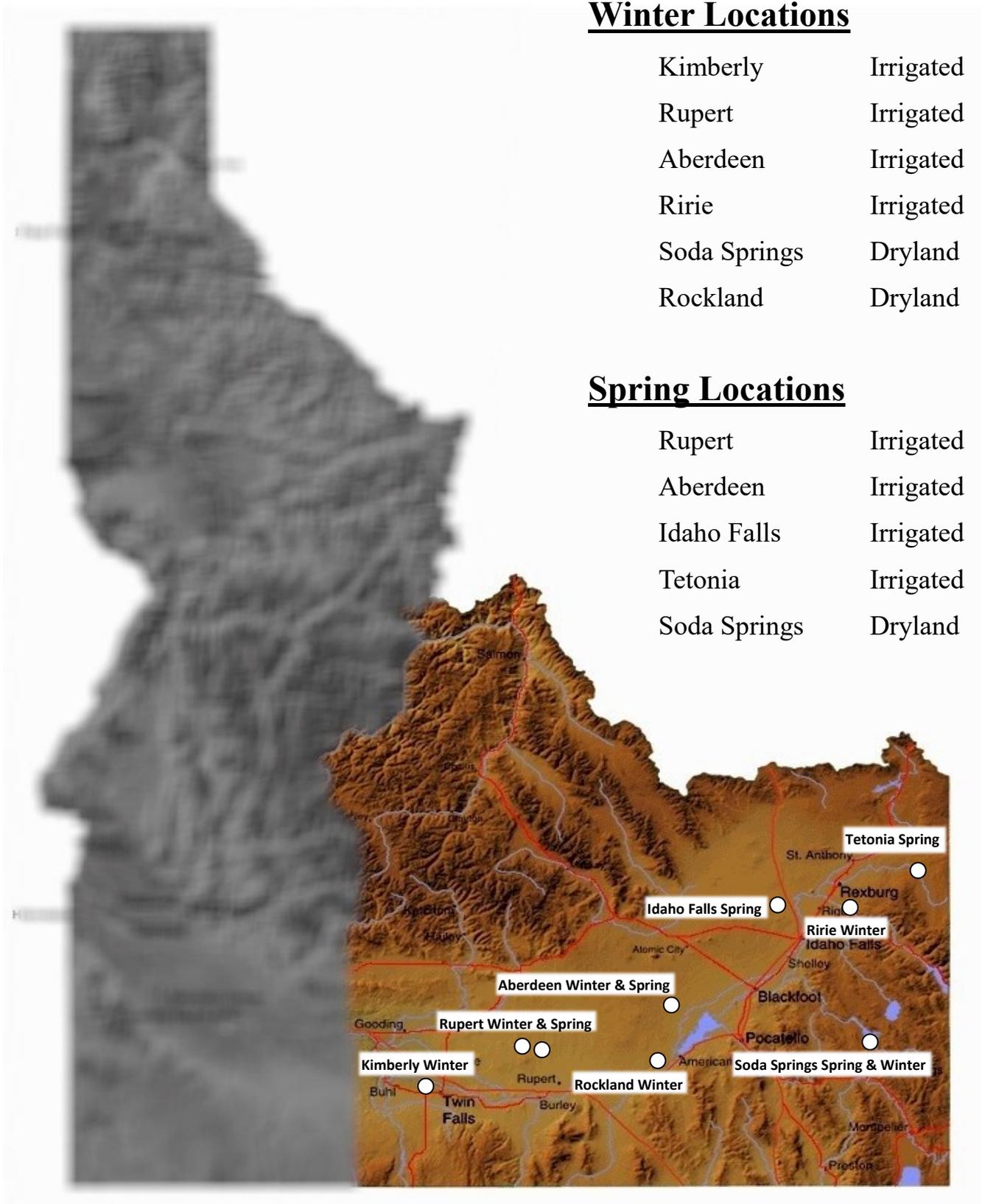
### **Released Varieties, Planting Rates & Sources**

A list of released varieties tested in 2022-2023 is given in Table 1. Included in this table are seed weight (thousand kernel weight), number of seeds per pound and the adjusted seeding rate. Information is also

given on the year of release and the releasing agency or company. A short description of selected varieties is given in Table 2. Additional information is available from the releasing agency or company.

Seasonal average measurements of several plant growth characteristics from the variety trials are shown in Table 3 for comparisons between averages from the previous ten years 2013-2022 in comparison to the current year - 2023.

# Southcentral & Southeast Idaho Cereal Variety Trial Locations



# Location Descriptions

## Kimberly Winter Irrigated:

Kimberly Research & Extension Center  
3825 N. 3600 E. Kimberly, ID

Coordinates: 42°33'06.87"N 114°20'34.46"W  
Elevation: 3894 ft.  
Soil Type: #10 Bahem silt loam, 1-4% slopes  
Previous Crop: Dry Beans  
Planting Date: October 11, 2022  
Harvest Date: August 15, 2023  
Chemicals applied: Huskie 15 oz./A, AxialStar 16 oz./A,

### Fertility:

|                                       | Organic Matter % | pH  | Free Lime % | Hard winter wheat N#/A | Soft white winter wheat N #/A | P      | K       | S       |
|---------------------------------------|------------------|-----|-------------|------------------------|-------------------------------|--------|---------|---------|
| 12" soil test results (N & S = 0-24") | 1.5              | 7.8 | 7.3         | 168                    | 168                           | 44 ppm | 302 ppm | 101 ppm |
| Fertilizer applied (lbs/A)            | -                | -   | -           | 390                    | 200                           | 150#   | 40#     | 30# S   |
| Total                                 | 1.5              | 7.8 | 7.3         | 558                    | 368                           | 150#   | 40#     | 30# S   |

## Rupert Winter Irrigated: Severe Winter Damage

Cooperator: Luke Adams  
Located at 800 N. 250 W. Rupert, Idaho

Coordinates: 42°44'14.71" N 113°42'51.83"W  
Elevation: 4262 ft.  
Soil Type:  
Previous Crop:  
Planting Date: September 28, 2022  
Harvest Dates: Trial was planted in WBA Field that had severe winter kill.  
Chemicals applied:

Rupert winter trials were plowed under and replanted to potatoes.

# Location Descriptions

## Aberdeen Winter Irrigated:

Aberdeen Research & Extension Center  
1693 S. 2700 W. Aberdeen, ID

**Coordinates:** 42°57'34.46"N, 112°49'18.49"W  
**Elevation:** 4405 ft.  
**Soil Type:** DeA Declo loam, 0-2% slopes  
**Previous Crop:** Green Manure Oats  
**Planting Date:** October 4, 2022  
**Harvest Dates:** August 24 & 25, 2023  
**Chemicals applied:** Huskie 15 oz./A, AxialStar 16 oz./A  
**Fertility:**

|                                      | Organic Matter % | pH  | Free Lime % | Hard winter wheat N#/A | Soft white winter wheat & winter barley N #/A | P      | K       | S                               |
|--------------------------------------|------------------|-----|-------------|------------------------|---|--------|---------|---------------------------------|
| 12" soil test results (N & S= 0-24") | 1.4              | 8.2 | 12.7        | 236                    | 236   | 51 ppm | 469 ppm | 43 ppm                          |
| Fertilizer applied (lbs/A)           | -                | -   | -           | 290                    | 175   | 55#    | -       | 100# elemental Sulfur + 20# SO4 |
| Total                                | 1.4              | 8.2 | 12.7        | 526                    | 411   | 55#    | 469 ppm | 20# S                           |

## Ririe Winter Irrigated:

Cooperator: Clark Hamilton  
Located at HWY 26 and 175 E, North of highway.

**Coordinates:** 43°36'57.90"N, 111°41'56.41"W  
**Elevation:** 5023 ft.  
**Soil Type:** #6 Bannock Loam  
**Previous Crop:** Peas  
**Planting Date:** September 26, 2022  
**Harvest Date:** August 17, 2023  
**Chemicals applied:** MCPA 12 oz, Affinity Broadspec 8 oz, AxialStar 16 oz./A

### Fertility:

|                                      | Organic Matter % | pH  | Free Lime % | Hard winter wheat N#/A | Soft white winter wheat N #/A | P      | K       | S      |
|--------------------------------------|------------------|-----|-------------|------------------------|-------------------------------|--------|---------|--------|
| 12" soil test results (N & S= 0-24") | 1.6              | 7.9 | 1.1         | 111                    | 111                           | 12 ppm | 243 ppm | 48 ppm |
| Fertilizer applied (lbs/A)           | -                | -   | -           | 190                    | 150                           | -      | -       | -      |
| Total                                | 1.6              | 7.9 | 1.1         | 301                    | 261                           | -      | -       | -      |

# Location Descriptions

## Rockland Winter Dryland:

**Cooperators: Cory Kress**

**14 miles south of Rockland, ID then 2 miles east on Richard Road.**

**Coordinates:** 42°23'08.23"N, 112°52'47.24"W  
**Elevation:** 5520 ft.  
**Soil Type:** #51 Newdale silt loam, 4-12% slopes  
**Previous Crop:** Garbonzo Beans  
**Planting Date:** September 20, 2022  
**Harvest Date:** August 11, 2023  
**Chemicals applied:** Clethodim 4 oz./ A

**Fertility:**

|                            | Organic Matter % | pH | Free Lime % | Winter wheat N#/A | P | K | S |
|----------------------------|------------------|----|-------------|-------------------|---|---|---|
| Fertilizer applied (lbs/A) | -                | -  | -           | -                 | - | - | - |

## Soda Springs Winter Dryland:

**Cooperator: Cody Cole**

**16 Miles North of Soda Springs on Government Dam Road, left side of the road.**

**Coordinates:** 42°51'39.75"N, 111°39'04.74"W  
**Elevation:** 6283 ft.  
**Soil Type:** 705AA Lostine – Foundem complex, 1 to 4% slopes  
**Previous Crop:** Fallow  
**Planting Date:** September 27, 2022  
**Harvest Date:** September 26, 2023  
**Chemicals applied:** Huskie 15 oz/A, Axial Star 16 oz/A

**Fertility:**

|                                      | Organic Matter % | pH  | Free Lime % | Winter wheat N#/A | P      | K       | S      |
|--------------------------------------|------------------|-----|-------------|-------------------|--------|---------|--------|
| 12" soil test results (N & S= 0-24") | 2.4              | 5.5 | <1.0        | 106               | 49 ppm | 408 ppm | 21 ppm |
| Fertilizer applied (lbs/A)           | -                | -   | -           | -                 | -      | -       | -      |
| Total                                | 2.4              | 5.5 | <1.0        | -                 | -      | -       | -      |

# Location Descriptions

## Ririe Winter Dryland:

**Cooperator: Trevor Davey**

**6 miles south of HWY 26 past Ririe Reservoir on right side of road.**

**Coordinates:** 43°31'52.33"N, 111°41'07.63"W  
**Elevation:** 5702 ft.  
**Soil Type:** #42 Ririe Silt Loam, 4 to 12% slopes.  
**Previous Crop:** Fallow  
**Planting Date:** September 26, 2022  
**Harvest Date:** August 18, 2023  
**Chemicals applied:** Talinor 18.2 oz./A, Rifle 3.6 oz./A

### Fertility:

|                                      | Organic Matter % | pH  | Free Lime % | Hard winter wheat N#/A | Soft white winter wheat N #/A | P      | K       | S      |
|--------------------------------------|------------------|-----|-------------|------------------------|-------------------------------|--------|---------|--------|
| 12" soil test results (N & S= 0-24") | 1.4              | 7.2 | 1.0         | 62                     | 62                            | 10 ppm | 394 ppm | 18 ppm |
| Fertilizer applied (lbs/A)           | -                | -   | -           | -                      | -                             | -      | -       | -      |
| Total                                | 1.4              | 7.0 | 1.0         | 62                     | 62                            | -      | -       | -      |

# Location Descriptions

## Rupert Spring Irrigated:

Cooperator: Taylor Grant, Grant 4-D Farms  
600 N Meridian, Rupert, ID

Coordinates: 42°42'23.78"N, 113°40'07.00"W  
Elevation: 4209 ft.  
Soil Type: #24 Portneuf silt loam, 1-4% slopes  
Previous Crop: Sugar Beets  
Planting Date: April 24, 2023  
Harvest Dates: August 23, 2023  
Chemicals applied: Huskie 15 oz/A, AxialStar 16 oz./A,  
Fertility:

|                                      | Organic Matter% | pH  | Free Lime % | Hard Spring wheat N#/A | Soft white spring wheat & spring barley N #/A | P      | K       | S      |
|--------------------------------------|-----------------|-----|-------------|------------------------|---|--------|---------|--------|
| 12" soil test results (N & S= 0-24") | 1.3             | 8.0 | 7.8         | 166                    | 166   | 40 ppm | 164 ppm | 77 ppm |
| Fertilizer applied (lbs/A)           | -               | -   | -           | 206                    | 166   | -      | -       | -      |
| Total                                | 1.3             | 8.0 | 7.8         | 376                    | 296   | -      | -       | -      |

## Aberdeen Spring Irrigated:

Aberdeen Research & Extension Center  
1693 S. 2700 W., Aberdeen, ID

Coordinates: 42°57'31.84"N, 112°49'17.02"W  
Elevation: 4405 ft.  
Soil Type: DeA Declo loam, 0-2% slopes  
Previous Crop: Green Manure Oats  
Planting Date: April 21, 2023  
Harvest Date: August 29 & 31, 2022  
Chemicals applied: Brox M 16 oz./A, Stave 6 oz./A,  
Fertility:

|                                      | Organic Matter% | pH  | Free Lime % | Hard Spring wheat N#/A | Soft white spring wheat & spring barley N #/A | P      | K       | S                                  |
|--------------------------------------|-----------------|-----|-------------|------------------------|---|--------|---------|------------------------------------|
| 12" soil test results (N & S= 0-24") | 1.5             | 8.2 | 13.9        | 172                    | 172   | 39 ppm | 386 ppm | 50 ppm                             |
| Fertilizer applied (lbs/A)           | -               | -   | -           | 140                    | 100   | 70     | -       | 20# SO <sub>4</sub><br>100 Elem. S |
| Total                                | 1.5             | 8.2 | 13.9        | 312                    | 272   | 70     | -       | 20#SO <sub>4</sub>                 |

# Location Descriptions

## Idaho Falls Spring Irrigated:

Cooperator: Marc Thiel  
Approximately 25 S. on 45<sup>th</sup> West Idaho Falls, ID

**Coordinates:** 43°28'20.19"N, 112°7' 09.06"W  
**Elevation:** 4689 ft.  
**Soil Type:** #22 Pancheri silt loam, 0-2% slopes  
**Previous Crop:** Potatoes  
**Planting Date:** May 4, 2023  
**Harvest Date:** August 30, 2023  
**Chemicals applied:** Huskie 15 oz/A, AxialStar 16 oz./A.  
**Fertility:** Wheat Field

|                                      | Organic Matter% | pH  | Free Lime % | Hard Spring wheat N#/A | Soft white spring wheat N #/A | P      | K       | S      |
|--------------------------------------|-----------------|-----|-------------|------------------------|-------------------------------|--------|---------|--------|
| 12" soil test results (N & S= 0-24") | 1.9             | 7.6 | 1.8         | 165                    | 165                           | 38 ppm | 316 ppm | 48 ppm |
| Fertilizer applied (lbs/A)           | -               | -   | -           | 90                     | 50                            | #      |         |        |
| Total                                | 1.9             | 7.6 | 1.8         | 255                    | 215                           | -      | -       | -      |

## Tetonia Spring Irrigated:

Tetonia Research and Extension Center  
888 West Hwy 33 Newdale, Idaho

**Coordinates:** 43°51'31.55"N, 111°16'39.34"W  
**Elevation:** 6181 ft.  
**Soil Type:** #13517 Kucera–Ririe complex, 0–4% slopes  
**Previous Crop:** Fallow  
**Planting Date:** May 17, 2023  
**Harvest Date:** September 13 & 19, 2023  
**Chemical applied:** Huskie 15 oz/A, AxialStar 16 oz./A  
**Fertility:**

|                                      | Organic Matter% | pH  | Free Lime % | Hard Spring wheat N#/A | Soft white spring wheat & spring barley N #/A | P      | K       | S      |
|--------------------------------------|-----------------|-----|-------------|------------------------|---|--------|---------|--------|
| 12" soil test results (N & S= 0-24") | 1.7             | 7.1 | <1.0        | 166                    | 166   | 36 ppm | 460 ppm | 36 ppm |
| Fertilizer applied (lbs/A)           | -               | -   | -           | 130                    | 90  | -      | 40      | -      |
| Total                                | 1.7             | 7.1 | <1.0        | 296                    | 256   |        | 40      | -      |

## Location Descriptions

### Soda Springs Spring Dryland:

**Cooperators: Kyle Wangemann and Scott Brown**

6 Miles north of Soda Springs on Gov. Dam Rd, east 2 miles to Dekay Rd., north 1 mile. Plots on left.

**Coordinates:** 42°45'41.87"N 111°36'13.54"W  
**Elevation:** 6067 ft.  
**Soil Type:** 485 AA Foundem – Rexburg, very deep complex 1 to 4 % slopes  
**Previous Crop:** Spring Barley  
**Planting Date:** May 19, 2023  
**Harvest Date:** September 8, 2023  
**Chemicals applied:** Huskie 12 oz/A, Axial Bold 15oz/A, Starane Ultra 6 oz./A

#### Fertility:

|                                      | Organic Matter% | pH | Free Lime % | Hard Spring wheat N#/A | Soft white spring wheat N #/A | P   | K | S   |
|--------------------------------------|-----------------|----|-------------|------------------------|-------------------------------|-----|---|-----|
| 12" soil test results (N & S= 0-24") | -               | -  | -           | NA                     | NA                            | -   | - | -   |
| Fertilizer applied (lbs/A)           | 6# Zn           | -  | -           | 50                     | 50                            | 25# | - | 20# |
| Total                                |                 | -  | -           | 50                     | 50                            | 25# | - | 20# |

**Temperature and irrigation/precipitation totals for all locations, recorded with on-site weather stations provided with financial support from the Idaho Wheat Commission.**

| Variety Trial Site  | Dates of station recording range | Maximum temperature °F | Minimum temperature °F | # of days above 90°F | # of days below 50°F | # of days below 40°F | Spring & Summer Precipitation and Irrigation |
|---------------------|----------------------------------|------------------------|------------------------|----------------------|----------------------|----------------------|--|
| Kimberly            | May 3 - August 15, 2023          | 106                    | 32                     | 29                   | 55                   | 10                   | -  |
| Ririe Irrig.        | June 16 - August 17, 2023        | 103                    | 33                     | 19                   | 28                   | 3                    | 8.1  |
| Ririe Dryland       | June 16 - August 18, 2023        | 103                    | 29                     | 22                   | 33                   | 4                    | .87  |
| Soda Springs Winter | June 22 – Sept. 26, 2023         | 93                     | 26                     | 7                    | 100                  | 26                   | 3.77   |
| Rupert spring       | June 12 - August 23, 2023        | 102                    | 33                     | 34                   | 39                   | 3                    | 12.4   |
| Idaho Falls         | June 5 - August 30, 2023         | 104                    | 30                     | 26                   | 59                   | 6                    | 10.9   |
| Aberdeen            | June 14 - September 1, 2023      | 100                    | 32                     | 23                   | 43                   | 3                    | 12.3   |
| Soda Springs Spring | June 26 - September 8, 2023      | 96                     | 30                     | 16                   | 58                   | 5                    | 3.2  |

**Table 1. Released varieties tested in 2022-2023 with seed size and adjusted seeding rate.**

| Variety                                    | Exp. No.        | 1000<br>Kernel<br>Weight (g) | Seeds<br>per<br>Pound | Adjusted<br>Seeding<br>Rate <sup>1</sup> (lb/A) | Year<br>Released | Developer(s)/Distributor of variety     |
|--|-----------------|------------------------------|-----------------------|---|------------------|---|
| <b>Soft White Winter Wheat</b>             |                 |                              |                       |   |                  |   |
| AP Exceed                                  | 11PN039#20      | 40                           | 11,340                | 88  | 2020             | AgriPro /Syngenta Cereals               |
| AP Iliad                                   | 11PN044#84      | 50                           | 9,072                 | 110   | 2020             | AgriPro /Syngenta Cereals               |
| Appleby CL+                                | ORI2161250CL+   | 42                           | 10800                 | 93  | 2019             | Oregon State AES                        |
| Devote                                     | WA8271          | 24                           | 18,900                | 53  | 2019             | Washington AES, USDA                    |
| Eltan                                      | WA7431          | 42                           | 10,800                | 93  | 1990             | Washington AES, USDA                    |
| LCS Blackjack                              | LWW15-71945     | 40                           | 11,340                | 88  | 2019             | Limagrain Cereal Seeds, LLC             |
| LCS Hulk                                   | LWW14-73163     | 42                           | 10,800                | 93  | 2017             | Limagrain Cereal Seeds, LLC             |
| Norwest Duet                               | LOR-092         | 39                           | 11,631                | 86  | 2015             | OSU /Limagrain Cereal Seeds, LLC        |
| Norwest Tandem                             | LOR-334         | 42                           | 10,800                | 93  | 2016             | OSU /Limagrain Cereal Seeds, LLC        |
| Otto                                       | WA008092        | 47                           | 9,651                 | 104   | 2011             | Washington AES, USDA                    |
| Piranha CL+                                | WA8305          | 31                           | 14,632                | 68  | 2020             | Washington AES, USDA                    |
| Sockeye CL+                                | WA8306          | 34                           | 13,341                | 75  | 2020             | Washington AES, USDA                    |
| Stephens                                   | OR65-116        | 44                           | 10309                 | 97  | 1977             | Oregon AES                              |
| Stingray CL+                               | WA8275CL+       | 36                           | 12,600                | 79  | 2019             | Washington AES, USDA                    |
| SY Assure                                  | 04PN096-2       | 48                           | 9,450                 | 106   | 2016             | AgriPro /Syngenta Cereals               |
| SY Ovation                                 | 03PN108#21      | 50                           | 9,072                 | 110   | 2011             | AgriPro /Syngenta Cereals               |
| TMC M-Pire                                 | TMC2021SWW      | 50                           | 9,072                 | 110   | 2020             | Yield Star Cereals                      |
| UI Magic CL+                               | IDN 09-DH11     | 34                           | 13,341                | 75  | 2015             | Idaho AES / Limagrain Cereal Seeds      |
| UI Sparrow                                 | IDO1108DH       | 38                           | 11,937                | 84  | 2016             | Idaho AES                               |
| VI Presto CL+                              | UIL17-6451CL+   | 36                           | 12600                 | 79  | 2020             | Idaho AES / Limagrain Cereal Seeds, LLC |
| VI Shock                                   | UIL15-72223     | 40                           | 11,340                | 88  | 2020             | Idaho AES / Limagrain Cereal Seeds, LLC |
| VI Voodoo CL+                              | UIL17-6268CL+   | 44                           | 10,309                | 97  | 2020             | Idaho AES / Limagrain Cereal Seeds, LLC |
| WB 456                                     | BU6W99-456      | 38                           | 11,937                | 84  | 2009             | Bayer Crop Science / WestBred           |
| WB1376CLP                                  | BZ6WM09-1030CLP | 40                           | 11,340                | 88  | 2014             | Bayer Crop Science / WestBred           |
| WB1529                                     | BZ6W07-436      | 47                           | 9,651                 | 104   | 2013             | Bayer Crop Science / WestBred           |
| WB1621                                     | XE1304          | 43                           | 10,573                | 95  | 2021             | Bayer Crop Science / WestBred           |
| WB1783                                     | BZ6W09-471      | 48                           | 9450                  | 106   | 2016             | Bayer Crop Science / WestBred           |
| <b>Hard Red and White (W) Winter Wheat</b> |                 |                              |                       |   |                  |   |
| Balance                                    | WA8248          | 40                           | 11,340                | 88  | 2020             | Nutrien Ag                              |
| Flathead                                   | MT1564          | 44                           | 10,309                | 97  | 2019             | Montana AES                             |
| FourOSix                                   | MT1462          | 40                           | 11340                 | 88  | 2018             | Montana AES                             |
| Golden Spike (W)                           | UT1944-158      | 46                           | 9,861                 | 101   | 1999             | Utah AES, USDA                          |
| Irv (W)                                    | OR2110679       | 36                           | 12,600                | 79  | 2018             | Oregon AES                              |
| Juniper                                    | IDO 575         | 42                           | 10,800                | 93  | 2005             | Idaho AES, USDA                         |
| Kairos                                     | T44             | 42                           | 10,800                | 93  | 2021             | Highland Specialty Grains               |
| Keldin                                     | ACS55017        | 56                           | 8,100                 | 123   | 2011             | Bayer Crop Science / WestBred           |
| LCS Jet                                    | NSA 7208        | 41                           | 11,063                | 90  | 2015             | Limagrain Cereal Seeds, LLC             |
| LCS Rocket                                 | NSA10-2196      | 50                           | 9072                  | 110   | 2018             | Limagrain Cereal Seeds, LLC             |
| Milestone                                  | ACS14132-412    | 40                           | 11,340                | 88  | 2020             | Nutrien Ag                              |
| Millie (W)                                 | OR2130118H      | 35                           | 12,960                | 77  | 2021             | Oregon State AES                        |
| MT Warcat                                  | MTS18149        | 30                           | 15,120                | 66  | 2022             | Montana AES                             |
| NuMont                                     | MT1491          | 36                           | 12,600                | 79  | 2023             | Montana AES                             |
| Promontory                                 | UT1567-51       | 42                           | 10,800                | 93  | 1990             | Utah AES, USDA                          |
| Scorpio                                    | WA8268          | 38                           | 11,937                | 84  | 2019             | Washington AES, USDA                    |
| Sequoia                                    | WA8180          | 50                           | 9,072                 | 110   | 2015             | Washington AES, USDA                    |
| UI Bronze Jade (W)                         | IDO1706         | 36                           | 12600                 | 79  | 2019             | Idaho AES                               |
| UI Silver (W)                              | IDO658B         | 40                           | 11,340                | 88  | 2011             | Idaho AES, USDA                         |
| UI SRG                                     | IDO656          | 48                           | 9,450                 | 106   | 2012             | Idaho AES, USDA                         |
| Utah 100                                   |                 | 27                           | 16,800                | 60  | 1997             | Utah AES, USDA                          |
| WB4303                                     |                 | 37                           | 12,259                | 82  | 2015             | Bayer Crop Science / WestBred           |
| WB4401                                     | XC4109          | 40                           | 11,340                | 88  | 2019             | Bayer Crop Science / WestBred           |
| WB4510CLP                                  | XD4201          | 43                           | 10,549                | 95  | 2017             | Bayer Crop Science / WestBred           |
| Yellowstone                                | MT00159         | 19                           | 24,519                | 41  | 2005             | Montana AES                             |

<sup>1</sup>Adjusted to plant 1 million seeds per acre under irrigation according to the number of seeds per pound for each variety.

**Table 1 (cont'd). Released varieties tested in 2022-2023 with seed size and adjusted seeding rate.**

| Variety                        | Exp. No.     | 1000<br>Kernel<br>Weight (g) | Seeds<br>per<br>Pound | Adjusted<br>Seeding<br>Rate <sup>1</sup> (lb/A) | Year<br>Released | Developer(s)/Distributor of variety         |
|--------------------------------|--------------|------------------------------|-----------------------|---|------------------|---|
| <b>Soft White Spring Wheat</b> |              |                              |                       |   |                  |   |
| Alturas                        | IDO526       | 35                           | 12,960                | 77  | 2002             | Idaho AES, USDA                             |
| AP Coachman                    | 08PN2001-07  | 45                           | 10,193                | 98  | 2020             | AgriPro / Syngenta Cereals                  |
| Butch CL+                      | WA8354CL+    | 31                           | 14,632                | 68  | 2023             | Washington AES, USDA                        |
| Hedge CL+ (club wheat)         | WA8295 CL+   | 44                           | 10,428                | 96  | 2020             | Washington AES, USDA                        |
| Louise                         | WA7921       | 42                           | 10,930                | 91  | 2004             | Washington AES, USDA                        |
| Melba (club wheat)             | WA8193       | 29                           | 15,916                | 63  | 2016             | Washington AES, USDA                        |
| Roger (club wheat)             | WA8235       | 41                           | 11,200                | 89  | 2022             | Washington AES, USDA                        |
| Ryan                           | WA8214       | 37                           | 12,259                | 82  | 2016             | Washington AES, USDA                        |
| Seahawk                        | WA8162       | 30                           | 15,376                | 65  | 2015             | Washington AES, USDA                        |
| Tekoa                          | WA8189       | 30                           | 15,376                | 65  | 2016             | Washington AES, USDA                        |
| UI Cookie                      | IDO1405S     | 36                           | 12,600                | 79  | 2019             | Idaho AES, USDA                             |
| UI Stone                       | IDO599       | 38                           | 12,096                | 83  | 2012             | Idaho AES / Limagrain Cereal Seeds          |
| WB6211CLP                      | XD6305       | 46                           | 9,969                 | 100   | 2020             | Bayer Crop Science / WestBred               |
| WB6430                         | BZ608-125    | 36                           | 12,600                | 79  | 2013             | Bayer Crop Science / WestBred               |
| <b>Hard Red Spring Wheat</b>   |              |                              |                       |   |                  |   |
| Alum                           | WA8166       | 39                           | 11,631                | 86  | 2015             | Washington AES, USDA                        |
| AP Venom                       |              | 31                           | 14,632                | 68  | 2018             | AgriPro / Syngenta Cereals                  |
| Choteau                        | MT9920       | 35                           | 12,960                | 77  | 2003             | Montana AES                                 |
| Dagmar                         | MT1621       | 35                           | 12,960                | 77  | 2019             | Montana AES                                 |
| Duclair                        | MT0832       | 35                           | 13,148                | 76  | 2011             | Montana AES                                 |
| Expresso                       | DA984-034SRR | 33                           | 13,957                | 72  | 2006             | Bayer Crop Science / WestBred               |
| Glee                           | WA8074       | 35                           | 12,960                | 77  | 2012             | Washington AES, USDA                        |
| Hale                           | WA8315       | 44                           | 10,428                | 96  | 2023             | Washington AES, USDA                        |
| Holmes                         | BZ917-221    | 28                           | 16,495                | 61  | 2023             | Nutrien Ag Solutions                        |
| Jefferson HF                   | IDO462       | 36                           | 12,600                | 79  | 2020             | Idaho AES, USDA                             |
| LCS Hammer AX                  |              | 36                           | 12,777                | 78  | 2022             | Limagrain Cereal Seeds, LLC                 |
| Net CL+                        | WA8280 CL+   | 41                           | 11,200                | 89  | 2019             | Washington AES, USDA                        |
| Rocker                         | BZ917-277    | 25                           | 18,144                | 55  | 2020             | Nutrien Ag                                  |
| SY Gunsight                    | 06PN3015-08  | 39                           | 11,782                | 85  | 2017             | AgriPro / Syngenta Cereals                  |
| WB9668                         | BZ908-552    | 36                           | 12,600                | 79  | 2013             | Bayer Crop Science / WestBred               |
| WB9707                         | XC9304       | 48                           | 9,549                 | 105   | 2019             | Bayer Crop Science / WestBred               |
| WB9724CLP                      | XD9315       | 38                           | 12096                 | 83  | 2021             | Bayer Crop Science / WestBred               |
| WB9879CLP                      | IMICHT79     | 43                           | 10,549                | 95  | 2011             | Bayer Crop Science / WestBred               |
| <b>Hard White Spring Wheat</b> |              |                              |                       |   |                  |   |
| Dayn                           | WA8123       | 41                           | 11,063                | 90  | 2012             | Washington AES / AgriPro / Syngenta Cereals |
| SY Teton                       | SY10136      | 43                           | 10,673                | 94  | 2015             | AgriPro / Syngenta Cereals                  |
| UI Gold                        | IDO1804S     | 33                           | 13,745                | 73  | 2022             | Idaho AES                                   |
| UI Platinum                    | IDO694C      | 77                           | 5,891                 | 170   | 2014             | Idaho AES, Anderson Group                   |
| WB7202CLP                      | XA7320       | 44                           | 10,428                | 96  | 2017             | Bayer Crop Science / WestBred               |
| WB7313                         | XD9201       | 48                           | 9,549                 | 105   | 2020             | Bayer Crop Science / WestBred               |
| WB7589                         | BZ9S09-0735W | 43                           | 10,549                | 95  | 2014             | Bayer Crop Science / WestBred               |
| WB7696                         | XB9512       | 36                           | 12,777                | 78  | 2018             | Bayer Crop Science / WestBred               |

<sup>1</sup>Adjusted to plant 1 million seeds per acre for wheat under irrigation according to the number of seeds per pound for each variety.

**Table 1 (cont'd). Released varieties tested in 2023 with seed size and adjusted seeding rate.**

| Usage: Variety               |                         | Exp. No.            | 1000<br>Kernel<br>Weight (g) | Seeds<br>per<br>Pound | Adjusted<br>Seeding<br>Rate <sup>1</sup> (lb/A) | Year<br>Released | Developer(s)/Distributor of variety                |
|------------------------------|-------------------------|---------------------|------------------------------|-----------------------|---|------------------|--|
| <b>Winter Barley - malt</b>  |                         |                     |                              |                       |   |                  |  |
| Malt                         | Avalon                  | VA16M-81            | 50                           | 9,072                 | 88  | 2020             | Virginia Tech                                      |
| Malt                         | BC Clementine           |                     | 56                           | 8,100                 | 99  |                  | Limagrain Cereal Seeds, LLC                        |
| Malt                         | BC Fay                  |                     | 54                           | 8,400                 | 95  |                  | Limagrain Cereal Seeds, LLC                        |
| Malt                         | Charles                 | 94Ab1274            | 44                           | 10,309                | 78  | 2005             | USDA-ARS, Aberdeen                                 |
| Malt                         | Endeavor                | 95Ab2299            | 44                           | 10,309                | 78  | 2008             | Idaho AES, USDA                                    |
| Malt                         | Flavia                  |                     | 50                           | 9,072                 | 88  |                  | Ackermann Saatzucht / Virginia Tech                |
| Malt                         | Hirondella              |                     | 46                           | 9,861                 | 81  |                  | Ackermann Saatzucht / Virginia Tech                |
| Malt                         | KWS Donau               |                     | 51                           | 8,982                 | 89  |                  | KWS Cereals  |
| Malt                         | LCS Calypso             |                     | 57                           | 7,958                 | 101   | 2017             | Limagrain Cereal Seeds, LLC                        |
| Malt                         | Lightning               |                     | 54                           | 8,400                 | 95  |                  |  |
| Malt                         | Marouetta               |                     | 44                           | 10,309                | 78  |                  | Ackermann Saatzucht / Virginia Tech                |
| Malt                         | Thunder                 | 10.0777             | 42                           | 10,800                | 74  | 2016             | Oregon AES, USDA                                   |
| Malt                         | Wintmalt                |                     | 48                           | 9,450                 | 85  | 2014             | KWS Lochow   |
| Feed                         | Eight-Twelve            | 79Ab812             | 38                           | 11,937                | 67  | 1988             | Idaho AES, USDA                                    |
| Feed                         | Sunstar Pride           | SDM204-B            | 33                           | 13,745                | 58  | 1995             | Sunderman Breeding, Twin Falls, ID                 |
| Food                         | Upspring <sup>2</sup>   | 05ARS748-270        | 44                           | 10,309                | 78  | 2018             | Idaho AES, USDA                                    |
| <b>Two-Row Spring Barley</b> |                         |                     |                              |                       |   |                  |  |
| Feed                         | Altorado                | BZ509-601           | 50                           | 9,164                 | 87  | 2016             | Highland Specialty Grains                          |
| Feed                         | Carleton                | HO517-245           | 48                           | 9,450                 | 85  | 2023             | Highland Specialty Grains                          |
| Feed                         | Champion                | YU501-385           | 47                           | 9,755                 | 82  | 2007             | Highland Specialty Grains                          |
| Feed                         | Claymore                | BZ509-216           | 49                           | 9,353                 | 86  | 2015             | Highland Specialty Grains                          |
| Feed                         | Diamondback (SB6)       | YU510-559d          | 44                           | 10,428                | 77  | 2020             | Highland Specialty Grains                          |
| Food                         | Goldenhart <sup>2</sup> | 2Ab09-X06F058HL-31  | 40                           | 11,340                | 71  | 2018             | Idaho AES, USDA                                    |
| Feed                         | Idagold II              | C32                 | 44                           | 10,309                | 78  | 2002             | Molson Coors Beverage Company                      |
| Food                         | Julie <sup>2</sup>      | 03AH6561-94         | 44                           | 10,428                | 77  | 2010             | Idaho AES, USDA                                    |
| Food                         | Kardia                  | 2Ab09-X06F084-51    | 48                           | 9,549                 | 84  | 2016             | Idaho AES, USDA                                    |
| Feed                         | Oreana                  | BZ509-448           | 42                           | 10,930                | 73  | 2015             | Highland Specialty Grains                          |
| Food                         | Transit <sup>2</sup>    | 03AH3054-51         | 42                           | 10,930                | 73  | 2010             | Idaho AES, USDA                                    |
| Malt                         | AAC Prairie             | TR17255             | 44                           | 10,309                | 78  | 2022             | Canterra Seeds                                     |
| Malt                         | ABI Eagle               | 2B11-4949           | 43                           | 10,673                | 75  | 2018             | Busch Agricultural Resources, LLC, Ft. Collins, CO |
| Malt                         | ABI Raptor              | 2IM14-8212          | 40                           | 11,484                | 70  | 2022             | Busch Agricultural Resources, LLC, Ft. Collins, CO |
| Malt                         | ABI Voyager             | 2B03-B3719, TR09402 | 47                           | 9,755                 | 82  | 2011             | Busch Agricultural Resources, LLC, Ft. Collins, CO |
| Malt                         | AC Metcalfe             | TR232               | 44                           | 10,428                | 77  | 1994             | Agriculture Canada                                 |
| Malt                         | BC Leandra              |                     | 42                           | 10,800                | 74  |                  | Limagrain Cereal Seeds, LLC                        |
| Malt                         | BC Lexy                 |                     | 44                           | 10,428                | 77  |                  | Limagrain Cereal Seeds, LLC                        |
| Malt                         | CDC Copeland            | TR150               | 45                           | 10,193                | 78  | 1999             | CDC University of Saskatchewan/ SeCan              |
| Malt                         | Conrad                  | B5057               | 47                           | 9,755                 | 82  | 2004             | Busch Agricultural Resources, LLC, Ft. Collins, CO |
| Malt                         | Esmá                    |                     | 48                           | 9,450                 | 85  |                  | Ackermann Saatzucht GmbH & Co. KG                  |
| Malt                         | GemCraft                | 2Ab08-X05M010-65    | 41                           | 11,200                | 71  | 2018             | USDA ARS, Idaho AES                                |
| Malt                         | LCS Diablob             |                     | 43                           | 10,549                | 76  |                  | KWS Lochow   |
| Malt                         | LCS Genie               |                     | 45                           | 10,193                | 78  | 2011             | Limagrain Cereal Seeds, LLC                        |
| Malt                         | LCS Odyssey             | NSL08-4556-A        | 45                           | 10,080                | 79  | 2015             | Limagrain Cereal Seeds, LLC                        |
| Malt                         | Merit 57                | 2B99-2657           | 42                           | 10,800                | 74  | 2009             | Busch Agricultural Resources, LLC, Ft. Collins, CO |
| Malt                         | Moravian 69             | C69                 | 42                           | 10,930                | 73  | 2005             | Molson Coors Beverage Company                      |
| Malt                         | Moravian 179            | C10-116-201         | 44                           | 10,428                | 77  | 2019             | Molson Coors Beverage Company                      |

<sup>1</sup>Adjusted to plant 800,000 seeds per acre under irrigation according to the number of seeds per pound for each variety.<sup>2</sup> Hullless

## RESULTS AND DISCUSSION

### Planting Conditions

The fall of 2022 was dry and grain fields had to be irrigated prior to planting or shortly after for good germination and stand establishment. Late September / early October rains provided excellent conditions for fall seeded crops (Chart 1a). Dryland plots emerged well and were well-established prior to winter, unlike in 2021 when seedlings in some areas emerged the following spring. Subsoil moisture was much improved over the previous years.

Spring planting conditions were generally good for stand establishment of spring grain, and moisture was average to very good depending on location. A very cool and extended spring with higher-than-average rain resulted in delayed planting and

emergence. Upper elevation spring grain emergence was delayed similar to but not as much as spring conditions in 2022. Rain and snow in May delayed planting. Slow melt of snow and additional snow and rain delayed planting in upper elevation spring production areas.

### Weather Conditions

The fall of 2022 was long and warm, resulting in a higher accumulation of growing degree days than average (see Chart 1c). Consistently cold temperatures in fall and winter resulted in snow cover lasting over 6 months in the higher elevation areas and extensive winter kill occurred throughout the Snake River Plain, damaging plant stands of both winter wheat and winter barley. Drier than average conditions continued from 2020, with annual growing year precipitation recorded as 7.20 inches, but improved over 2022 (5.85 inches) and

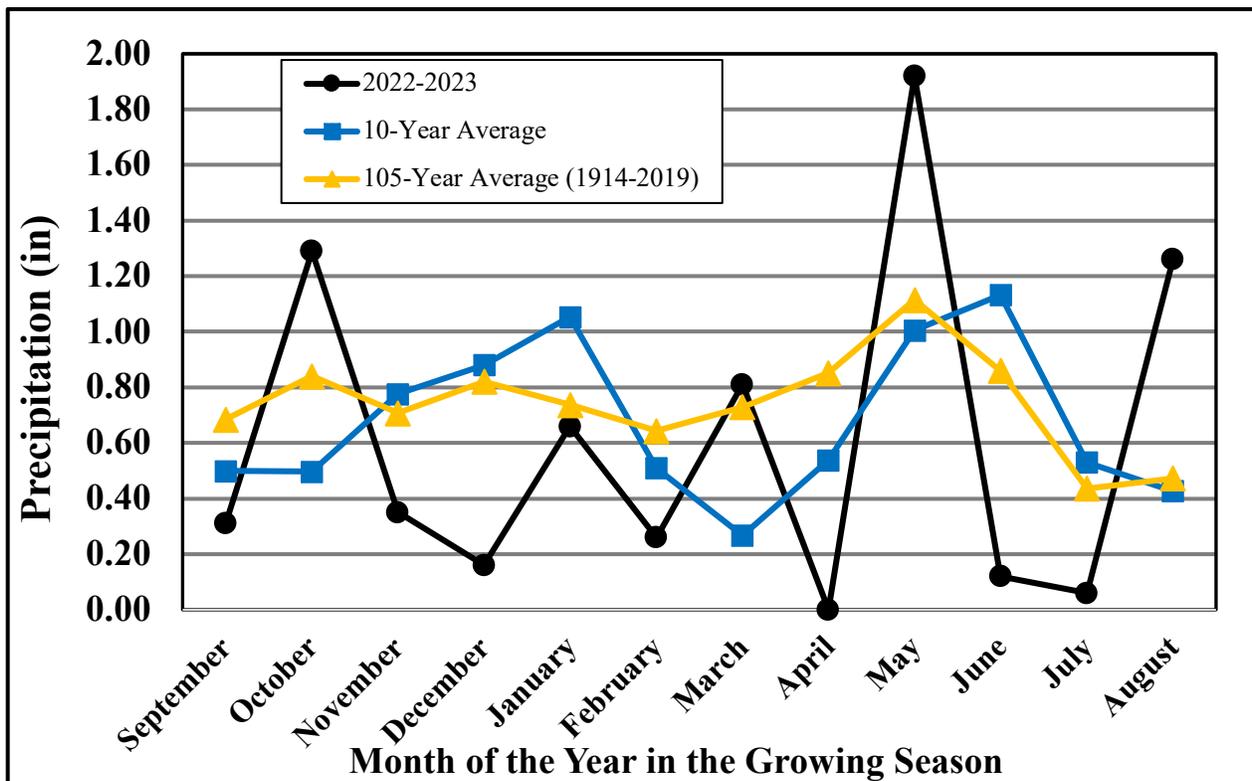


Chart 1a. 2022-2023 growing year precipitation recorded at Aberdeen, ID, versus 10-year (2012-2022) and 105-year (1914-2019) averages. Source: NWS & Agrimet data.

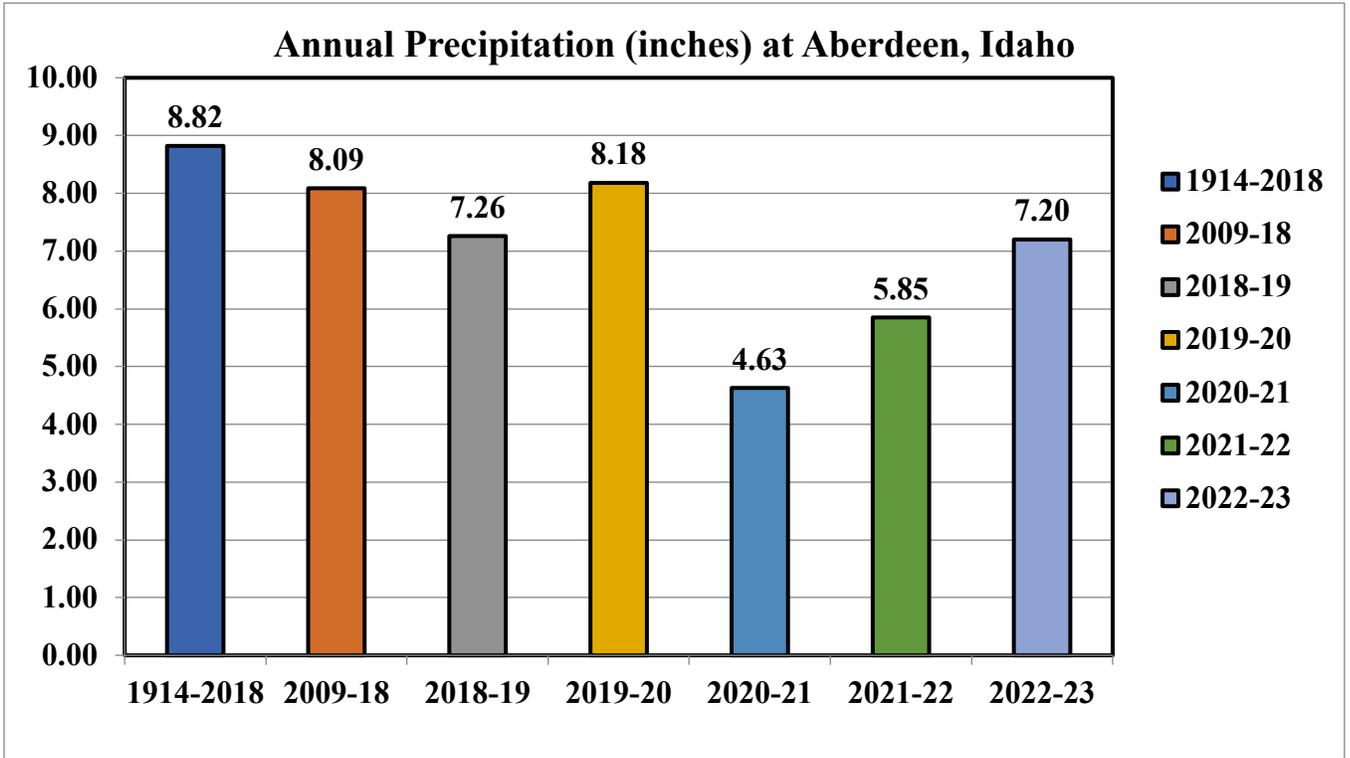


Chart 1b. Growing year precipitation data recorded at Aberdeen, ID for the previous five years, versus 9-years (2009-2018) and 30-year (1971-2000) and 102-year averages. Source: Agrimet data.

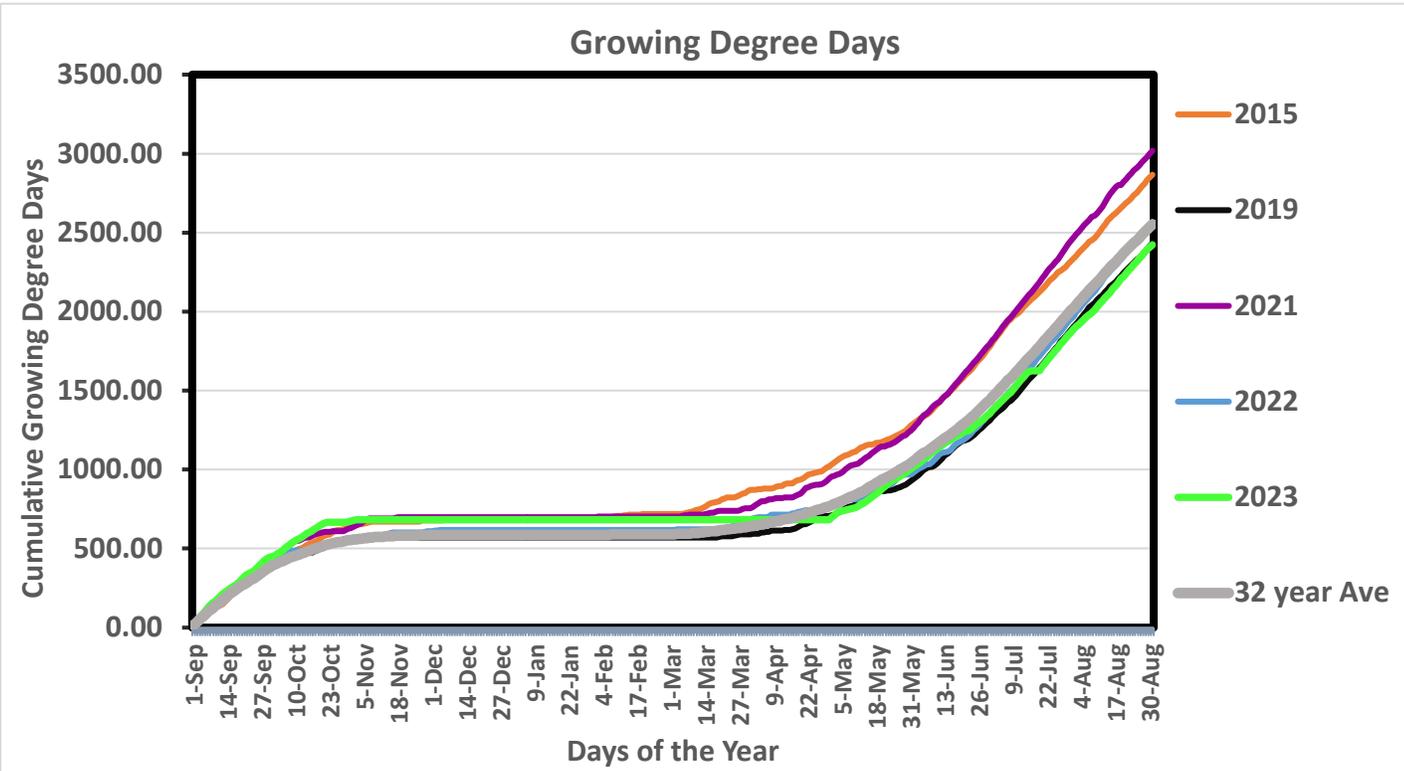


Chart 1c. Growing degree-day data recorded at Aberdeen, ID, in 2023 versus 2015, 2019, 2021, 2022 and 31-year averages. Source: Agrimet data.

2021 (4.63 inches Chart 1b). Spring temperatures were very low through May when temperatures exceeded average and continued higher than normal through the summer. The accumulated growing degree days caught up to the average in June, then were slightly lower again through August (Figure 1c).

Heading dates of winter wheat were 6 days later than the average of the previous ten years (see Table 3, page 63). Similarly, in 2022, winter wheat heading dates were 8 days later than the previous 10-year average. Spring wheat heading dates were delayed less than the winter crop and were 4 days later than the average of the previous ten years.

Spring barley heading dates were also delayed by 9 days from the average for the previous 10 years (Table 3). In 2022, spring barley heading dates were 6 days later than the previous ten years. Overall consistent temperatures during heading resulted in good grain fill conditions for barley and high test weights, yield and overall quality. Test weights were reduced in these trials however due to late season rains.

The delayed maturity of both winter and spring crops pushed harvest later into the monsoonal moisture patterns of late summer, resulting in additional harvest delays and sprout damaged crops. Approximately 60% of the commercial barley crop had some sprout damage, averaging less than 10% sprout. Natural precipitation was below the 10-year and 105-year averages in almost every month except October, March, May and August. Above average precipitation in August (Chart 1a) resulted in sprout damage at many locations. The results of falling number tests can be found on the cereals website. See the following website:

<https://www.uidaho.edu/extension/cereals/scseidaho>

Over all locations (Table 3), yields were at above the 10-year average for winter wheat, even with winter kill and poor stands in the spring. For spring wheat, the 2023 average was 10 bushels greater than the previous 10-year average and for spring barley the average yield of the extension variety trials were slightly lower than the 10-year average. Barley yields in the trials were lower than expected due to harvest delays and late season rain. Plant heights were 2 inches less than average for winter wheat and 3 inches greater for spring wheat and 1 inch higher for spring barley. Lodging was very low for both winter and spring wheat and a little below average for spring barley. In commercial production fields, grain maintained excellent yield and quality due to good grain fill conditions but only when harvested prior to the late season precipitation.

Crop quality was considered good to excellent with very little damage from Fusarium head blight (FHB) and very low to no vomitoxin levels detected overall. Standard practices of fungicide application in fields of grain planted after corn help reduce FHB and levels of DON (vomitoxin associated with FHB infection), and overall disease levels were minimized.

### **Disease and Insect Problems**

Damage from insect and disease was limited. Some wireworm damage occurred in the very early part of the season and cereal leaf beetles were consistently responsible for low levels of leaf damage during the season. There were very low levels of stripe rust reported late in the growing season in southern and eastern Idaho, and bacterial leaf streak (*Xanthomonas* spp.) was widespread in

barley in eastern Idaho. Physiological leaf spot (PLS) was not a problem in 2023.

There was significant snow accumulation and surprisingly very little winter wheat was damaged by snow mold. Overall, foliar diseases were low as compared to previous years, except for black chaff and bacterial leaf streak that were widespread. Infection with *Xanthomonas* often occurs earlier in the season facilitated by hail or sleet events, which then develops rapidly as the temperature increases during the summer and spreads via irrigation. There is very little that can be done to prevent or reduce the disease as fungicides are completely ineffective on bacterial diseases. Reducing frequency of irrigation and increasing duration and amount per irrigation is supposed to reduce how fast the disease spreads with splashing water. Clean seed is also supposed to reduce likelihood of transmission to additional fields; however, the bacteria occur throughout the production region, and hail and sleet events are unpredictable and uncontrollable. Effective measures to reduce the disease are often not economically practical or possible when environmental conditions are conducive for infection and spread.

**Wireworms** (of various species) were damaging in only a few areas across the region, reducing stand and yield of spring wheat and barley in dryland production, but damage was not severe as in previous years. As soils become dry and warm as the season progressed, damage drops as the wireworms bury deeper into the soil. In general, winter grain can be used to avoid wireworm damage as wireworms are less active in warmer, drier soils when winter wheat would be planted. However, seedling emergence in dry soils is problematic, and winter kill increases under cold and dry conditions. Most insecticides applied as seed

treatments reduce but do not control wireworms and the resultant feeding damage. Newer insecticides offer better protection.

**Wheat Stem Sawfly** (*Cephus cinctus* Norton) was not damaging in dryland spring grain as in previous years. The discovery of **Hessian fly** (*Mayetiola destructor* Say) in southern Idaho in 2015 raised a great deal of concern, as many of our currently grown varieties are not Hessian Fly resistant. The Hessian fly larvae were discovered in late-planted spring wheat in the Parma area. There was a second report of Hessian fly in 2021 occurring in volunteer wheat near Parma. Thankfully, Hessian fly has not become a problem in southern Idaho. Hessian fly may also damage spring barley.

Volunteer grain continues to contribute to green bridge conditions (see additional definitions and explanation of green bridge conditions in following pages). Usually, early planted winter wheat and barley may suffer from barley yellow dwarf virus (BYDV) and wheat streak mosaic virus (WSMV) infections, but many producers have the equipment necessary to avoid having to plant too early to get all their acreage planted. When there is long, hot and dry break between harvest of spring cereals and planting of the winter crop, the risk of disease transmission via the green bridge is significantly reduced. When winter and spring crop maturity is delayed, as in 2023, the risk of disease carryover increases significantly. The 2023-2024 cropping season may see increased incidence of disease as a result.

**Stripe rust** (*Puccinia striiformis* f.sp. *tritici*) Stripe rust did not infect susceptible varieties of fall-planted wheat, and there was no disease carryover to the spring. Some susceptible spring wheat became infected

very late in the season, but incidence was extremely low. Actively scouting fields of susceptible varieties is highly recommended to identify infection as early as possible. Fungicides can then be applied to prevent yield loss especially should stripe rust infect wheat plants prior to flowering. Susceptible varieties, such as the soft white winter wheat Brundage, may need two fungicide applications to control stripe rust in high pressure years. Two-rowed barleys tend to have greater levels of resistance to stripe rust than do the six-rowed varieties, and only a few incidences of barley stripe rust was found in 2023.

**Barley scald** (*Rhynchosporium secalis*) did not reach damaging levels and foliar disease throughout the region was very limited on barley. In most years, low levels of early season scald infection do little to affect the barley crop and can be ignored. Several previous years (2009-2011) were not by any means typical, and scald ran rampant in fields in 2009 where application of fungicides would have prevented significant crop loss. This will be a disease to watch in the future, especially as production of winter barley increases the chances of high levels of disease developing which then may affect early development in spring barley. Barley scald also increases in minimum and no-till situations where the fungi may reside in residue.

**Snow mold** (*Typhula spp.*) occurs during long periods of snow cover when snow falls on unfrozen soil. Stand of winter wheat in upper elevation areas was under snow for as long as 6 months without significant damage. In the snow mold prone area of Tetonia and Ashton, snow mold did reach damaging levels. Snow mold was not a significant problem in 2020 through 2022. In 2019, wheat stands were reduced 75-100% in production fields around Ashton.

Those fields were replanted with spring grain.

**Strawbreaker foot rot** (formerly *Pseudocercospora herpotrichoides* now *Ocumacula yallundae* and *O. aciformis*) is a stem-based disease usually found in winter wheat and barley, but in some years can be found in spring grains. Strawbreaker, also called eyespot, occurred throughout the production region in 2019 and 2020, and in 2020 and 2022 was as prevalent in spring grain as in winter grain. Infection occurs from residue-borne fungi when there is excess moisture, humidity and cool temperatures through the winter and spring. Characteristic elliptical lesions form at the lower nodes of the stem, weakening the tiller and increasing lodging. This disease is exacerbated by heavy seeding rates, rainy spring conditions and successive years of grain production. High rates of nitrogen fertilizers also promote the disease, especially when applied alone without other 'balancing' nutrients like potassium and phosphorus. The most effective means of reducing this disease is through crop rotation. However, if detected early in the spring, this disease is reduced with the application of benomyl fungicides like Benlate, Topsin M, or Mertect.

**Fusarium spp.** causing foot rot, some *Rhizoctonia spp.* and **Take-all** (*Gaeumannomyces graminis* var. *tritici*) occur frequently in grain following grain. Fusarium infection increases when deficit moisture conditions occur early to mid-season under dryland conditions and occurs where irrigation was not increased to compensate for moisture deficits. There were only a few incidences of take-all in over-irrigated and thickly seeded fields. However, there were several spring wheat fields with Pythium and Rhizoctonia infections that occurred when volunteer

plants were killed with herbicide immediately prior to planting. It is highly recommended to eliminate volunteer grain in the fall prior to winter setting in, or at least two to *three* weeks prior to spring sowing. Later planting reduces spring yield and quality, but substantial and greater yield reductions occur from soil-borne diseases in grain following grain. Diseases that increase then spread from dying grain causes a great deal of damage to the developing roots and seedlings of the newly planted crop, reducing tillering, and water and nutrient uptake.

**Rhizoctonia** infections occurred in production fields where winter wheat followed winter wheat. Symptoms were more severe with heavier wheat straw residue leading to reduced stands in affected areas, with the cool wet spring exacerbating the severity. Symptoms include stunting and yellowing of plants, fewer tillers and leaves with yellow stripes that resembled nutrient deficiencies. Best management practices include crop rotation and even distribution of straw at harvest with combine choppers / spreaders.

**Pythium** this year was not damaging to winter wheat and early planted spring wheat and barley. Pythium can be very damaging to early planted spring grain when rains and cool temperatures followed planting, which was an issue in 2019 but less so in 2020 and 2021. While conditions were optimal for Pythium in 2023 and 2022, seed treatments (with metalaxyl, mefenoxam and / or ethaboxam) can prevent or reduce infection of vulnerable seedlings. There are strains of Pythium with resistance to metalaxyl / mefenoxam, that do not (yet) show resistance to ethaboxam fungicide.

Luckily, growing conditions in 2023 were not conducive to widespread grain infections

of **Fusarium head blight (FHB)** (also called Head Scab, causal organisms *Fusarium graminearum* and other *Fusarium* spp.). Hot and dry conditions at flowering were not favorable for infection. Low levels of DON (<1 ppm) occurred in seed grain that was planted in a field following corn. A significant problem in 2015, FHB reduced yields and contaminated grain with toxins over multiple years – as in 2011, 2012, 2014 and 2015. In 2015, *Fusarium graminearum* was widespread but was not restricted to where wheat followed corn production. Spores formed on corn residue can travel many miles in the wind. This disease also can be severe where spring barley followed corn, as the fungus reproduces extensively on corn residue. Rejectable levels of deoxynivalenol toxin, (abbreviated as DON and also called VOM, short for vomitoxin), which is a by-product of the fungal infection process, contaminated 2015 malt barley and many acres of spring barley in the Rupert production region. It is highly recommended that irrigated spring grain be treated with an appropriate fungicide at flowering to reduce infection, especially when a hard white or hard red spring wheat or barley follows corn production. Even in 2019 where conditions did not favor FHB, low levels of DON (less than 2 PPM) were found in barley following corn. In 2020, 2022 and 2023, there were very few reported cases of FHB or DON being problematic in spring wheat or spring barley. For prevention, it is essential that a **triazole** fungicide be utilized, as strobilurin fungicides are ineffective in reducing the accumulation of toxins.

The “**Spot Form of Net Blotch**” (SFNB) of barley *Pyrenophora teres* f.sp. *maculata* was first diagnosed in a few fields near Blackfoot in 2013. In 2014, SFNB became severe in many areas throughout Idaho and Montana. This disease occurs widely in North Dakota and the upper Mid-West,

reducing yields by up to 50% and grain weight by 20%. SFNB was still problematic in 2019, especially in no-till situations, but was not as severe as in 2015. Areas that have reduced tillage and low crop diversity are at increased risk as this disease survives in barley stubble. Some varieties are more susceptible than others. Crop rotation and fungicide applications significantly reduce the impact of this disease. Fields that had been sprayed with fungicides at herbicide timing have been observed to have significantly less disease. Additional testing to develop control recommendations in our environment is required, but in recent years, including 2023, the disease did not occur at significant levels.

**Barley Yellow Dwarf (BYD)** results when aphids carrying the barley yellow dwarf virus (BYDV) or cereal yellow dwarf virus (CYD) feed on newly emerged seedlings of wheat and barley, transmitting the virus as they feed. Earlier virus infections result in greater plant damage, resulting in yellowing of plant leaves and dwarfing of the infected plants. Characteristic leaf yellowing and sometimes “red flagging” of leaf tips occur early in the spring of winter cereals, but as the season advances, plants may grow out of the symptoms and regain green color. Yields are reduced in proportion to the time of infection and the incidence of infected plants. The source of the aphids may be from green bridge crops, volunteer cereals or nearby corn production. Corn will host both high aphid populations and many cereal viruses. As corn matures in the late fall, aphids may migrate to newly emerging winter cereals, transferring virus particles as they feed. Preventative measures include delaying planting of winter crops and the use of insecticidal seed treatments. It is important to note that early fall planting in combination with insecticidal seed treatments will not prevent BYD as the insecticide becomes ineffective within a

couple of weeks after plant emergence. Delaying planting dates is the most effective way to prevent BYD in combination with cold temperatures that reduce aphid populations.

**Wheat Streak Mosaic Virus (WSMV)** is transmitted by wheat curl mites in a similar fashion to BYDV. The vector, or source of the virus, often is associated with volunteer cereals in dryland production areas but may also be found in irrigated small grain and corn production. The most effective method of control for wheat streak mosaic virus infection is to control volunteer cereals that may be hosting both the virus and the mites, especially in dryland production areas.

**Soilborne wheat mosaic virus (SBWMV)** has recently been documented in northern Idaho but has not been detected in southern Idaho. The virus is associated with the fungal-like organism, *Polymyxa graminis* and infects winter and spring wheat. Winter wheat develops characteristic chlorotic streaks (yellowing) on leaves and leaf sheaths in the spring that dissipates as the season warms. Symptoms can be severe and develop first in low-lying areas with wet soil conditions that favor *P. graminis*. Once a field is infested, the only control is to use resistant varieties of wheat. Sourcing seed of crops like potatoes from areas known to be free of the pathogen is important in preventing the introduction of the virus to this area.

**Cereal cyst nematode (*Heterodera avenae*) (CCN)** damage occurs extensively in spring wheat and spring barley fields in the northern Snake River Plain, with visible damage in crops from Rexburg, Plano, St. Anthony and throughout the Ashton area. The long cool spring in 2023 reduced damage as there was low moisture stress and excellent growing conditions. CCN affects

all grassy crop species and can even infect grassy weeds. Research conducted in St. Anthony with Dr. Richard Smiley (Professor Emeritus, Oregon State University) identified resistant and tolerant varieties of spring wheat and barley and was published in 2015. Additional screening in the past two years has confirmed and identified additional varieties with resistance to CCN. Crop rotation to broadleaf crops substantially reduces CCN populations in the soil and subsequent damage to spring grain.

### **Green Bridge**

A “green bridge” is generally defined as the overlap of different cropping cycles (or crop generations) within a year. This means there is the constant availability of living, green host material of a given crop. This occurs in many locations in southern and southeast Idaho for several reasons: 1) late maturing tillers (such as occurred in 2010 and in 2023) of winter wheat stay green and grow even after harvest; 2) windy conditions causes shattering of spring grains (as in 2010) prior to complete maturity of the crop; 3) hail storms induce shattering of grains prior to crop maturity. Shattered grain germinates and results in the continuous presence of living host material, which means there is a constant supply of host plant material for disease-causing organisms and insects to thrive; 4) In most years, volunteer grain blown out of the combine at harvest germinates or is irrigated to provide forage, providing a green bridge, increasing the likelihood and risk of higher disease and insect problems for the next growing season. Many growers use the volunteer growth as feed or forage for livestock, but that can result in extensive carryover of insects and pathogens from year-to-year. In years like 2019, 2020 and 2021 where conditions are very dry in July, August and September, green bridge situations are less of a problem

as there is little moisture for germination of volunteer cereals, unless irrigation is applied to stimulate germination of residual seed.

Other green bridge examples include heavy, unusual rains in August of 2014 prior to harvest, which resulted in extensive losses due to sprout but also set up green bridge conditions when grain shattered and germinated before harvesting could occur. Because of the green bridge, aphids and certain disease-causing organisms can jump to the emerging winter crop, causing direct damage and / or transmission of viruses. In 2015, many growers irrigated the volunteer for forage. With an early harvest and a long warm fall of 2015, the volunteer from the spring crop was in grain fill prior to a killing frost in November. The green bridge situation resulted in extensive BYD and stripe rust infection in the fall volunteer.

In the fall of 2014, 2015 and 2016, high populations of aphids moved into the earliest emerging winter wheat and barley, contributing to a widespread occurrence of BYD in southern Idaho. Corn is a ‘silent’ host of barley yellow dwarf virus, hosting high concentrations of the virus without symptoms or damage to corn. Late in the fall season, aphids (especially English grain aphids and Bird-cherry oat aphids) move from corn to winter cereals, landing on the newly emerged grain and transmitting the virus to the new crop. Aphid populations may build up before a killing frost occurs. Severe stunting and yellowing of grain become apparent in the spring, resulting in yield reductions of over 50% in the most severely affected fields. However, in the springs of 2017 through 2021, lower levels of fall transmission occurred due to dry summers, delayed fall planting, use of insecticidal seed treatments and excellent growing conditions, preventing widespread losses from BYD.

## 2023 Report: Discussion of Location Conditions and Results

Following two years of below-average precipitation, subsoil moisture was very low in 2022. This became apparent later in the 2022 growing season when patchy areas in production fields quickly dried during grain fill. Fall rain in 2022, winter snow and spring rain helped replenish subsoil moisture and 2023 growing conditions were much improved over 2022. Cool spring temperatures reduced evapotranspiration, and improved tillering and grain fill of cereal crops.

NASS within the USDA reported out of 1.16 million acres of wheat planted in Idaho during 2023, 1.025 million acres were harvested. Winter wheat yields averaged 89 bu/A over all categories (irrigated and dryland winter), down slightly from 2022. For spring wheat, 395,000 acres were harvested of the 410,000 acres planted resulting in an average of 82 bu/A. Very dry conditions in Northern Idaho reduced average yields. Overall, quality was reported as good to excellent.

For barley, 540,000 of 570,000 acres planted in 2023 were harvested (NASS) for a total harvest of 60.5 million bushels, up 1% from 2022. The average yield in the state was reported as 112 bu/A.

[https://www.nass.usda.gov/Statistics by State/Idaho/index.php](https://www.nass.usda.gov/Statistics_by_State/Idaho/index.php)

For variety selection, it is best to consider three year or multiple year, multiple site averages from trials closest to your specific location. Conditions vary tremendously from year to year, and one-year results can often be misleading. Yield stability and disease reactions often require many years and/or locations of evaluations. Balance

selections based on yield, good test weight, protein levels appropriate to market class (low protein for soft wheats, high proteins for hard wheats) as well as disease resistance specific to your production zone. While the average multiple location/three-year data presented in the tables provide more accurate information, new varieties will have limited performance information, which may not be a good reflection of long-term performance. Choose varieties that genetically produce optimum protein for the market class. As an example, it is more effective to choose hard red spring wheats that consistently produce high protein and high test weight than to manage a lower protein hard red with targeted nitrogen applications.

### Protein Targets

Hard Red Winter Wheat = 12.5% minimum

Hard Red Spring = 14.5% minimum

Soft White Winter = 10.5% (9-12%)

Soft White Spring = 10.5% (9-12%)

Club wheat <10%

Malt Barley = 9.5-12.5%

**Keldin + 11-52-0** – In-furrow fertilizer was added to one variety in the hard winter group to test the effect of starter fertilizer on yield. (Monoammonium phosphate or 11-52-0 at 20 lbs phosphate per acre was included in-furrow at multiple locations in the hard winter wheat trials.) In Table 4, Keldin under irrigation was 5 bu/A greater than Keldin +11-52-0 starter fertilizer which is not considered statistically significant (LSD = 6 bu/A at Pr < .01). Table 4 includes three years of data over multiple irrigated sites. Other agronomic traits were also very similar indicating no effect of starter fertilizer. Under dryland conditions (Table 5), Keldin + 11-52-0 was 3 bu/A greater than Keldin, with the LSD of 3 bu/A. The impact of starter fertilizer is often greater and statistically significant under dryland

conditions where there is usually not a lot of excess nutrients left from the previous crop.

### **Winter Wheat 3-Year Averaged Data**

**Three-year averages of hard winter wheat** over all irrigated locations (Table 4, 11 site-years) put Keldin, WB4510CLP, LCS Rocket, MT1745, Milestone, Keldin + 11-20-0, and Flathead as the top yielding varieties with 157, 153, 153, 152, 152, 152 and 151 bu/A, respectively. Test weights were low, averaging 58.4 lbs/bu. The protein target for hard red winter wheat is 12.5%, and these trials resulted in lower than optimum protein of 12.3%. Lower yielding varieties had enough residual soil and applied nitrogen to meet protein goals, but higher yielding varieties required additional protein to hit desired targets. **Averaged over all 2023 irrigated locations**, the highest yielding **hard winter wheat** varieties (Table 6) were MT1745 (159 bu/A), Yellowstone (158 bu/A), WB4510CLP (156 bu/A), WB4401 (156 bu/A), Flathead (155 bu/A), LCS Rocket (155 bu/A) and Milestone (153 bu/A), with WB4401 having higher-than-average test weight, but lower protein (11.6%). Test weight in 2023 was very low due to pre-harvest sprout from late-season rain. While 2023 heading dates of the irrigated locations were similar to 2022, dryland locations in 2023 headed up to ten days behind 2022. Yellowstone, as the highest yielding named hard red winter variety, headed 1 day later than the average for the irrigated trials, was five inches taller and had 11.8% protein. UI Bronze Jade was the highest yielding hard white winter variety (14 bu/A less than Yellowstone), but poor end-use quality will limit marketability of UI Bronze Jade.

**Average 3-year dryland yields for hard red and white winter** (Table 5) were 32 bu/A, 3 bu/A less than 2022. The top

yielding varieties included UI SRG (33 bu/A), UI Silver (31 bu/A), Promontory (31 bu/A), Sequoia (30 bu/A), and WB4510CLP (30 bu/A). Protein average for these trials was 12.5%, and test weight averages were very low, with 56.3 lbs/bu average. **2023 combined dryland yields for hard red and white winter wheat** (Table 7) averaged 35 bu/A, much less than 2022 which was 44 bu/A. The highest yielding varieties in 2023 were Yellowstone (44 bu/A), FourOsix (42 bu/a), NuMont (41 bu/A), MT Warcat (38 bus/A), and Sequoia (38 bu/A). Proteins were high, averaging 13.9% grain protein.

The top yielding **soft white winter varieties over the last three years** over all irrigated locations (Table 14) are AP Exceed (155 bu/A), LCS Hulk (152 bu/A), Sockeye CL+ (152 bu/A), WB1783 (152 bu/A), and SY Ovation (149 bu/A). All test weights were below 60 lbs/bu, averaging 56.5 lbs/bu due to late season rains inducing pre-harvest sprout. Proteins for the trials were within the soft white winter protein targets of 9–12% grain protein. **Averaged over all 2023 irrigated locations**, the highest yielding **soft white winter wheat** named varieties (Table 16) were AP Exceed (156 bu/A), Sockeye CL+ (153 bu/A), LCS Hulk (152 bu/A), SY Ovation (152 bu/A), and WB1621 (146 bu/A). Low test weights were directly related to late rains. The Rupert winter trials were replanted to potatoes. Heading date averaged June 11, one day earlier than in 2022, and average test weights were very low at 57 lbs/bu due to preharvest sprouting.

**Average 3-year dryland yields for soft white winter** (Ririe, Rockland and Soda Springs in Table 15) were 32 bu/A, where the top yielding varieties included Sockeye CL+ (46 bu/A) and Piranha CL+ (44 bu/A). Eltan with 11-52-0 yielded 4 bu/A greater than Eltan without the preplant fertilizer. All

had test weight less than 60 lbs/bu and WB1376CLP+ had protein over 13%. **One-year combined over dryland locations of Ririe and Soda Springs for 2023** (Table 17) averaged 32 bu/A, 13 bu less than in 2022, with the highest yielding varieties at 40 bu/A (Sockeye CL+), 39 bu/A Tandem and Piranha CL+) and 37 bu/A (Otto) and 36 bu/A (Hulk). Eltan with 11-52-0 in furrow yielded the same as without starter fertilizer. Heading date (6/28) was eight days later than 2022. Due to late-season rain, test weights averaged 55.2 lbs/bu. Grain protein averaged 12.9%, high for a soft white market class.

### **Winter Barley 3-Year Averaged Data**

Three-year, multiple location averages for winter barley are presented in Table 24. Due to winter damage, spring stand at the Rupert location was poor and plots were destroyed and replanted to potatoes. Winter damage was also significant at Aberdeen, where the first two reps were not used for data analysis. Top yielding released varieties include Thunder (153 bu/A), KWS Donau (150 bu/A), Flavia (150 bu/A), LCS Calypso (148 bu/A) and Wintmalt (143 bu/A). There is malt, feed (Sunstar Pride, Eight-Twelve) and food lines in this trial, with Upspring and 13ARS537-19 being hullless food lines with very high test weight (comparable to winter wheat) but having reduced spring stands. Proteins were mostly in the target range for malt specs except for the food line Upspring (which averaged 13.0% grain protein), Flavia, Charles, Endeavor and LCS Calypso. High protein and low test weights of 2021, 2022 and 2023 reduced overall 3-year averages. Plumps of Charles and Endeavor were low and lodging was high compared to the other winter malt varieties. The six-rowed feed lines Sunstar Pride and Eight-twelve had very low test weight. KWS Donau, Flavia, and Upspring had lower

lodging than average. For the one-year **irrigated averages in 2023** (Table 25), the data presented is the limited data from Aberdeen. Top yielding varieties are Clementine (114 bu/A), BC Fay, (105 bu/A), and KWS Donau (89 bu/A). Irrigated trial averages was 68 bu/A with poor test weight average of 47.2 lbs/bu and high grain proteins at 15.0%. Heading dates averaged four days later than 2021 and 1 day later than 2022.

### **Spring Wheat 3-Year Averaged Data**

Over **three years over all locations**, averaged over twelve site-years, the highest yielding hard spring varieties under irrigation (Table 26) were UI Gold (hard white at 122 bu/A), Dayn (hard white spring wheat at 122 bu/A) and WB9707 (hard red spring at 119 bu/A). The hard reds with the best combinations of test weight and high protein include WB9707, Holmes, Dagmar, Alum and WB9668. The average 3-year test weight was 59.6 lbs/bu, and the average grain protein was 13.7%. High protein lines were Dagmar (14.7%), WB9668 (14.6%), Espresso (14.3%) and Alum and WB9707 (14.1%). The **2023 combined irrigated average** (four locations) for hard spring wheat (Table 28) was 119 bu/A, 7 bu greater than 2022 (112 bu/A) and 15 bu/A greater than 2021 (94 bu/A). WB9707 and Dayn (W) were the highest yielding lines at 135 bu/A and 134 bu/A, respectively. High protein red lines were WB9668 (14.3%), Dagmar (14.2%) and WB9707 (14.0%).

There is only one **dryland location** for spring wheat (Soda Springs), and the three-year average data is in Table 27. Highest yielding hard spring varieties include Dayn (W) at 36 bu/A, Alum (35 bu/A), Net CL+ (34 bu/A), and SY Teton at 33 bu/A. Test weights averaged 60 lbs/bu, but grain

protein was less than 12.9% indicating higher fertilization is required to bring the hard spring wheat up to preferred levels of grain protein. Net CL+, Rocker and Choteau showed high test weight and high grain protein.

**Three-year averages for soft white spring wheat over all irrigated locations** (Table 35) put WB6430 at the highest yield (125 bu/A) of the named varieties, followed by UI Stone (122 bu/A) and Alturas (121 bu/A). The **2023 combined irrigated average** for soft white spring wheat (Table 37) was 121 bu/A, 3 bu/A greater than in 2022. WB6430 yielded 134 bu/A, Alturas yielded 129 bu/A, UI Stone was at 128 bu/A, and Melba (a club wheat) at 126 bu/A. Test weight was low at 54.4 lbs/bu for the average due to preharvest sprout, and grain protein 10.6%, which was good for soft white spring wheat.

There is only one **dryland location** for soft white spring wheat (Soda Springs), three-year average data for which is in Table 36. Louise, UI Stone, Melba and AP Coachman were the highest yielding varieties at 40 bu/A, followed by Ryan and Hedge CL+ at 38 bu/A. Test weight average was 59.6 lbs/bu, and protein was 10.1%.

### **Spring Barley 3-Year Averaged Data**

Spring malt varieties and feed/food lines are reported in separate tables.

**Three-year irrigated averages (12 site-years) for the malt varieties** (Table 44) were 134 bu/A with Esma, BC Leandra and LCS Odyssey at the top (152, 147, 144 bu/A, respectively), all with good test weight, plumps and protein. The top four yielding varieties are European lines. ABI Eagle and GemCraft were the top yielding US lines both at 137 bu/A.

**For the only dryland location for spring malt (Soda Springs)**, the three-year average data is in Table 45. GemCraft and Esma were the higher yielding varieties at 46 and 45 bu/A, respectively with low proteins. CDC Copeland, at 40 bu/A, had excellent plumps for dryland conditions, but also had higher grain protein.

Looking at **combined irrigated averages for 2023** (Table 46), Esma, BC Leandra, and BC Lexy yielded 162, 158, and 157 bu/A respectively, all with good test weight, protein and plumps. The heading date for the 2023 trials was the latest compared to the previous ten-year average, 9 days later (see Table 3).

**For the feed and food varieties, over three years (12 site-years)**, Altorado, Claymore, and Oreana were the highest yielding named feed varieties (Table 53) at 147 bu/A, 147 bu/A and 144 bu/A, respectively. Kardia (hulled) was the highest yielding food barley, followed by Julie, Transit, and Goldenhart (all are hullless, as reflected in the very high test weights). In the **combined 2023 irrigated trials** (Table 55), the top yielding named varieties were Altorado (155 bu/A), Claymore (150 bu/A), and Oreana (143 bu/A). Kardia was the highest yielding food barley (140 bu/A) but is hulled with lower test weight in comparison to the other hullless food barleys. The heading date for the 2023 trials was the latest compared to the previous ten-year average, 9 days later than average (see Table 3).

**For the only dryland location for spring feed and food barley (Soda Springs)**, the three-year average data is in Table 54. Idagold II, Champion and Altorado were the higher yielding varieties at 45, 45 and 44 bu/A, respectively. Grain protein averaged 11.3%. The hullless food lines tend to perform poorly under dryland conditions,

yielding about 27 bu/A. The hulled food line, Kardia, yielded 39 bu/A.

### **Kimberly Research and Extension Center, Irrigated Winter Grain**

Winter wheat nurseries were planted following dry beans on October 11, 2022 – and were planted into good conditions. Preplant irrigation helped provide conditions for uniform germination. The crop suffered a little winter damage and was planted late enough to avoid BYDV infection. Stripe rust was absent. Plots were harvested August 15<sup>th</sup>, six days later than in 2022.

The hard winter wheat group (Table 8) yield ranged from 133 to 177 bu/A. The highest yielding varieties were Flathead at 177 bu/A, MT1745 at 173 bu/A, WB4510CLP at 173 bu/A, and Keldin at 170 bu/A. Yellowstone, Milestone, WB4303 and WB4401 were the next highest yielding varieties, yielding 169, 168, 167, and 167 bu/A, respectively. Site average for yield of the hard winter group was 158 bu/A, 11 bu/A less than 2022 and 34 bu/A greater than 2021 yields (Table 8). Test weight average was 60.3 lbs/bu, and grain protein average for the location was low at 10.7%. The plots were highly fertilized for expected yield indicating potential N loss. The resulting low grain protein is unexpected. Heading dates averaged 2 days later than in 2021. Total N available was 558 lbs N/acre. Optimal grain protein for hard red winter wheat should be 12.5% or greater. The ratio of total N to (158 average) bu/A yield was 3.5, within the 3.0 to 3.5 ratio needed for optimal protein in hard winter wheat.

Soft white winter wheat yields averaged 136 bu/A – 31 bu/A less than 2022, and 3 bu/A less than in 2021 (Table 18). Irrigated yield varied from 83 to 167 bu/A with higher CV's for the location than in 2022 and 2021, probably due to variability of stand

increasing with winter damage. SY Ovation (167 bu/A), Sockeye CL+ (161 bu/A), LCS Hulk (161 bu/A), AP Exceed (156 bu/A), Piranha CL+ (151 bu/A), and AP Iliad (150 bu/A) were the highest yielding varieties. Heading dates averaged 1 day later than in 2022. Test weight averaged a low 59.4 lbs/bu and grain protein average for the location was low at 8.9%. With a total of 404 lbs available N in the nursery (see site description on page 6) and average yield for soft white winter wheat nursery at 136 bu/A, the lbs of N to yield calculates to 3.0 lbs of nitrogen per bushel of yield.

### **Rupert, Luke Adams, Irrigated Winter Grain**

Plots were planted September 28, 2022 in silt loam soil following barley into good soil moisture and seedbed conditions. Spring stands of the winter wheat nurseries had cold damage, but the winter barley had extensive winter kill. The field was in winter barley which suffered extensive winter kill. The entire field was plowed under and replanted to potatoes.

### **Aberdeen Research and Extension Center, Irrigated Winter Grain**

The winter trials in Aberdeen were planted October 4<sup>th</sup> in a Declo loam soil into good seedbed conditions and soil moisture, and harvested August 24<sup>th</sup> and 25<sup>th</sup>. The preceding crop was green manure oats. Neither BYD nor stripe rust was observed in the winter grain.

Winter barley yields were low due to winter kill conditions that damaged the first two reps. Average yields were only 68 bu/A with a range from 2 bu/A to 116 bu/A (Table 25). High yielding lines and varieties included Clementine (114 bu/A), BC Fay (105 bu/A), and KWS Donau (89 bu/A). Spring stands were very poor, with the hullless Upspring pretty much wiped out. If winter kill is a

problem, the hulless or naked food lines and Charles and Endeavor (older malt barley lines) are often the most susceptible and are the first to show damage. Test weight averaged 47.2 lbs/bu and 15 % grain protein. With poor stand and excess nitrogen available in the soil, the high protein would be expected. Due to the conditions, the CV for this trial very poor (56%).

The hard winter wheat survival (Table 9) averaged 93%, with a few lines showing significant damage. Overall yields were similar to 2022 and greater than 2021 by 18 bu/A. Lodging was very low and stripe rust was not present in the winter wheat and did not impact yield. The highest yielding lines were WB4401 (167 bu/A), FourOsix (164 bu/A), Flathead (162 bu/A), Scorpio (162 bu/A), WB4510CLP (161 bu/A), Yellowstone (161 bu/A) and Keldin (160 bu/A). The CV of 6.9% for yield was good. Heading date for this group at Aberdeen was six days later than last 2021 and 1 day later than 2022. Test weights were low at 57.0 lbs/bu for the overall average after having late season rain impact sprout. There was no lodging in the trial, and grain protein averaged 12.7%. The ratio of applied N to average bushel yield was high at 3.4 lbs N/bu (526 lbs N/156 bu/A).

The overall yield average in the Aberdeen soft white winter trial (Table 19) was 144 bu/A, 19 bu/A less than in 2022, and 5 bu/A greater than 2021, ranging from the low of 88 bu/A (VI Voodoo CL+) to a high of 164 bu/A (LCS Hulk). The highest yielding named varieties were LCS Hulk (164 bu/A), AP Exceed (160 bu/A), WB1621 (160 bu/A), and SY Ovation (159 bu/A). Heading date for this group at Aberdeen was three days earlier than 2022 and three days later than last 2021. The test weights averaged very low at 54.4 lbs/bu due to sprout damage and the overall grain protein was

11.9%. The ratio of applied N (411 lbs N) to average bushel yield (144 bu/A) was 2.9 lbs N/bu. There was no low lodging to report.

### **Ririe, Clark Hamilton, Irrigated Winter Wheat**

Located near the town of Ririe, this irrigated location was added in 2019 on Hamilton Farm about 600 feet lower in elevation than the dryland plots on the church farm. The plots were planted September 26<sup>th</sup>, into silt loam soil following wheat, and harvested August 17, a week later than 2022. Late season rains impacted test weights and quality

Spring stand of the hard winter wheat trial at this high elevation location was impacted by winter kill and lengthy snow cover (Table 10), and the average yield was 133 bu/A, 23 bu/A less than in 2022. Yields varied from 109 (Balance) to 159 bu/A (Flathead). The high yielding lines included Flathead, Keldin (151 bu/a), and WB4510CLP (147 bu/A). Test weight averaged 59.8 lbs/bu even with rain prior to harvest. Grain proteins were 12.2%, with 2.5 lbs N per bushel (301 total N available /133 bu average yield), indicating less than optimum levels of N to meet yield and protein of the higher yielding varieties. Heading date was one day later than the previous year.

For the soft white winter wheat trial (Table 20), the yield varied from 98 bu/A to 139 bu/A (UI Sparrow and AP Exceed) with an overall average of 117, 39 bu/A less than 2022 and 15 bu/A less than in 2021. Test weights averaged 57.3 lbs/bu due to sprout damage. Grain protein averaged 11.5%. The ratio of lbs N to bushel yield was 2.2 (261 total N available /117 bu average yield), indicating optimum levels of N to meet yield and protein. The high-yielding lines and varieties included AP Exceed (139 bu/A), WB1621 (134 bu/A) LCS Hulk (132 bu/A),

and WB1783 (130 bu/A). Heading date was two days later than the previous year.

### **Ririe, LDS Church Farm, Trevor Davey, Dryland Winter Wheat**

This is a high elevation location (5600 ft.) and is our main location to test grain for winter hardiness under dryland conditions. Soil moisture and stand establishment was very good. Grain was planted late for this location September 26<sup>th</sup> following fallow. Seed germinated and emerged prior to the onset of winter and spring stands averaged 96- 98%. There was no significant disease or physiological leaf spot symptoms in 2023.

The hard winter wheat yield average was 38 bu/A (Table 11). The 2023 yield ranged from 31 to 46 bu/A with a yield CV at 11.3%. The top yielding varieties this year were WB4422 (46 bu/A), Keldin + 11-52-0 (46 bu/A), FourOsix (45 bu/A), Yellowstone (44 bu/A) and MT1745 (44 bu/A). The addition of 20 lbs of P<sub>2</sub>O<sub>5</sub> of preplant fertilizer as 11-52-0 in furrow resulted in an increase of 4 bu/A over the untreated Keldin. Heading date was eight days later than 2021 (6/8). Grain proteins were good at 13.7%.

The soft white winter nursery yields varied from 29 bu/A (Appleby CL+) to 42 bu/A. The soft white winter varieties Otto, Sockeye CL+, LCS Hulk, Devote, Eltan with 11-52-0, Nimbus, TMC M-Pire, Piranha CL+ and AP Exceed averaged 40, 39, 39, 39, 38, 38, 38, 38 and 38 bu/A respectively (Table 21). The test weights averaged 55.3 lbs/bu, low due to sprout damage. Grain protein averaged 12.4%, high for soft white wheat targets. Heading date was six days earlier than 2021.

### **Rockland, Cory and Jaime Kress, Dryland Winter Wheat**

The hard red and white winter wheat trial at the Kress's was planted following garbonzo

beans (chick peas) on September 20<sup>th</sup> and harvested August 11. Snow mold diseases were a significant problem, and spring stands were very poor. As a result, the trial data will not be reported.

### **Soda Springs, Cody Cole, Dryland Winter Wheat**

The hard red and white winter wheat trial at the Cole's was planted following fallow on September 27<sup>th</sup> and harvested very late on September 26<sup>th</sup>. Spring stands were very poor for this high elevation location, running from 5% to 96%. With low stands, plots stayed green and did not mature until very late. Seed quality was very poor and CV's were high. As 2021 plots were not harvested, the three-year data reported includes 2020 results.

In the hard winter trial, twenty-nine varieties of hard red and hard white wheat were planted, including one check with in-furrow phosphorus fertilizer (Table 12). The Keldin 11-52-0 included an in-furrow application of monoammonium phosphate at 20 lbs P<sub>2</sub>O<sub>5</sub> phosphate per acre but yields (27 bu/A) were not statistically different than Keldin without the in-furrow fertilizer (28 bu/A). With an LSD of 8 bu/A, the yield of Keldin with 11-52-0 would have to be 8 bu/A greater be considered significant.

There was no stripe rust pressure at this location, and the spring stands for the hard winter group averaged 70%. The relatively cool spring and low spring plant stands resulted in average heading dates of 7/11 compared to 6/25 for HWW in 2022, 6/26 in 2020, and 7/2 for 2019. The highest yielding varieties included Yellowstone (43 bu/A), Golden Spike (39 bu/A), FourOsix (39 bu/A) and Sequoia (38 bu/A). Test weight was poor, averaging 57.2 lbs/bu due to pre-harvest sprout and late season rain. There was no lodging. The ratio of available N

(106 lbs N/A) to average bushel yield (31) was 3.4 N/bu. As a result, the proteins were very high with the trial average of 14.3%.

Thirty-five soft white winter wheat varieties were tested in 2022-23 (Table 22). Winter was severe with over 6 months of snow cover, resulting in an average 5-91% spring stand. Heading dates averaging 7/10 were significantly behind at this location in comparison to 2022 (6/25), 2020 (6/28), 2019 (7/3) and 2018 (6/21). Average yields for the soft nursery were 28 bu/A. The yield ranged from 7 bu/A (OrI2190027CL+) to 45 bu/A (WA 8415). The highest yielding named varieties included Norwest Tandem (43 bu/A), Piranha CL+ (41 bu/A), Sockeye CL+ (59 bu/A), UI Sparrow (36 bu/A), and Eltan (35 bu/A). There was no lodging, proteins were very high at 13.4% average, and test weights very low (55.1 lbs/bu) due to last season rains.

The Eltan 11-52-0 included an in-furrow application of monoammonium phosphate at 20 lbs P<sub>2</sub>O<sub>5</sub> phosphate per acre but yields (33 bu/A) were not statistically different than Eltan without the in-furrow fertilizer (35 bu/A). With a LSD of 11 bu/A, the yield of Eltan with 11-52-0 would have to be 52 bu/A to be considered significantly greater.

The ratio of available and applied N (106 lbs N/A) to average bushel yield (28) was 3.8 N/bu. As a result, the proteins were very high with the trial average of 13.4%. No lines were below highest protein optimum levels except WB1621 and WA8415.

If risking planting winter wheat in the Soda Springs area, it is highly recommended that varieties with snow mold tolerance and dwarf bunt resistance be grown. Varieties susceptible to dwarf bunt should only be grown following appropriate seed treatments for dwarf bunt control. In low precipitation

years, soft wheat varieties risk having too high grain protein.

## Spring Grain Locations

### Rupert, Taylor Grant, 4-D Farms, Irrigated Spring Grain

The variety trials in Rupert were planted April 24<sup>th</sup> in silt loam soils, 6 days later than in 2022 and 23 days later than in 2021. Trials were planted into good soil moisture and harvested August 24<sup>th</sup> and 25<sup>th</sup>. The preceding crop was sugar beets. There were no major weather-related problems.

There was no lodging for the **hard spring wheat** nursery (Table 29) with an average yield of 117 bu/A, compared to 104 bu/A in 2022, 109 bu/A in 2021, 114 bu/A in 2020 and 131 bu/A in 2019. Test weight average was 58.0 lbs/bu, and average protein was at 13.6%. The top yielding named varieties were UI Gold (133 bu/A and 12.7% protein), LCS Hammer AX (132 bu/A and 13.2% protein), WB9707 (132 bu/A and 13.8% protein), Dayn (129 bu/A and 13.0% protein) and Jefferson HF (126 bu/A and 12.8% protein). The ratio of available and applied N (376 lbs N/A) to average bushel yield (117) was 3.2 lbs N/bu. The average grain protein for this trial was 13.6%, below the target of 14.5% for hard red spring wheat, and above the minimum for hard white of 12.5% protein. All hard red and white spring plots were topdressed at flowering with 40 units of N/A. Heading date for this location was three days earlier than 2022.

The **soft white spring wheat** yield (Table 38) average was 112 bu/A. In 2022, the yields averaged 102 bu/A, in 2021 yield averaged 128 bu/A, 2020 was 117 bu/A, and in 2019 it was 140 bu/A. In 2023, WB6430 was the highest yield soft white spring, yielding 128 bu/A at 9.3% grain protein, UI

Stone yielded 125 bu/A at 9.5% protein, and UI Cookie yielded 117 bu/A at 9.8% protein. Grain protein average was at 9.9%. The ratio of available and applied N (296 lbs N/A) to average bushel yield (112) was 2.6 lbs N/bu. The yield CV was also good at 6.4%, indicating the variability in this trial was lower than in 2022 and 2021.

The **spring malt barley** trial at Rupert (Table 47) had average yields of 148 bu/A, 15 bu/A greater than 2022 and 2021. Yield ranged from 127 (Merit 57) to 171 bu/A (BC Lexy). The ratio of available and applied N (296 lbs N/A) to average bushel yield (148) was 2.0 lbs N/bu. Lodging averaged 1% overall, and grain protein averaged 10.7%, about within the expected range for malt barley. BC Lexy was the top yielding malt barley (171 bu/A), followed by LCS Diablo (166 bu/A), Esma (162 bu/A), LCS Odyssey (160 bu/A), BC Leandra (159 bu/A), and GemCraft (158 bu/A). Test weights averaged 49.3 lbs/bu, and percent plumps were 97.3%. Heading date for this trial was 6/22, one day later than 2022 and 12 days later than 2021, reflecting a long cold spring.

The average yield for two-rowed feed barley in Rupert for 2023 (Table 56) was 160 bu/A, 33 bu/A greater than 2022, and 20 bu/A greater than 2021. The high yielding two-rowed feed varieties were Claymore (167 bu/A), Altorado (142 bu/A) and Oreana (159 bu/A). Average test weight for this trial was 50.2 lbs/bu for the feed barleys, and 54.8 lbs/bu for hullless and hulled (Kardia) food barleys. The overall yield of the food barleys was 104 bu/A. Kardia yielded 160 bu/A. The hullless, high beta-glucan food barleys HO517-126, Julie, PlanetMax3.16, 16ARS295-1 and Transit, yielded 128, 108, 106, 106 and 106 bu/A but also had high test weights. For this trial, the ratio of available and applied N (296 lbs N/A) to average

bushel yield (160) was 1.9 lbs N/bu with a site average grain protein of 11.2% for the feed lines. For the food barleys, the ratio was 2.8 lbs N/bu with 12.9% protein.

### **Aberdeen Research and Extension Center, Irrigated Spring Grain**

Spring variety trials were planted April 21<sup>st</sup>, 15 days later than in 2022 and 19 days later than in 2021. Trials were planted into Declo loam soils with good soil moisture and were harvested August 29<sup>th</sup> and 31<sup>st</sup>. The preceding crop was green manure oats. Stripe rust of wheat was present at very low levels late in the season and overall disease pressure was very low.

The CV's for the Aberdeen spring trials were good, with the CV for the hard spring wheat nursery at 8.8% for yield (Table 30). Hard spring wheat yield varied from 111 bu/A (WB9668) to 153 bu/A (Dayn hard white spring) with an overall average of 127 bu/A. The top five named varieties for yield in the hard red and white trial were the hard white springs Dayn, UI Gold (131 bu/A and 13.8% protein), hard reds Jefferson HF (137 bu/A and 12.5% protein) and WB9707 (134 bu/A and 13.5% protein). Test weights for the hard spring wheats averaged 58.5 lbs/bu, low due to late rain at the location. There was some lodging of three varieties (Hale, Glee, Dagmar) and the grain protein average was 14.3%. (All hard spring wheat trials are top-dressed at flowering with 40 units of N to promote higher protein hard spring wheat.) The ratio of available and applied N (312 lbs N/A) to average bushel yield (127) was 2.5 lbs N/bu with an average site grain protein of 13.9%. Heading dates for the hard red spring wheat average 6/17, 3 days earlier than in 2022. Yields were 10 bu/A greater than 2022, 18 bu/A greater than 2021, and 30 bu/A greater than in 2020.

The soft white spring wheat yields at Aberdeen (Table 39) averaged 140 bu/A with a range from 115 bu/A (Hedge CL+) to 154 bu/A (UI Stone). The average yield was 27 bu/A greater than 2022 and 26 bu/A higher than 2021. Highest yields of lines and named varieties were obtained from UI Stone (154 bu/A), WB6430 (150 bu/A) and Alturas (147 bu/A). The heading date of 6/7 was 15 days earlier than 2022 (6/22) and was 8 days later than 2021 (6/15). There was higher than usual lodging averaging 16% and test weights averaged 57.6 lbs/bu, very low in comparison to most years due to sprout damage. The ratio of available and applied N (296 lbs N/A) to average bushel yield (140 bu) was 2.1 lbs N/bu with an average site grain protein of 11.5%.

Two-rowed malt barley lines yield average was 20 bu/A greater than in 2022, and 7 bu/A greater compared to 2021 (Table 48). Yield ranged from 123 bu/A (Conrad) to 178 bu/A (BC Lexy). The top yielding lines were BC Lexy (178 bu/A), Esmá (173 bu/A), LCS Odyssey (160 bu/), BC Leandra (160 bu/A) and GemCraft (149 bu/A). The average heading date (6/22) was 2 days later than the average from the previous ten years (Table 3), and 3 days earlier than 2022. Lodging averaged 30%. The ratio of available and applied N (296 lbs N/A) to average bushel yield (147 bu/A) was 2.0 lbs N/bu with an average site grain protein of 11.5%.

The average yield for two-rowed feed barley in Aberdeen for 2022 (Table 57) was 162 bu/A, 31 bu/A greater than 2022, and 20 bu/A greater than 2021. The high yielding two-rowed feed varieties were Altorado (176 bu/A), Oreana (170 bu/A), and Carleton (164 bu/A). Average test weight for this trial was 49.5 lbs/bu. The hulless, high beta-glucan food barleys Julie, Goldenhart, and Transit yielded 110, 98, and 98 bu/A but also

had high test weights (58.1, 57.5 and 56.3 lbs/bu, respectively). Kardia is hulled with lower test weight than the hulless lines, but with substantially higher yields (139 bu/A). The heading date for this trial was 6/21 for the feed lines, 1 day earlier than 2022 (6/22), and 6/26 for the food lines, the same as in 2022. Lodging averaged about 44% for the feed lines and 10% for the food lines. For this trial, the ratio of available and applied N (272 lbs N/A) to average bushel yield (162 bu/A) was 1.7 lbs N/bu with an average site grain protein of 13.4% for the feed lines and 2.7 lbs N/bu for the food lines with 14.3% grain protein.

### **Idaho Falls, Marc Thiel, Irrigated Spring Grain**

The Idaho Falls wheat plot site followed potatoes and was in a field of spring barley. Plots were planted May 4<sup>th</sup>, 15 days later than in 2022 and 18 days later than in 2021. Plots were planted in silt loam soils with good soil moisture and harvested August 30<sup>th</sup>. There were no major weather-related problems but bacterial streak damaged the barley.

Average grain yield for the hard spring wheat (Table 31) was 125 bu/A, 12 bu/A, greater than 2022, and 2 bushels more than 2021. Hard spring wheat ranged in yield from 106 (SY Gunsight) to 142 bu/A (Dayn). Average grain protein was at 13.3%, and test weight was at 60.1 lbs/bu. The five highest yielding named varieties were Dayn hard white (142 bu/A and 12.8% protein), WB9707 (134 bu/A and 13.2% protein), LCS Hammer AX (133 bu/A and 13.5% protein) and WB7313 (133 bu/A and 12.5% grain protein). Some varieties had some degree of lodging, which overall averaged less than 1%.

The high protein lines include MT1939 at 15% protein, WA8330 at 14.4%, MT1809 at

14.4%, WA8388CL+ at 14.1%, and WB9668 and Dagmar at 14.1%. Test weight was good overall, averaging 60.1 lbs/bu. The ratio of available and applied N (255 lbs N/A) to average bushel yield (125) was 2 lbs N/bu, resulting in good protein levels, but it could have been higher to meet hard red spring wheat protein goals.

IDO1902S, UI Stone, WB6430 and Ryan topped the yield chart (Table 40) for the soft white spring wheat varieties at Idaho Falls at 143, 143, 142 and 140 bu/A, respectively, with an overall average of 130 bu/A, 22 bu/A greater than 2022 and 2 bu/A greater than 2021. Yields ranged from 113 bu/A (WA 8325) to 143 bu/A. Test weight averages were good at 59.1 lbs/bu, and grain proteins were at 10.5%. The ratio of available and applied N (215 lbs N/A) to average bushel yield (130) was 1.7 lbs N/bu, low to meet the yield potential for higher yielding varieties but overall the grain protein was good for soft white spring wheat.

Two-rowed malt barley yields (Table 49) averaged 152 bu/A, about 23 bu/A greater than 2022, and 33 bu/A greater than 2021. The yield ranged from 138 (AC Metcalfe) to the highest yielding variety Esma which hit 170 bu/A. Other top yielding named varieties included BC Leandra (169 bu/A), ABI Eagle (160 bu/A), Moravian 179 (155 bu/A) and ABI Raptor (154 bu/A). Test weight average was good at 49.1 lbs/bu, protein average was 11.8% and lodging was high at 51%. The ratio of available and applied N (215 lbs N/A) to average bushel yield (152) was 1.4 lbs N/bu, indicating the amount of available N was adequate to not push protein level too high. Heading dates were averaging one day later than 2022.

Two-rowed feed barley trial (Table 58) averaged 147 bu/A, with the top yielding

lines averaging 165 bu/A (HO616-429). Altorado yielded 162 bu/A, Claymore yielded 162 bu/A and Champion 157 bu/A. The test weight average for the feed lines was 50.0 lbs/bu and protein average was 12.4%. The food barleys in the trial would bias the test weight averages higher so they were averaged separately. Test weight of the hullless lines averaged at 56.4 bu/A (with hulled Kardia, average at 48.9 lbs/bu) and the protein was at 14.1%.

### **Tetonia Research Center, Irrigated Spring Grain**

The Tetonia location was planted May 17<sup>th</sup>, eight days later than in 2022 in silt loam soil into good soil moisture following summer fallow. Barley plots were harvested September 13<sup>th</sup> and the wheat plots were harvested later on September 19<sup>th</sup>.

The average yield for the hard spring wheat (Table 32) was 108 bu/A, compared to 113 bu/A in 2022 and at 73 bu/A Ashton in 2021. Heading dates were 3 days earlier than in 2022, and 11 days later than the Ashton area in 2021. The range in yield varied from 92 bu/A (Dagmar) to 141 bu/A (WB9707). Test weights were average at 61.3 lbs/A, and protein averaged 12.0%. The high yielding named varieties were WB9707 (141 bu/A), SY Teton (128 bu/A) and AP Venom (127 bu/A). The highest proteins were seen in WB9707 (14.7%), WB9668 (at 14.1 %) and Dagmar (13.1%). The ratio of available and applied N (296 lbs N/A) to average bushel yield (108) was 2.7 lbs N/bu. The average protein levels for hard spring wheat was 12.0%. Proteins are relatively low, and additional N would be helpful to boost grain protein levels.

In the soft spring wheat trial (Table 41), the high yielding named varieties were the club wheat Melba (128 bu/A), WB6430 (127 bu/A), and Alturas (127 bu/A). The average

yield for the soft white spring trial was 116 bu/A, 4 bushels less than in 2022 (120 bu/A), 51 bu/A greater than the 2021 Ashton location, which was under weed pressure from wild oats. Yield ranged from a low of 92 bu/A (Hedge CL+) to a high of 128 bu/A (Melba). Heading dates averaged 7/13. One day earlier than in 2022 (7/14), and 16 days later than the 2021 heading date at Ashton. The test weight average was high at 61.2 lbs/A, with lodging occurring in Hedge CL+ (a club wheat) and in WA 8327. Grain protein averaged 10.5% (256 N available for 116 bu/A average yield). The ratio of 2.2 lbs N/bu resulted appropriate protein levels.

Two-rowed malt barley yields (Table 50) were 13 bushels lower than in 2022, and 7 bu/A higher than the 2021 trial in Ashton. Yield ranged from 114 bu/A (AC Metcalfe) to 144 bu/A (16ARS067-13). The average was 131 bu/A, with the highest yielding named lines being Esma (144 bu/A), BC Leandra (142 bu/A), and LCS Odyssey (139 bu/A). Lodging averaged 15%, with high lodging in some, as in AC Metcalfe with 60% lodging. Overall test weight was at 48.9 lbs/bu, protein averages were low at 11.2% and plumps were 96%. The N: bu ratio calculates as 2.0 lbs N/bu, indicating there was sufficient N for maximum yield and optimal protein.

The feed lines (Table 59) averaged 108 bu/A, 39 bu/A less than in 2022, and less than the 2021 trial at Ashton, with Oreana (115 bu/A), Claymore (114 bu/A) and Altorado (114 bu/A) as the top yielding varieties. The food barleys yielded an average of 87, 25 bu/A less than in 2022, and 11 bu/A less than the 2021 trial in Ashton. Kardia is a hulled, high beta-glucan food line. The hulled lines had a test weight of 50.0 lbs/bu and hullless lines had a test weight of 58.2 lbs/bu. Proteins of the feed lines averaged 10.3%, with a N:bu ratio of

2.4 lbs N/bu, while the food barley lines averaged 12.2% protein and a N/bu ratio of 2.9. Additional N would be required to meet yield and protein goals of the feed and food lines.

### **Soda Springs, Kyle Wangemann and Scott Brown, Dryland Spring Grain**

The only spring dryland extension trials were in Soda Springs. The nursery was planted May 19<sup>th</sup>, one day earlier than in 2022 and 15 days later than in 2021. The previous crop was spring barley and plots were planted into good soil moisture. Hail in July damaged this location, with additional precipitation delaying harvest and crop maturity. Barley and wheat plots were harvested September 8<sup>th</sup> and were very high in grain moisture. Grain samples had to be dried and cleaned to obtain accurate test weights, and many of the wheat samples had green shriveled kernels.

Yield averages for the hard red and hard white spring nursery (Table 33) were 47 bu/A, 22 bu/a greater than in 2022, and 29 bu/A greater than 2021. The range in yield went from 36 bu/A (WB9724CLP) to 58 bu/A (Hale). The five highest yielding named varieties were Hale (58 bu/A), the hard white SY Teton (56 bu/A), Alum (56 bu/A), the hard white Dayn (56 bu/A), the hard red Net CL+ (55 bu/A) and hard red SY Gunsight (52 bu/A). The average heading dates at this location were 7/13, 2 days later than in 2022, and 12 days later than in 2021. Test weights averaged 60.8 lbs/bu, and proteins were a little low to good, averaging 12.6%. The varieties with the best combination of protein and test weight include WA 8388CL+ (61.2 lbs/bu and 14.3% grain protein), Holmes (61.1 lbs/bu and 13.7% grain protein) and Rocker (61.5 lbs/bu and 13.5% grain protein).

For the soft white spring wheat (Table 42), the nursery averaged 52 bu/A, 21 bu/A greater than in 2022, and 29 bu/A greater than 2021. The yield ranged from 41 (Tekoa) to 64 bu/A (UI Stone). UI Stone, AP Coachman, Hedge CL+, Louise and Melba were the five top yielding varieties at 64, 61, 59, 57 and 54 bu/A, respectively. Test weight average was at 59.6 lbs/bu, and proteins were at 10.6%.

Replicated dryland barley trials were added to Soda Springs trials in 2018. Two-rowed malt barley yields (Table 51) ranged from 46 bu/A (Moravian 179) to 66 bu/A (17ARS072-5). The average was 55 bu/A, 12 bu/A greater than in 2022 and 31 bu/A greater than 2021. The highest yielding named lines were Esma, GemCraft and Moravian 69. There was no lodging, overall test weight was 48.9 lbs/bu and plumps were 97%. Protein averages were an acceptable 11.6%, although some varieties ran a little high for acceptable targets.

The feed lines averaged 59 bu/A, 11 bushels greater than in 2022, and 39 bu/A greater than in 2021. The highest yielding named varieties included Oreana (59 bu/A), Altorado (58 bu/A), Claymore (56 bu/A) and Champion (56 bu/A) (Table 60). The food barleys yielded an average of 43 bu/A, 8 bushels greater than 2022 and 29 bu/A greater than in 2021. Kardia is a hulled, high beta-glucan food line, with a test weight of 48.7 lbs/bu and the hullless lines had a test weight of 56.6 lbs/bu. Proteins of the feed lines averaged 12%, and of the food lines, proteins averaged 11.0%.

## Table 2. Variety Descriptions

### SPRING BARLEY - Malt

**AAC Prairie (TR17255)** – released in 2022 by Agriculture and AgriFood in Manitoba, Canada, AAC Prairie is a two-rowed malt barley with a quality profile similar to AC Metcalfe. Marketed in the U.S. by Canterra Seeds, AAC Prairie has very high enzyme activity with yields greater than Metcalfe and Copeland, but less than Synergy. It is a mid-maturity line that is shorter than Metcalfe with better lodging resistance, but under irrigated conditions lodging was high (46% see Table 46). Yields were similar to Moravian 69 and Moravian 179. It is intermediate in resistance to spot form of net blotch and Fusarium Head Blight (FHB) and carries the Rpg1 resistance gene for stem rust.

**ABI Eagle (2B11-4949)** – a newer release by Busch Agricultural Resources (2018), Eagle is a two-rowed barley that has been tested in the variety trials for six years. Yield was greater than to ABI Voyager with the 3-yr average yield 9 bu/a greater than ABI Voyager (Table 44). ABI Eagle should replace Merit 57, having similar levels of test weight, grain protein and heading date, 2-4 inches shorter, with higher plumps. Lodging was a little less than Merit 57 and Voyager. FHB reaction has been moderately susceptible.

**ABI Raptor (2IM14-8212)** – a two-rowed malting barley released in 2022 by AB InBev, ABI Raptor has been in program testing for four years. Yields have been intermediate between Voyager and Eagle with lower test weight. Heading is earlier than Eagle, similar to Voyager, is three inches shorter than Voyager, has better lodging resistance and lower in grain protein. FHB tolerance is similar to

Voyager, and both are improved over ABI Eagle.

**ABI Voyager (B3719)** – a 2011 release from Busch Agricultural Resources, Voyager yields were below the average of 3-year irrigated trials (Table 44), below ABI Eagle and LCS Odyssey and similar to CDC Copeland, with similar percent lodging and test weight. ABI Voyager is similar to Conrad in test weight, has a little earlier heading date (2 d), lower protein, but is taller (1-4 inches). ABI Voyager is susceptible to cereal cyst nematode (CCN), MR to MS to FHB and shows average levels in ppm of DON.

**AC Metcalfe (TR232)** – two-rowed malting barley released in 1994 by Agriculture and Agri-Food Canada with excellent quality, lower yield potential than average (90% of 2023 trial average, Table 52 and Chart 7), and 2-4 inches taller with similar test weight and higher lodging to Conrad. It is widely adapted to western US and Canadian conditions, but it is tall, it lodges under higher production conditions. It is MS to S to FHB with average DON accumulation. Malting quality and extract are excellent.

**BC Leandra** – a two-rowed European malt variety under testing in Idaho for Limagrain Cereal Seeds. BC Leandra was developed in Germany by Breun Craft, targeted for the German all-malt style beers. BC Leandra averaged 110% of trial average for yield across all locations in 2023 trials (Table 52), yielding similar to Esma and LCS Odyssey in the 3-yr average (Table 49). Test weights were a little below and plumps were at average (Table 44). Yields were 19 bu/A greater than ABI Voyager, with 4 d later maturity and 7-8 inches shorter. Initial FHB testing showed BC Leandra to be MS to S for FHB.

**BC Lexy** - a two-rowed European malt variety under the second year of testing in Idaho for Limagrain Cereal Seeds. BC Lexy yields were 109% of trial average in 2023 (Table 52) and 107% of trial averages in 2022. BC Lexy is short with lower test weight, lodging, grain protein and plumps in comparison to 3-yr trial averages (Table 44).

**CDC Copeland (TR150)** – a two-rowed malt variety developed by the Crop Development Centre, University of Saskatchewan and released in 1999, Copeland has been in the trials since 2009 in southern Idaho. Copeland yields are similar to Conrad and AC Metcalfe (Table 49). Copeland was 3-6 inches taller than average with greater lodging and was at average for grain protein and plumps, with good test weight. In FHB screening trials, CDC Copeland is MR-MS for FHB infection and had low-to-average DON levels in the grain.

**Conrad (B5057)** – two-rowed spring malt barley released by Busch Agricultural Resources in 2005. Conrad has below average yields (91% of trial average in 2023), good test weight and end use quality. Conrad is tall in height (1-4 inches shorter than ABI Voyager), is average to greater in lodging and protein. Conrad yields were below average in the dry land upper elevation areas (Table 45). Conrad has low disease measures for FHB (moderately resistant) but medium to higher seed-levels of DON accumulation.

**Esma** – entered into the trials in 2018 by Ackermann Saatzucht GmbH & Co. KG, Esma is the highest yielding two-rowed malt variety over several years, averaging 114% of average for yield in 2023. Over the past three years, Esma has yielded 152 bu/A over all irrigated trials (Table 44). Esma has good test weight, average heading date, is 3-4 inches shorter with lower lodging than

average. Esma has good malt quality with low beta-glucan, high extract, and good FAN potential. Esma is MS to S to FHB. Like many of the European malt types, Esma is suited for the craft beer market.

**GemCraft (2Ab08-X05M010-65)** – released by the USDA-ARS and Idaho AES in 2018, GemCraft is a PVP 2-row malt barley released for the craft industry and favored by the Brewers Association due to its good taste profile. Yields over the previous three years were a little greater trial average, similar to ABI Eagle and LCS Genie (Table 44). Test weight was slightly below trial averages. Height and heading date were similar to ABI Eagle, with lower plumps. Lodging tends to be greater under irrigated production systems. GemCraft is MS to S to FHB.

**LCS Diablo** – LCS Diablo is a non-GN producer (glycosidic nitrile) that was released for dual-purpose malting and brewing with excellent yield potential. Barley varieties used for distilling require low to no GN in the grain. Diablo is a two-rowed malt marketed in the US through LCS. Heading dates were late, similar to CDC Copeland, and 2022 test weights were low – probably affected by high temperatures. Test weights in 2023 were also lower than average. Yield was slightly above average, similar to GemCraft, with lower test weight and later maturity (Table 46). Grain protein and plumps were good. LCS Diablo has good disease resistance, excellent malting quality with high hot water extract and low grain nitrogen.

**LCS Genie** – a European malt barley released in the U.S. through Limagrain Cereal Seeds, Genie is a short-statured two-rowed malt variety with yields and test weight similar to ABI Voyager (Table 46). Protein was lower and plumps were similar

to ABI Voyager. LCS Genie is about 1-3 inches shorter than average with average lodging. Genie is susceptible to FHB and had high levels of DON in seed in the FHB disease nurseries. Genie has excellent malt quality and as a low GN variety, can also be used in distilling.

**LCS Odyssey (NSL08-4556-A)** – LCS Odyssey is a European two-rowed malt barley released and distributed through Limagrain Cereal Seeds. In the past three years of testing, LCS Odyssey was in the group of high yielding varieties, greater than ABI Eagle and Voyager (Table 44). Test weights were slightly lower than average with average lodging, even as LCS Odyssey is 3-5 inches shorter than the trial average. Heading date is 1-3 days later than average with below average proteins and good plumps. LCS Odyssey is more susceptible than current U.S. malt varieties for FHB and had higher levels of DON accumulation in harvested grain. LCS Odyssey has excellent resistance to cereal cyst nematode (CCN) and is resistant to PNW races of barley stripe rust. Odyssey has excellent malt quality for all-malt brewing with dual usage in distilling (as a low-GN or glycosidic nitrile variety).

**Merit 57 (2B99-2657)** – considered one of the industry standards for malt quality, Merit 57 was released in 2009 by Busch Agricultural Resources. Merit 57 is a later maturity two-rowed malt variety with small seed, lower yields, lower test weight and higher lodging than average. Merit 57 has good plumps and protein. In 2023, irrigated average yield of Merit 57 was at 91% (Table 52) of trial average. Merit 57 is moderately resistant to moderately susceptible to FHB and DON accumulation is at average.

**Moravian 69 (C69)** - two-rowed spring malt barley released by Molson Coors

Beverage Co. in 2005. Moravian 69 (M69) has very high yield potential, especially in the Magic Valley area where it is widely grown, with 3-year yield over all locations similar to CDC Copeland and Conrad (Table 44). M69 is short (2-4 inches below average) but may still be susceptible to lodging. Protein, test weight and plumps are at average in these trials. Moravian 69 is considered more susceptible to FHB with higher-than-average accumulation of DON in the seed.

**Moravian 179** – Moravian 179 is a two-rowed malt line from Molson Coors adapted to the higher production conditions of southern Idaho. Yields of Moravian 179 tend to be higher than Moravian 69 with lower lodging but higher protein. Three-year yields were similar to ABI Eagle and GemCraft averaged over 3-yr irrigated locations; however, Moravian 179 was not included at the Ashton location in 2021 so the average may be skewed slightly higher (Table 44). Overall locations in the cooler year of 2023, M179 yields were at 95% of trial averages (Table 52). Moravian 179 had high plumps, good test weight and average lodging. Proteins were close to trial average, with plant height similar to Moravian 69 and 2-4 inches shorter than average. Molson Coors lines are under Title V and PVP.

## **SPRING BARLEY – Food**

**Goldenhart (2Ab09-X06F058HL-31)** – Released by the USDA-ARS in Aberdeen in 2018, Goldenhart is a spring two-rowed hullless food barley with beta-glucan content similar to Transit (9-10%) released for significantly increased yield potential under dry land conditions. Three-year averages for irrigated production (Table 53) put Goldenhart slightly lower in yield than Transit. In 2023, yields were significantly

less than Transit at all locations except Aberdeen (Table 61). Goldenhart has very high test weight and protein (Table 53) as expected for hulless barley. Goldenhart and the hulless barleys are MS to S to FHB and DON accumulation. PVP was applied for Goldenhart.

**Julie (03AH6561-94)** – a two-rowed hulless food barley released by the USDA-ARS and the University of Idaho AES in 2010 for high-beta-glucan content and intended for human consumption. Julie has high test weight (due to the hulless characteristic) and protein, similar to other food barleys, with greater percentage of beta-glucan (averaging 7%) in the seed than previous industry standards such as CDC McGwire. Julie is the highest yielding hulless waxy barley currently in the trials (Table 53). Lodging of Julie is less than average and heading date 4-5 days later than Champion. Julie and the hulless barleys are MS to S to FHB and DON accumulation. Careful handling of all hulless barleys prior to planting reduces germ damage and protects seedling stand establishment.

**Kardia (2Ab09-X06F084-51)** – Kardia is a two-rowed, hulled food barley line released in 2016 by the USDA-ARS in Aberdeen and the University of Idaho AES as a replacement for Salute, with yield improvement of 4-5% over Salute. Yield (3-years, Table 53) of Kardia was greater than Julie, Transit and Goldenhart (all hulless). The beta-glucan level of Kardia is 7- 8.5% compared to 6.5% in Salute. Kardia is MS to S to FHB and as a hulled line has lower test weight than the hulless food barley. Yields in 2023 were 122% of trial averages (Table 61) which included feed lines.

**Transit (03AH3054-51)** – a two-rowed hulless food variety released by the USDA-ARS and the University of Idaho AES in

2010 for high-beta glucan content (waxy) and intended for human consumption. Seed beta-glucan content (9-10%) is higher than other previous industry standards such as CDC Fibar and CDC McGwire. Transit yields are lower or similar to Julie but the percent beta-glucan is higher than Julie. In the Extension Variety Trials, Transit consistently yields better than Goldenhart under irrigated and dryland conditions. As expected for a hulless line, test weights are high for barley. Transit and the hulless barleys are susceptible to FHB and DON accumulation.

### **SPRING BARLEY – Feed**

**Altorado (BZ509-601)** – Altorado is a 2016 release from Highland Specialty Grains. Altorado is a two-rowed feed barley with very high yield potential. Irrigated 3-yr average yield was greater than Champion with comparable high test weight (Table 53). Altorado is similar to Champion in disease resistance, test weight, plant height, and lodging with lower in grain protein. Altorado's heading date averaged two days later than Champion. In 2023, yield was 130% of trial average, in 2022, yield was 119% of average, and in 2021 yields were 123% of trial average. The trial averages include the lower yielding food lines. In the hot summer of 2022, Altorado's irrigated yield was less than Oreana.

**Carleton (HO517-245)** – Carleton is a two-rowed feed barley with very high yield potential, released in 2022 by Highland Specialty Grains as a replacement for Oreana. This is the second year in the UI trials, but it has been extensively tested in Montana and Canada. (TR20761 is the co-op testing number for Carleton in the Canadian regional trials.) Carleton is taller than Oreana by about 1-2 inches and tends to have better standability. Under irrigation

in these trials, lodging was similar to Oreana. Carleton has much better FHB tolerance and less DON accumulation than Oreana and is earlier in heading date. Carleton is more tolerant of drought stress and yields were higher than Oreana in Soda Springs (Table 60).

**Champion (YU501-385)** – a 2007 release from WestBred, LLC, now handled by Highland Specialty Grains. Champion is a very high yielding two-rowed spring feed barley with excellent test weight. Combined over locations and years, Champion yields were above trial average, which included lower yielding food barleys. Champion has slightly greater than average height, less than average protein, and heads 1-3 days earlier than trial average. Champion is MR to MS to FHB.

**Claymore (BZ509-216)** – two-rowed spring feed barley from Highland Specialty Grains released in 2015. In three-year averages, Claymore consistently is in the top yielding group of feed lines, comparable to Altorado and Oreana. Claymore is tall and similar in height to Champion (Table 53), is 2-3 days later in heading, with lower test weight. In 2023, yields were 126% of average, in 2022, yields were 122% of average, and in 2021, yields of Claymore were 117% of trial averages, which includes the low yielding food lines. Claymore has good FHB tolerance (MR to MS).

**Diamondback (YU510-599d)** – a new six-rowed spring barley line released in 2021 from Highland Specialty Grains, Diamondback yielded less than Champion and Idagold II over three years (Table 53). It was earlier than average for heading, short, with high grain protein and poor test weight.

**Idagold II (C32)** – a two-rowed spring feed and malt line developed by Molson Coors

Beverage Company in Burley and released in 2002. Idagold II is a short line with average lodging and good test weight. Protein is average with higher than average plumps (Table 53). Idagold II is susceptible to FHB and showed higher levels of DON accumulation in the seed. Idagold II is used in these trials for fill plots and for its short stature.

**Oreana (BZ509-448)** – a short, two-rowed spring feed barley developed by Highland Specialty Grains. In three-year data averages (Table 53), Oreana had good test weight, excellent yields similar to Altorado and Claymore, and was 4-5 inches shorter than average, an unusual combination of high yield and short plant height. Oreana showed moderate susceptibility to PNW races of stripe rust, very susceptible reaction to FHB and showed higher levels of DON accumulated in the seed. Oreana yields in 2022 were the highest of the feed lines, and in 2023 were 126% of trial average (Table 61 and Chart 7).

**WINTER BARLEY – Malt, Feed, Food DATA reported is from 2022. Winter kill extensively damaged 2023 trials.**

**Avalon** – a winter two-rowed malting variety released in 2020 from Virginia Tech. It is VA Tech's first two-rowed winter malt barley and first tested in Idaho's program in 2021. Despite good spring stands, Avalon's yield performance in 2022 was at 82% of location average, and similar to the hullless food barley Upspring. In 2023, survival was very poor (Table 25). Avalon's test weight was excellent (52.2 lbs/bu), plumps were excellent, headed two days earlier than average, and despite being very tall, had good lodging resistance (2022 data). Avalon exhibits yield stability when grown in the

mid-Atlantic region and has good resistance against major leaf diseases.

**BC Clementine** – a two-rowed winter barley developed in Germany by Breun Craft, targeted for the German all-malt style beers. Clementine yields averaging 225 bu/A in Aberdeen (2022) without significant lodging. In the first year of the trials, Clementine had excellent plump, but higher protein and lower test weight. Averaged over both locations, yields were 119% of trial averages (in 2022). Winter survival was very good in comparison to trial average (Table 25).

**BC Fay** – another winter barley developed in Germany by Breun Craft, targeted for the German all-malt style beers. Fay is a two-rowed barley with good disease resistance (fungal and viral). Yields in Aberdeen (2022) were 214 bu/A with excellent test weight and high percentage plumps. Fay had higher lodging than Clementine and higher grain protein. Winter survival was very good in comparison to trial average (Table 25).

**Charles (94Ab1274)** – Charles is the first AMBA approved two-rowed winter malt variety released by the USDA-ARS and the IAES in 2005. Charles' average yields and test weights are lower than the winter variety average, yielding 91% of trial average in 2022. Charles is shorter than the average, earlier maturing and has a tendency to lodge. Charles has lower plumps but yields very well in the Twin Falls area, even when harsh winter conditions reduce stand as in 2020 near Rupert and 2023 in both Rupert and Aberdeen. Both Charles and Endeavor can suffer significant stand losses under cold, dry winter conditions. For improved winter survival, Charles and Endeavor do best when protected from cold dry winter winds and with good soil moisture prior to entering winter conditions.

**Eight-Twelve** – a six-rowed winter feed barley released by the USDA-ARS and the Idaho AES in 1991. Eight-Twelve yields averaged 149 bu/A under irrigation in 2020-2022, and 99% of trial average in 2022. Usually a high yielding variety, Eight-Twelve did not perform well in the higher temperatures of 2021 and 2022. Eight-Twelve has good winter survival but may lodge under high production conditions. Winter survival in 2023 was above average, but lower than the European varieties and Thunder (Table 25).

**Endeavor (95Ab2299)** – Endeavor is the second two-rowed winter malt variety released by the USDA-ARS and the Idaho AES approved by AMBA for malt quality. Released in 2008, Endeavor has improved test weight, malt quality and yield over Charles, especially in the Magic Valley area where winter kill is less of a problem than in eastern Idaho. Endeavor has good test weight and protein but had relatively low plumps for malt. Yield are low, like Charles, and both were at 91% of trial average (2022). For improved winter survival, Endeavor and Charles do best when protected from cold dry winter winds and with good soil moisture prior to entering winter conditions. Winter survival in 2023 was very poor (Table 25).

**Flavia** – developed in Germany by Ackerman Saatzucht and carried through Virginia Tech, Flavia was first tested in 2020-21 trials. Flavia is a two-rowed winter malt that is early maturing, 2-5 days earlier than Wintmalt and 1-2 days earlier than Charles. Yields were comparable to Thunder with higher test weight. Lodging resistance was good and proteins were slightly higher than trial average. Winter survival in 2023 was higher than average (Table 25), similar to Thunder.

**NOTE: Winter barley data reported is from 2022. Winter kill extensively damaged 2023 trials.**

**Hirondella** – also developed in Germany by Ackerman Saatzucht and carried through Virginia Tech, Hirondella was first tested in 2020-21 trials. Yields in the first year of testing of this two-rowed winter malt were 104% of location averages, doing very well in Rupert at 114% of trial average in 2021. In 2022, yields below average and similar to Lightning and Wintmalt, with lower test weight. Like Flavia, Hirondella is earlier than Wintmalt and a little earlier than Endeavor. It has resistance to loose smut, stem rust, net blotch, leaf rust, spot blotch, powdery mildew, BSMV, and BYDV. Hirondella had lower test weight, protein and plumps than Flavia. Winter survival in 2023 was poor (Table 25).

**KWS Donau** –The variety KWS Donau is a two-rowed winter malt barley produced and released through KWS Lochow in Germany and marketed through KWS Cereals in the U.S. KWS Donau had very high yields, test weight and plumps in the three-year average results, doing very well in 2019 and 2020, but not as well in the hotter production year of 2021. In Aberdeen in 2022, yields hit 195 bu/A. Lodging was below average even though it was one of the yield leaders. Winter survival in 2023 was very good (Table 25), maturity was at the average, and proteins were at 11.6%, compared to the trial averages of 11.5% (2022). For end use quality, extract content for Donau is at the level of 81.4% with a low level of proteolytic and cytolytic modification, which is preferred in the craft brewing industry. KWS Donau had the highest stand in 2023.

**LCS Calypso** – is a two-rowed winter malt barley released by Limagrain Europe to replace LCS Violetta, having improved winter hardiness and yield and excellent

malt quality. In 2022, yields were similar to the feed barley Sunstar Pride at 101% of trial averages. Over three years, LCS Calypso yields were similar to Wintmalt, but with much better test weight. LCS Calypso has good test weight, was 2 inches taller than average with high grain protein and higher than average lodging. LCS Calypso had good winter survival in 2023 (Table 25).

**Lightning (DH130910)** – Lightning is a true facultative two-rowed winter malt barley developed through the doubled haploid program at Oregon State University under Pat Hayes. Lightning was in both the winter and spring trials in 2020, but in some locations did poorly in the spring trials. Winter conditions in Rupert for 2020 and 2023 were poor, resulting in low spring stands, and yields were below 2020 trial average. In 2022, Lightning performed at 99% of trial average. Over the previous three years (2020-2022), yield and lodging was a little below average, test weight and plumps were very good, protein and heading date were average. Winter survival in 2023 was about at trial average (Table 25).

**Marouetta** – a two-rowed winter malt barley developed in Germany by Ackerman Saatzucht and carried through Virginia Tech, Marouetta was tested for the first time in these trials in 2021-22. Plumps and protein were good and heading date was three days earlier than average; however yield was low, below that of the hullless winter food lines. In 2023, winter survival and yield were below trial averages (Table 25). Marouetta is very susceptible to FHB.

**Sunstar Pride (SDM204-B)** – a winter six-rowed feed barley released by Sunderman Breeding in 1995. Sunstar Pride consistently has been one of the highest yielding varieties in the trials, similar to the high-yielding European malt lines. Test weight,

protein, and plant height is below average. Heading date is up to a week to ten days later than average, with low plumps. Lodging is similar to trial averages. In 2023, winter survival and yield were below trial averages (Table 25).

**Thunder (10.0777)** – Thunder is an AMBA approved two-rowed winter malt release from Oregon State University (2016) with excellent yield potential and better winter survival than Charles and Endeavor. Thunder averaged 166 bu/A over the three-year summary (2020-22) with good test weight (lower than average but above 48 lbs/bu) and spring stand. In 2020 and 2023, poor winter conditions reduced spring stand, but in 2021, Thunder yielded 108% of trial averages and in 2022 Thunder yields were 113% of trial averages. Winter survival is one of the best of the US lines (Table 25). Heading date is three to five days earlier than the trial average and plant height is 2-5 inches less. Plumps and protein were very good although lodging was greater than trial averages, similar to Endeavor and Charles. Thunder is susceptible to preharvest sprouting, as are many of the winter and spring malt varieties.

**Upspring (05ARS748-270)** – Upspring is a hulless, high beta-glucan (7% BG) winter barley variety and the latest two-rowed food barley released from USDA-ARS breeding program in conjunction with the University of Idaho AES. Upspring was released as an alternative to Buck. While agronomically similar to Buck, Upspring had slightly higher yields. Upspring headed 3 days later than the trial average and had a poor spring stand compared to the hulled varieties. As a hulless barley, test weight approaches that of winter barley, at 59.2 lbs/bu averaged over 3 years (2020-22). Grain protein was 13.9%. Seed germination may be low under dry land conditions, and winter survival was

poor in 2020 and 2023 in both locations (Aberdeen and Rupert). Overall winter survival (measured as spring stand) was 79% in 2021, 95% in 2022 and 1% in 2023. Upspring was released under PVP.

**Wintmalt** – a two-rowed winter malt developed by KWS Lochow (Germany) and imported from Europe. Wintmalt is being produced in the PNW, has good foliar disease resistance, and is an AMBA approved malt variety. In the third-year summary (2020-22), Wintmalt's yield was similar to LCS Calypso and Sunstar Pride. Plant height and lodging were at trial average and protein was less than the average. Wintmalt test weight was at average, heading was 1 day later than average, and plumps were excellent. In 2023, winter survival and yield were very good in comparison to all other varieties (Table 25).

**NOTE: Winter barley data reported is from 2022. Winter kill extensively damaged 2023 trials.**

## **SPRING WHEAT – Soft White**

**Alturas (IDO526)** – a low-protein soft white spring wheat released by Idaho AES and USDA-ARS in 2002. Alturas has a partial waxy endosperm which may make it vulnerable to low falling numbers. Alturas is adapted to both irrigated and dry land conditions and yields run above average in irrigated trials (Table 35) and dryland conditions (Table 36), with average test weight and heading date. Plant height is a little taller than average. Alturas is susceptible to the current races of stripe rust and to FHB.

**AP Coachman (08PN2001-07)** – a dry land soft white spring from AgriPro / Syngenta Cereals was released in 2020. AP Coachman was tested in the dry land location (Soda Springs, Table 36) and yielded very well from 2019-2023 competing with UI Stone but with lower test weight. Coachman is slightly taller than average, with 3d later maturity than UI Stone, lower to average protein and lower test weight. AP Coachman has resistance to current races of stripe rust, Hessian fly and is susceptible to FHB.

**Butch CL+ (WA8345CL+)** – a soft white spring wheat named for the WSU cougar mascot, Butch, planting this spring Clearfield line will be important for replanting into winter wheat damaged from winter kill or snowmold. Clearfield wheats have 2-gene resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds in winter wheat production. In the second year of testing, yield was less than average under irrigated and dryland conditions. In 2023 in irrigated and dryland trials, Butch CL+ performed similar to Tekoa and UI Cookie for yield. Test weight was below trial average and it was 2-3 inches shorter than average.

**Hedge CL+ (WA 8295CL+)** – a spring club wheat released in 2020 by WSU and USDA-ARS in Pullman as a replacement for JD with two-gene tolerance to Beyond (imazamox) herbicide. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds. Clearfield spring wheats are mostly used behind winter wheat production where imazamox has been applied to reduce potential carryover damage from residual soil chemical. Designed for low rainfall production areas, Hedge CL+ was tested for the first time in 2021 in eastern Idaho EVT's. Irrigated yield and test weights in 2023

(Table 35) were less than Melba (also a club wheat), and yield averaged 92% of trial averages (Table 43) whereas Melba club averaged 103% of trial averages. Heading of Hedge CL+ was 4 days later than UI Stone, and it was 2-3 in taller. Hedge CL+ is susceptible to lodging under irrigated production. End use quality of Hedge CL+ is excellent. Stripe rust resistance is excellent, it has intermediate tolerance to high-acid, Aluminum soils, but Hedge CL+ is susceptible to Hessian Fly. (PVP pending).

**Louise (WA7921)** – soft white spring wheat released in 2004 from Washington State University's spring wheat breeding program and used as a long-term quality check for soft white spring wheat. Louise is a later maturity, tall wheat with below average yields and high lodging potential under irrigated conditions. Louise performed below average for yield under irrigated conditions over the three previous years. Under dryland conditions, yields were higher than WB6430 (Table 36). Louise is susceptible to stripe rust and very susceptible to FHB.

**Melba (WA8193)** – Melba is a spring club wheat developed by USDA-ARS in Pullman and released in conjunction with the Washington AES in 2016. Melba is one of the first club wheats with good yield performance in southeast Idaho, similar to UI Cookie under irrigation and better than UI Cookie under dryland conditions (Table 35, 36). Melba performed particularly well in 2020, and in 2021 yields were 105% of trial averages. In 2023, Melba did well in the upper elevation locations (Table 43). Melba is average in height, 4-5 days later in heading than UI Stone and UI Cookie, with low protein. Melba is resistant to stripe rust and very susceptible to FHB.

**Roger (WA8325)** – a spring club wheat released in 2022 from Washington State University, Roger was tested in 2021 in the UI EVT, with yields similar to Hedge CL+ and Louise. Roger was not tested in 2022. Roger is the first spring club wheat released with Hessian fly resistance. Roger has similar test weight, lower yield, and higher lodging than Melba (Table 37).

**Ryan (WA8214)** – Ryan is a partial waxy soft white spring wheat released from Washington State University, AES and USDA in 2016. Over the previous three years, Ryan irrigated yields were slightly below trial average and below Seahawk, over four irrigated locations (Table 35). Under dry land conditions, yield was similar to WB6430 and AP Coachman (Table 36). Ryan has Hessian fly resistance, tolerance to low acid / high aluminum soils, and HTAP (high temperature adult plant) resistance to stripe rust. Ryan was early to heading, similar to WB6430, was 1-2 in shorter than average, had lower test weight and may lodge a little under higher input environments.

**Seahawk (WA8162)** – a soft white spring wheat released from Washington State University's spring wheat breeding program in 2014 adapted to dry land and irrigated production areas. Seahawk has resistance to Hessian fly, is very resistant to stripe rust, and susceptible to FHB. Seahawk has tolerance to high aluminum, low pH soils. Yield is similar to UI Cookie under irrigation (Table 35) and higher in dryland production (Table 36) with better test weight. Plant height is a little above average and heading 3-5 days later than UI Stone. Seahawk may have a tendency to lodge under high production practices. Seahawk yielded 108% of trial average in 2021, 102% of trial averages in 2022, and 98% of trial averages in 2023 (Table 43).

**Tekoa (WA8189)** – a Washington State University 2016 release, Tekoa is a soft white spring wheat released for higher rainfall areas. Yields in 2021-23 were below average (Table 35). Tekoa did not yield as well in areas where irrigation was restricted at the end of the growing season. In 2023, yields averaged 92% of trial averages (Table 43). Tekoa is adapted to low pH soils where aluminum toxicity can occur. Tekoa has good test weight, is 5 days later in maturity (heading date) than UI Stone and a little higher to average for plant height. Tekoa is resistant to stripe rust, Hessian fly, and susceptible to FHB, similar to Seahawk.

**UI Cookie (IDO1405S)** – a soft white spring wheat released in 2019 by the University of Idaho Ag Experiment Station. Three-year irrigated averages (Table 35) show UI Cookie a little above trial average for yield, less than UI Stone, lower for test weight and higher for grain protein, but overall agronomically very similar to UI Stone. Yield performance under dry land conditions is below trial average (Table 36) and at 82% of trial average in dryland conditions (Table 43). UI Cookie has acceptable end use quality, similar or better resistance to FHB than UI Stone, better resistance to stripe rust and improved threshability over Stone.

**UI Stone (IDO599)** - a soft white spring wheat released by Idaho AES in 2012, UI Stone has good yield potential, similar to Alturas (Table 35). The 3-yr average for yield under dryland trials (Table 36) was equal to AP Coachman. In 2022, UI Stone performed at 107% of average yield and in 2023 performed at 109% of average (Table 43). UI Stone was selected for good end use quality and reduced FHB susceptibility (it carries the Fhb1 resistance gene). The FHB reaction in UI Stone is similar to Seahawk. UI Stone also has tolerance (not resistance)

to cereal cyst nematode and is susceptible to the current races of stripe rust. Test weight, height and lodging are close to average, heading is 2 days earlier than WB6430.

**WB6211CLP (XD6305)** - a soft white spring wheat intended for a replacement to WB-1035CL+, WB6211CLP is a Clearfield® Plus Variety from WestBred, with two-gene tolerance to Beyond (imazamox) herbicide. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® for hard-to-control grassy weeds. WB6211CLP has resistance to Hessian fly and good resistance to yellow (stripe) rust, much improved over WB3510CL+. WB6211CLP yields are below average for these trials, below Ryan and Tekoa (Table 35), yielding 95% of trial averages in 2023 (Table 43). Under dryland conditions, yield was similar to Seahawk (Table 36). Plant height of WB6211CLP is 2 inches taller than WB6430.

**WB6430 (BZ608-125)** – a soft white spring wheat released by WestBred (a unit of Bayer Crop Science) in 2014. WB6430 is a UI Pettit-type of soft white spring wheat with consistently high yield potential (Table 35), good test weight, and resistance to stripe rust. Maturity is slightly earlier than average and WB6430 is also 2-4 inches shorter than average with good straw strength (Table 35). WB6430 is moderately resistant to stripe rust and susceptible to FHB. FHB reaction for WB6430 is more susceptible than Seahawk (which is moderately susceptible) and has high levels of DON accumulation in the grain.

## **SPRING WHEAT – Hard White and Red**

**Alum (WA8166)** – hard red spring wheat released in 2015 by Washington State University’s Ag Experiment Station for tolerance to aluminum in low pH soils. Over the three years in the trials, Alum has had yields less than Jefferson HF for yield, has high test weight, and much higher in protein (Table 26). Alum heads about 1-3 days later than average, is 2-4 inches taller than average, and may lodge under high input production conditions. Alum is MR to MS to stripe rust and has moderate resistance to Hessian fly. Alum would be suited for the Ashton area (Table 32) where acidic soils are problematic, and it does well in dry land conditions (Table 27).

**AP Venom (USW112000083-1-3)** – Agripro / Syngenta released AP Venom, a tall hard red spring wheat, in Fall 2019 out of the California program. AP Venom is targeted for irrigated production, and in 2019 and 2020 yielded equally as well as AP Octane in the average of the irrigated trials. Venom has looked very strong in fall planted systems with good straw strength. AP Venom was dropped in 2021-22 and reentered into the trials in 2023. AP Venom yields were similar to Jefferson HF and UI Gold, was 4-5 inches taller than trial averages, and had low protein. AP Venom is considered an early maturity variety, however in 2023 heading dates at the upper elevation areas was very late (Table 32 and 33). AP Venom has resistance to stripe rust and BYDV but is susceptible to Hessian fly.

**Choteau (MT9920)** – is a semidwarf hard red spring wheat released by Montana State University in 2003. Choteau has the solid-stem characteristic, which contributes to resistance to the stem sawfly. Choteau yields were a little below average and similar to Jefferson under dry land conditions in Soda

Springs (Table 27). Choteau is similar in height to Jefferson and 2 d later in maturity. Choteau had average test weight, high protein and has acceptable end use quality.

**Dagmar (MTS1588)** – the dry land hard red spring wheat Dagmar is a 2019 release from Montana State University and in the first year of testing in the 2019 UI trials was the top yielding variety in Soda Springs. In 2020, Dagmar was included in the irrigated trials and yielded well over all and in Ashton and Soda Springs. In 2021, Dagmar yields were 106% of trial average, but in 2022, Dagmar was at 95% of yield average and in 2023, was 98% of average (Table 34 and Chart 5). Dagmar has good test weight, high protein, is early to medium maturity and was 2-4 inches taller than the irrigated trial average (Table 28). As Dagmar was bred for rainfed conditions, it will lodge under high production conditions and would benefit from growth regulators under irrigated production. Dagmar is PVP Title V and seed was available starting in 2021.

**Dayn (WA8123)** – Dayn is a hard white spring wheat released in 2012 by Washington AES and the USDA-ARS. Dayn is being handled in southern Idaho through Syngenta Cereals. Dayn was the highest yielding hard white spring wheat (Table 31) over the past eight years of the irrigated trials, yielding 113% of trial averages in 2023 (Table 34). Test weight and heading date were at trial average. Protein was a little below average. Dayn was 1-3 inches taller than average but has good lodging resistance. End use quality is acceptable. Dayn is resistant to stripe rust and among the “least susceptible” hard white spring wheat for FHB.

**Duclair (MT0832)** – a hard red spring developed and released by Montana AES in 2011, with solid stem characteristic that

reduces impact from wheat stem sawfly. It is adapted to southeast Idaho conditions for areas where wheat stem sawfly is a problem. Duclair is an awned semi-dwarf variety, similar to Choteau, with higher yield, heading 1-3 days earlier and about 1-3 inches taller, depending on the year. Yield of Duclair in Soda Springs was above trial average, comparable to UI Gold and SY Gunsight with excellent test weight (Table 33) and a lower protein. Duclair is PVP protected.

**Espresso (DA984-034SRR)** – a hard red spring wheat bred and released in 2006 by WestBred (Bayer CropScience) with good resistance to stripe rust. Espresso was included due to its susceptibility to low falling number (FN). Yield performance was similar to SY Gunsight (Table 26), with higher test weight, high protein and 1d later maturity. Espresso has high grain protein and medium plant height.

**Glee (WA8074)** – hard red spring wheat released in 2012 through Washington State University with desirable end use quality and resistance to stripe rust. Glee is included in the trial as a quality check. Yield of Glee is less than Alum in the irrigated trials (Table 26) and similar to Jefferson under dry land trials (Table 27). Glee has good test weight, is taller than average (4-5 inches taller than WB9668) and is average for percent seed protein.

**Hale (WA8315)** – a hard red spring wheat released from Washington State University in 2022, was the consistently highest yielding variety in WSU trials in the >20 in and 16-20 inches rainfall zones. Hale is resistant to Hessian fly, has high yields and has very good disease resistance and end-use quality. This is the first year in the UI EVT and yields were slightly below average. Hale had good test weight and grain protein was

at trial average. Hale performed very well under dryland conditions in Soda Springs, yielding 122% of trial yield average (Table 34) and having very good test weight (Table 33). Seed will be available in 2024.

**Holmes (BZ917-221)** – is a red-chaffed, hard red spring wheat developed by Nutrien Ag Solutions for the PNW, released in 2023. Holmes is a one-gene semi-dwarf with medium maturity. In 2021, yields averaged 103% of trial averages similar to WB7313 and WB9707. In 2022 yields were 101% of average, and in 2023, Holmes yields were 95% of trial average, doing well in the Rupert area (Table 34). Holmes has high test weight and grain protein averaging at 14% (Table 26). Heading date has been 1d earlier than WB9668 and is 2-3 inches taller. Holmes contains Yr36 and is MR to current races of stripe rust.

**Jefferson HF (IDO462)** – hard red spring wheat released by Idaho AES and USDA-ARS in 1998. Jefferson is primarily intended as a dry land variety due to it being taller than average (can be 3-4 inches taller than average under irrigation depending on the year) and susceptible to lodging. Irrigated and dry land yields have been at or above nursery averages (Table 26, 27). Jefferson has high test weight and good quality when there is adequate soil nitrogen and sulfur, when it has a minimum of 13% grain protein. Jefferson HF was developed from Jefferson but specifically selected for Hessian fly resistance for which it was segregating. Jefferson (HF) is susceptible to the current races of stripe rust and very susceptible to FHB.

**LCS Hammer AX** – LCS Hammer was released by Limagrain Cereal Seeds in 2022 and is the first hard red spring wheat with the CoAxiom herbicide resistance trait. It has medium plant height, good test weight,

and intermediate resistance to FHB. The area of adaptation is considered the MonDak region and tested at trial average for grain protein and above trial average for yield (Table 28 and Table 34)). This is the second year of testing in UI EVTs and LCS Hammer AX was 101% of trial average for yield, was 1d later and 1 inch shorter than average.

**Net CL+ (WA8280 CL+)** – a 2019 release from Washington State University, Net CL+ is a hard red spring, two-gene Clearfield variety (having Als1 and Als2). Net CL+ has good end use quality and is intended for dry land production. Under irrigation in the 3-yr summary (Table 26), Net CL+ yields were below trial average and similar to WB9668. Net CL+ headed 3-4 days later and is up to 4 inches taller than average (depending on year) with good grain protein. Net CL+ may have a tendency to lodge under higher production conditions. Yield, proteins and test weight were above average under dryland conditions (Table 27).

**Rocker (BZ917-277)** – a hard red spring wheat being released in 2022 by Nutrien Ag Solutions for dryland production with very high test weight and proteins even under very droughty conditions in Soda Springs (Table 33). Yield was 94% of average in 2023 (Table 34), similar to LCS Hammer AX and Holmes, and heading date was 3 d later than average with higher protein. Plant height is at the trial average (Table 27). Rocker was selected for tolerance to wheat stem sawfly.

**SY Gunsight (06PN3015-08)** – Syngenta released this hard red spring in 2016. Average three-year yields were less than SY Teton and greater than Alum (Table 26). Test weight and grain protein of SY Gunsight are less than average, with later heading dates than Jefferson. It is

moderately ‘resistant’ stripe rust and to FHB under lower disease pressure, and susceptible to Hessian fly. Grain protein is slightly below average, requiring top dress nitrogen at flowering to hit hard red spring protein targets.

**SY Teton (SY10136)** – Syngenta Cereals released this hard white spring wheat in 2015. In the 2019-2021 three-year averages, SY Teton was one of the highest yielding of the hard white and hard red spring wheat group, although performance was only 99% of average in 2022 (Table 39) under high heat conditions during grain fill. In 2023, SY Teton averaged 108% of trial average (Table 34), doing well in Tetonia and Soda Springs. SY Teton was 9 bu/A less than Dayn for yield, with lower test weight and 3-4 inches shorter (Table 26) but with better end-use quality. Heading date is 1-2 d earlier than average, and grain protein is less than average but good for a hard white wheat. Reaction to head blight was similar to Dayn, which was less susceptible than the majority of hard white spring wheat varieties. SY Teton is moderately susceptible to stripe rust and may lodge at higher seeding rates.

**UI Gold (IDO1804S)** – Hard white spring wheat released from UI breeding program in 2022, UI Gold has had consistently high yields under irrigated trials in southern Idaho, comparable agronomically to Dayn (Table 26) with better end-use quality. UI Gold is similar to Dayn in plant height and grain protein, with lower test weight and 3 days later in heading date. Both are susceptible to FHB, as are most hard white spring wheats.

**UI Platinum (IDO694C)** – a University of Idaho (IAES) hard white spring wheat, UI Platinum yields were below average with very good end use quality, lower test weight (due to sprout damage) in 2023 and good

lodging resistance. Over the last three years, yield has been similar to WB7589 with similar test weight, lower protein and heading 3d earlier (Table 26). In some environments, UI Platinum will show dark chaff discoloration similar to black chaff infection, which is not a disease but a genetic trait called melanism. UI Platinum is susceptible to stripe rust and very susceptible to FHB.

**WB7202CLP (XA7320)** – a hard white spring wheat released by Westbred (a unit of Bayer Crop Science) in 2017. In the three-year summary, the dryland yield average of WB7202CLP was similar to Jefferson HF and was at 102% of trial average in 2023 (Table 34). Test weight was below trial average, heading date was 2-3 days earlier than trial average, and WB7202CLP was 2-3 inches shorter. WB7202CLP is a two-gene Clearfield wheat with tolerance to imazamox herbicide Beyond®. Additional use of *spring* Clearfield tolerant wheat includes planting following beans where imazamox may have a residual presence in the soil, or to reduce wheat red volunteer in white spring wheat production. The FHB reaction of WB7202CLP was susceptible, similar to Snow Crest and UI Stone

**WB7313 (XD9201)** - the most recently released hard white spring wheat from WestBred, WB7313 has greater yield potential than WB7589 and WB7696. Yield of WB7313 exceeded that of all other hard white spring wheats except Dayn and UI Gold across irrigated locations (Table 26). In 2022 yields were 108% of trial averages, and in 2023 yield was 101% of trial yield averages. Grain protein and test weight were at trial averages, and WB7313 headed two days earlier than Dayn, was 4 in shorter and had higher grain protein. WB7313 has good end use quality, resistance to stripe rust and similar FHB tolerance to Dayn.

**WB7589 (BZ9S09-0735W)** – a short-statured, hard white spring wheat most similar to Klasic in agronomic and end use quality. WB7589 was released in 2015 by WestBred (a unit of Bayer Crop Science) as a replacement for Klasic, having better resistance to stripe rust and higher yield potential. WB7589 yields are similar to UI Platinum (Table 26) with similar test weight. Under heavy disease pressure, WB7589 was moderately resistant to stripe rust in 2016. Like all hard white spring wheat, WB7589 is susceptible to FHB.

**WB7696 (XB9512)** – a hard white spring wheat released in 2018 by WestBred (Bayer Crop Science), WB7696 was first tested in these trials in 2019, with yields and test weights similar to Jefferson HF (Table 26). WB7696 has good test weight, is mid-maturity with lower-than-average protein. Three-year irrigated yields were 6 bu/A greater than WB7589, is 3 in taller, with lower grain protein and higher test weight.

**WB9668 (BZ908-552)** – a hard red spring wheat, WB9668 has been tested in the trials since 2014. Three-year data shows WB9668 to be lower than average for yield with good test weight and grain protein (Table 26) but yields very well under typical production conditions. WB9668 is 2-4 inches shorter than average, has lower lodging and an average heading date. WB9668 is very resistant to the current races of stripe rust and moderately susceptible to susceptible to FHB. WB9668 is also among the most resistant hard red spring wheats for cereal cyst nematodes (CCN).

**WB9707 (XC9304)** – WB9707 is a hard red spring wheat released by Westbred / Bayer Crop Science in 2020. In the fourth year of trial testing, WB9707 yields were above trial averages (Table 26) and greater than WB7696 and Jefferson HF, with higher test

weight (61.0 lbs/bu) and grain protein (14.1%). Yield averages for WB9709 in 2023 were at 115% of average (Table 34). WB9707 has excellent test weight and even in a hot year (2021) where trial test weight averaged 58.7 lbs/bu, test weight of WB9707 was 60 lbs/bu with 14.2% grain protein in irrigated trials. Heading was similar to Jefferson HF, and WB9707 is 1 in taller. WB9707 has resistance to stripe rust.

**WB9724CLP (XD9315)** – is a two-gene Clearfield hard red spring wheat with tolerance to imazamox herbicide Beyond®. Additional use of spring Clearfield tolerant wheat includes planting following beans where imazamox may have a residual presence in the soil, or to reduce wheat red volunteer in white spring wheat production. WB9724CLP yields have been below average under dryland and irrigated conditions (93% of trial averages (Table 34), but with good protein and test weight. WB9724CLP is shorter than the trial average and has a heading date 1 d earlier than Jefferson HF (Table 28).

**WB9879CLP (IMICHT79)** – developed by Montana State University and carried by WestBred /Bayer Crop Science, WB9879CLP is a hard red spring wheat with the solid stem characteristic that reduces impact from wheat stem sawfly. WB9879CLP is a two-gene Clearfield wheat with tolerance to imazamox herbicide Beyond®. Additional use of spring Clearfield tolerant wheat includes planting following beans where imazamox may have a residual presence in the soil, or to reduce wheat red volunteer in white spring wheat production. In 3-year summaries under dryland conditions, yields were a little below average and comparable to Choteau with similar test weight and protein, and 1 inch shorter in plant height. WB9879CLP headed 3 days later than Choteau (Table 26).

## **WINTER WHEAT – Soft White Winter**

**AP Exceed (11PN039#20)** – is a soft white winter wheat primarily adapted to intermediate to high rainfall and irrigated production in Eastern Washington and Eastern Oregon, and has done very well in southern Idaho, yielding 155 bu/A over the previous three years (Table 14), and 111% of irrigated trial averages in 2021 and 109% of trial average in 2023 (Table 23). AP Exceed yields in 2023 were greater than LCS Hulk and SY Ovation, was earlier and shorter than the average of the trials (Table 17) with good straw strength and had good test weight in a very bad year for test weight in 2023. AP Exceed is tolerant to stripe rust, susceptible to soil borne mosaic virus, and susceptible to dwarf bunt.

**AP Iliad (11PN044#84)** – soft white winter released in 2020 by Agripro Syngenta adapted to intermediate to high-moisture rainfall and irrigated conditions with good straw strength. Over three-year averages (Table 14), AP Iliad yields were at trial average, while at the 2020 Kimberly site yield was 180 bu/A and in 2021 at the irrigated Ririe site yield was 114% of average. In 2023, AP Iliad averaged 88% of trial averages for yield (Table 23 and Chart 3). At 1 in lower than average for height and 1-2d earlier flowering, AP Iliad also had higher test weight than the 3-year average. AP Iliad has resistance to stripe rust, strawbreaker foot rot, physiological leaf spot (PLS), soil-borne mosaic virus (SBMV), and is susceptible to dwarf bunt.

**Appleby CL+ (ORI2161250CL+)** – Appleby CL+ is a soft white winter wheat released in the fall of 2019 as 'Appleby CL+' after Dr. Arnold Appleby, a long-time professor of Weed Science at OSU. Clearfield wheats have resistance to imazamox herbicides such as to Beyond®

herbicide for hard-to-control grassy weeds. Appleby CL+ was placed in the dryland trials in 2022, with yields at 96% of average, and suffered stand loss due to severe winter conditions in 2023. Appleby CL+ has an 1d earlier heading date than UI-Magic, good resistance to stripe rust, and good yield potential in the low to intermediate rainfall conditions in the PNW with acceptable end-use quality. Appleby CL+ is one of the earliest maturing Clearfield varieties and is susceptible to dwarf bunt.

**Devote (WA8271)** – a soft white winter wheat released in 2019 by the Washington State Ag Experiment Station and USDA-ARS, intended for rainfed production in areas of <12 inches of precipitation. In Washington, yields exceed Otto and has stripe rust resistance, good eyespot resistance, Fusarium crown rot resistance (FCR or dry land foot rot) resistance and has cold and snow mold tolerance. In Idaho, Devote performs agronomically similar to UI Sparrow with better test weight (Table 15). Devote and has excellent emergence when deep planted, yielding 105% of average in 2022 and 112% of trial average in 2020. Heading date was 1d later than Eltan and Otto and the same as UI Sparrow. Test weight was very good and plant height was about 1-2 in less than Eltan. Devote has good FCR, strawbreaker (eyespot), snow mold and stripe rust resistance. Devote is moderately resistant to dwarf bunt (similar to Eltan) but still requires difenoconazole seed treatment to prevent infection and quality issues. End use quality is better than Eltan.

**Eltan (WA7163)** – soft white winter wheat released in 1990 by the Washington AES. Eltan has wide adaptability in the dry land production areas with good snow mold tolerance. Yields are still consistently good to average in dry land trials (Table 15).

Eltan will lodge under irrigation and is one of the latest varieties for heading date but is still a good choice for dry land production areas. Under heavy stripe rust pressure, Eltan was susceptible to stripe rust, and is moderately resistant to moderately susceptible to dwarf bunt, so difenoconazole seed treatment is recommended. Over the previous three years of dryland production testing, Eltan produced 4-5 bu/A better when 20 lbs/A P<sub>2</sub>O<sub>5</sub> 11-52-0 was included in-furrow.

**LCS Blackjack (LWW15-71945)** – Blackjack is a 2019 release from the Limagrain Cereal Seeds program; it is an awnless soft white winter derived from a Bobtail/Rosalyn cross with good yields in the 3-year averages (Table 14), and agronomically similar to SY Ovation. In 2023 yields were at of trial averages (Table 23), reduced over previous years due to winter kill and stand reduction in Ririe (Table 20). Blackjack was 2-3 inches shorter than WB1783 with similar heading date but with much lower test weight. Straw strength was very good, and LCS Blackjack is resistant to stripe rust, has good stress resistance and good disease resistance to stem based diseases. LCS Blackjack is susceptible to dwarf bunt.

**LCS Hulk (LWW14-73163)** – a soft white winter with released in 2018 by Limagrain Cereal Seeds for its wide adaptation in the PNW and high yield potential. Three-year average yields were greater than WB1783 but with lower test weight (Table 14). In 2023, average yield of LCS Hulk was 114% of trial average (Table 23). Under dry land conditions, LCS Hulk yielded slightly higher than Eltan and UI Sparrow (Table 21). LCS Hulk has high adaptability, excellent standing power, good resistance to stem based diseases. Height is average under dry land conditions, about 1 inch taller than

average under irrigation, and heading date is at or 1d later than trial average. LCS Hulk has good test weight and low to average protein. LCS Hulk is susceptible to dwarf bunt and resistant to stripe rust.

**Norwest Duet (LOR-092)** – Norwest Duet was released in 2015 by Oregon State University jointly with Limagrain Cereal Seeds. Norwest Duet is a very tall soft white winter wheat that in the irrigated locations may lodge and is recommended for dryland production areas. Norwest Duet performed at trial average for yield and lower than average for test weight over the previous 3 years (Table 15). Heading date was at average in dry land trials, 2-4 days earlier than Otto and Eltan for heading, and grain protein was less than average and less than Otto. Norwest Duet is moderately susceptible to dwarf bunt and is resistant to stripe rust. Norwest Duet has desirable end use quality, better than Norwest Tandem.

**Norwest Tandem (LOR-334)** – a soft white winter wheat that was released in 2016 by Oregon State University jointly with Limagrain Cereal Seeds, LLC. Norwest Tandem yields were below average in 2021-2023 combined irrigated data, less than SY Assure (Table 14). Tandem has earlier to mid-maturity, is short with stiff straw, and is best under irrigation, although Norwest Tandem did very well in Soda Springs in 2023 (Table 22). Tandem had low test weight, acceptable end use quality, and is very susceptible to dwarf bunt, with good resistance to stripe rust.

**Otto (WA008092)** – a dry land (<12” rainfall production zone) soft white winter released September 2011 by Washington AES, Otto is similar agronomically to Eltan and both are 2-5 days later in heading than trial average (Table 15). Otto has similar yield potential to UI Sparrow, often better

than Eltan, with test weight similar to Eltan. Otto has good emergence from deep plantings in the dry land areas with good cold tolerance and straw strength. Otto has resistance to eyespot foot rot and will have similar snow mold tolerance as Eltan, better stripe rust resistance and also is moderately resistant to dwarf bunt. End use quality was better than Eltan.

**Piranha CL+ (WA8305CL+)** – Piranha CL+ is a Clearfield soft white winter wheat released in 2020 by WSU AES and the USDA-ARS in Pullman. Clearfield wheats have 2-gene resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds in winter wheat production. In three years of testing, Piranha CL+ has done very well under irrigated and dryland conditions, with yields at 106% of average in 2022, and 114% of average in 2023, performing very well in Soda Springs (Table 23). Irrigated yields were above average (Table 14), but test weights were low due to preharvest sprouting and late-season rain. Piranha CL+ emerges well after deep-planting in the dryland production areas and while it yielded very well, Piranha CL+ may lodge under irrigated higher production areas. Piranha CL+ is susceptible to dwarf bunt.

**Sockeye CL+ (WA8306CL+)** – another 2020 release from the Washington State University, Sockeye CL+ is a soft white winter wheat with 2-gene resistance to imazamox herbicide. Sockeye CL+ also has very high yield potential and broad adaptability across production regions, yielding just below AP Exceed in 3-year irrigated testing (Table 14). It is recommended for production in the intermediate and high rainfall areas of the PNW and has performed similarly to WB1783 and greater than SY Ovation for yield in these trials. Sockeye CL+ has a

taller plant height and may lodge under irrigation. Yields were greater than UI Sparrow and Otto under dryland conditions, had average test weight and had a heading date 1-5 days earlier than Eltan and Otto. Sockeye CL+ is moderately susceptible to dwarf bunt.

**Stephens (OR65-116)** – a 1977 soft white winter release from Oregon AES, Stephens is kept for long-term check in Idaho EVTs. Yield and test weight under irrigation are below average (Table 14, and Table 15), yielding 92% of trial average in 2023 (Table 23, Chart 3). Stephens heading date and grain protein are at average. End use quality is poor. Stephens is moderately susceptible to moderately resistant dwarf bunt, and does not have good resistance to BYDV, snow mold or stripe rust.

**Stingray CL+ (WA8275CL+)** – Officially released in 2019 through WSU as Stingray CL+, WA8275 CL+ was the top yielding soft white winter 2-gene Clearfield line in Washington, Northern Idaho and Oregon. Stingray CL+ is broadly adapted and has very good stripe rust resistance, eyespot foot rot (strawbreaker) resistance, and very good end use quality. Stingray CL+ has higher falling number values and good test weight. Recent trial in southeast Idaho have had late season rain, reducing test weight of harvested grain due to pre-harvest sprout damage. In 3-year summaries of irrigated locations, Stingray CL+ yields were below average, greater than UI Sparrow and WB 456, and in 2023 yields were 96% of irrigated averages (Table 23) due to lower plant stands after a cold winter. Stingray CL+ had 2d later than average heading dates, lower test weight and is at average height (Table 14). Stingray CL+ is susceptible to dwarf bunt.

**SY Assure (SY96-2)** – a soft white winter wheat released in 2016 by Syngenta Cereals, yield in 2021-2023 irrigated trials was 9 bu/A less than SY Ovation (Table 14) with low test weight (due to preharvest sprout after late season rain). SY Assure is broadly adapted with earlier heading than the trial average by 3-5 days and is 3 inches shorter than average and well suited for irrigated production under wheel lines. In 2022, SY Assure yields were 106% of irrigated averages while in 2023 was 84% overall (Table 23), after having low stands in Ririe from winter kill. SY Assure is moderately resistant to moderately susceptible to dwarf bunt, and resistant to stripe rust.

**SY Ovation (03PN108#21)** – a soft white winter wheat released by Syngenta Cereals in 2011 for higher rainfall and irrigated production. SY Ovation has had excellent yields over the past seven years generally with good test weight. However, the recent results reflect low test weight due to preharvest sprout after late season rain. 2023 irrigated and dryland yields were above average at 109% of trial average (Table 23), doing very well in Kimberly (Table 18) at 167 bu/A, 31 bu/A above average. Heading date, height, lodging and grain protein were above average with lower than average test weight (see Table 14). SY Ovation is resistant to soil-borne mosaic virus, moderately susceptible to current races of stripe rust and very susceptible to dwarf bunt. SY Ovation has good end use quality and good threshability.

**TMC M-Pire (TMC2021SWW)** – a soft white winter wheat released through The McGregor Company, M-Pire performance in Washington in 2022 showed a high yielding wheat with excellent test weight, stripe rust resistance and lodging resistance in the intermediate to high rainfall zones. It is shorter than average and early to medium

maturity. In the first year of testing in the UI EVT, TMC M-Pire performance was agronomically in the middle range for spring stand, test weight and yield, but was 3 inches shorter than trial average, similar to WB1529 in plant height. TMC M-Pire was at 99% of trial averages for yield (Table 23), doing well at all locations (106% of trial averages) except Ririe, where winter kill reduced plant stands of many winter wheat varieties (Table 20).

**UI Magic CL+ (IDN 09-DH11)** – UI Magic CL+ is a Clearfield soft white winter wheat with two-genes for resistance to imazamox herbicide. Clearfield wheats have resistance to imazamox herbicides such as to Beyond® herbicide for hard-to-control grassy weeds. UI Magic CL+ was released in 2015 as a joint release from the Idaho AES and LCS seeds. Yields in 2021-2023 were 7 bu/A less than the trial average (Table 14) and similar to Stephens but 2 inches shorter with similar test weight. Heading date is 1d earlier than trial averages. UI Magic CL+ is widely adapted, performing similar to WB 456 under dryland conditions, is susceptible to dwarf bunt and very susceptible to stripe rust.

**UI Sparrow (IDO1108)** – a 2016 release from the University of Idaho, UI Sparrow is a soft white winter wheat with high yield potential in irrigated and dry land production. While adapted to both, UI Sparrow has a higher tendency to lodge under irrigated production. Three-year irrigated yield was below average and similar to WB 456 Stephens (Table 14). UI Sparrow has low test weight (54.8 lbs/bu) and is 3-4 days later in heading date than average under irrigation. Sprouting damage contributed to low test weight in the previous 2-3 years due late season rain. Under dry land conditions, UI Sparrow was at trial average over the past 3 years (Table

15), similar to Norwest Duet and Devote. UI Sparrow is very resistant to dwarf bunt, which is a huge benefit under organic production systems. It was susceptible to current 2019 races of stripe rust, which was a low disease pressure year.

**VI Presto CL+ (UIL17-6451CL+)** - released through the UI/LCS joint venture in 2020, VI Presto CL+ is a soft white winter Clearfield line tested under irrigated and dry land conditions, targeted for low- to intermediate rainfall areas. VI Presto CL+ has better emergence properties than Norwest Duet and yielded below trial average for irrigated trials (Table 14), similar to UI Sparrow, with much higher test weight, 1d earlier heading date and 2 inches shorter for plant height. VI Presto CL+ has resistance to stripe rust, tolerance to *Cephalosporium* stripe, susceptibility to dwarf bunt and is photoperiod insensitive.

**VI Shock (UIL15-72223DH)** – a soft white winter wheat released for irrigation through the UI/LCS joint venture in 3-year irrigated trials, VI Shock yields were similar to SY Assure (Table 14), slightly below trial averages. In 2023, yield was at 102% of trial average (Table 23), doing well in Aberdeen, but suffering winter damage and reduced spring stands in Ririe (Table 20). Test weight is lower than average at 55.0 lbs/bu compared with 56.5 lbs/bu. Sprouting damage contributed to low test weight in the previous 2-3 years due late season rain. VI Shock has medium to late maturity, low protein and plant height is 1 inch greater than average (Table 14). VI Shock is susceptible to dwarf bunt.

**VI Voodoo CL+ (UIL17-6268CL+)** – A soft white winter released through the UI/LCS joint venture in 2020, VI Voodoo CL+ is a two-gene Clearfield line with yield and agronomic traits similar to SY Ovation

over the irrigated three-year averages (Table 14). Yield performance in 2023 was at 74% of trial average doing very poorly in Soda Springs. VI Voodoo CL+ is intended as a replacement for UI Magic CL+, with greater yield potential and resistance to stripe rust. Test weight was below trial average (Table 14), and heading date was later than average, usually a function of low plant stand. VI Voodoo CL+ susceptible to dwarf bunt.

**WB 456 (BU6W99-456)** – a soft white winter wheat from WestBred (a unit of Bayer Crop Science). WB 456 was released as an improvement over WB 470 and as a replacement for WB 528. WB 456 yielded similar to Stephens in the past three years (Table 14) and generally has excellent test weight. Sprouting damage contributed to low test weight in the previous 2-3 years due late season rain. 2023 yields were below average, about 91% of trial entries (Table 23). WB 456 is similar in height to Stephens (at trial average) with improved lodging resistance. WB 456 has an early heading date, 3-5 days earlier than average, and is moderately susceptible to stripe rust. WB 456 is susceptible to dwarf bunt.

**WB1376CLP (WB-1038CL)** – soft white winter wheat released by WestBred (a unit of Bayer Crop Science) in 2015. WB1376CLP is imi-tolerant, containing two genes for tolerance to BASF's grass herbicide Beyond®. Irrigated yields in 2023 were below average and including dryland yields were 85% of average (Table 23). Spring stand was reduced in 2023 due to winter kill in the upper elevation trials. Dry land yields were below the trial averages, similar to Stephens (Table 15). Height is average and 1-2 inches taller than WB 456. WB1376CLP is susceptible to dwarf bunt, and moderately resistant to moderately susceptible to stripe rust.

**WB1529 (BZ6W07-436)** – soft white winter wheat released in 2014 by WestBred (a unit of Bayer Crop Science). Yields of WB1529 under irrigation are similar to SY Assure over three years 2021-2023 (Table 14) and suffered low test weight due to multiple seasons with late season rain and sprout damage. Spring stands were significantly reduced in irrigated trials at Ririe due to winter kill. WB1529 is 2-4 inches shorter than average, with grain protein was at nursery averages. WB1529 is 1-2 days earlier in heading date and 3 inches shorter than WB1783. WB1529 has good milling and baking quality. WB1529 is resistant to current races of stripe rust and resistant to dwarf bunt.

**WB1621 (XE1304)** – a recently released awnless soft white winter from Westbred/Bayer Crop Sciences, WB1621 is a medium-late maturity variety with good winter hardiness and high test weight for irrigated production. Irrigated yield in 2023 was at 110% of trial averages (Table 23), greater than WB1783 by 4 bu/A and greater than WB1529 by 6 bu/A. WB1621 is shorter and earlier than WB1783, with similar grain protein. WB1621 has moderate resistance to stripe rust and is susceptible to dwarf bunt. WB1621 can be used for both grain and forage production due to the awnless heads.

**WB1783 (BZ6W09-471)** – a very high yielding soft white winter wheat released in 2016 by WestBred (a unit of Bayer Crop Science). Irrigated yield of WB1783 greater than SY Ovation and equal to LCS Hulk (Table 14), with very good test weight and good straw strength. Irrigated yield in 2022 was the highest in the trials (Table 17 and Chart 3), higher than LCS Hulk and SY Ovation. In 2023, irrigated yields were at 105% of trial averages. Dry land yields are also usually excellent but were at average in the previous three years of testing (Table

15). WB1783 is very resistant to stripe rust and very susceptible to dwarf bunt. WB1783 tends to be a late variety and should not be planted late in the fall.

## **WINTER WHEAT– Hard Red and White**

### **Hard White Winter Wheat**

**Golden Spike (UT1944-158)** – a 1999 release from Utah AES for dry land production, Golden Spike is a hard white winter wheat with a partial waxy endosperm. Golden Spike will lodge under irrigation. Under dry land conditions, Golden Spike's yield is below average, with 2022 yield at 88% of average (Table 5), but in 2023 Golden Spike yielded well in Soda Springs (Table 12). Yield, spring stand and grain protein were all less than the dryland production averages over the previous three years (Table 5). Plant height was 9 inches less than Juniper. Golden Spike is very resistant to dwarf bunt but is susceptible to stripe rust.

**Irv (OR2110679)** – a hard white winter wheat released from Oregon State University in 2018 for moderate rainfall production conditions, Irv had low yield average under dry land conditions (Table 5). In 2022, Irv yields were 91% of trial averages, similar to Millie and Golden Spike. In Soda Springs, spring stands of Irv averaged 15%. Irv is short with plant height 3 inches below trial average, and was below average for test weight. Irv has good end use quality, higher than average protein and is moderately resistant to stripe rust. Irv is susceptible to dwarf bunt.

**Millie (OR2130118H) (W)** – a hard white winter released the fall of 2020, named 'Millie' after Millie Rouch, wife of Chris Rouch, a dry land wheat farm family in

eastern Oregon who have been long time supporters of the OSU wheat breeding program. Millie yields were below average under irrigation and dryland trials in southern Idaho with 2.5 lb/bu higher test weight and yield similar to UI Bronze Jade. Millie has good stripe rust resistance, excellent yield potential across low rainfall zones. Millie is 1-3 inches shorter than average, with acceptable to good quality which depends on hitting protein targets.

**UI Bronze Jade (W) (IDO1706)** – this hard white winter wheat released by IAES in 2019 has been in the trials for 6 years, and has demonstrated lower than average yield in the recent 3 year summaries, has very low test weight, and overall poor quality. UI Bronze Jade should be grown only with a specific contract market in mind. This dry land variety will lodge under irrigation and is 2-3 inches taller than average in irrigated trials. Irrigated yields for the previous three years was below average, with test weight at 56.5 lbs/bu (compared to trial average of 58.4 lbs/bu). UI Bronze Jade was susceptible to stripe rust in 2019 and is susceptible to dwarf bunt.

**UI Silver (IDO658B)** – a hard white winter wheat released in 2011 by the University of Idaho AES. UI Silver yields were below trial averages under dry land conditions with good test weight (Table 5). UI Silver has good end use quality for both bread and Asian noodles. UI Silver has resistance to stripe rust (high temperature adult plant or HTAP), dwarf bunt, and carries the SrTmp gene for resistance to stem rust. It is susceptible to black chaff and lodging, which can be a problem under irrigation. Like Golden Spike, UI Silver is a partial waxy wheat. UI Silver is very resistant to dwarf bunt and moderately resistant to stripe rust.

## **Hard Red Winter Wheat**

**Balance (WA8248)** – a hard red winter wheat released in 2020 by Nutrien Ag, tested in the trials from 2021. Average irrigated yield was similar to FourOsix over the past three years (Table 4) and 3 bu/A less than Yellowstone, but in 2023 Balance yields were 90% of yield average (Table 13). Balance had very high grain protein (13.6%), average test weight, and was average for plant height, similar to Keldin. Balance is susceptible to dwarf bunt.

**Flathead (MT1564)** – A hard red winter wheat released through Montana State University (MAES) in 2019, Flathead has a Yellowstone background with enhanced stripe rust resistance (two genes for resistance), with shorter stature and early maturity. 2023 yield of Flathead was 112% of irrigated trial average (Table 13) doing very well in Ririe. In the 3-year summaries, Flathead yields were 3 bu/A greater than Yellowstone with higher test weight (Table 4). Test weight and grain protein of Flathead is good to excellent. Flathead had higher lodging and lower protein than Yellowstone.

**FourOsix (MT1462)** – a hard red winter released in 2018 by Montana State University as a replacement to Yellowstone, well-known for its high yield, with improved milling and baking qualities over Yellowstone. FourOsix has shown high loaf volume, water absorption and mixing characteristics. In the three-year trial averages, FourOsix had 3 bu/A less yield and slightly lower grain protein than Yellowstone, with the similar test weight and was 4 in shorter. FourOsix has better resistance to stripe rust than Yellowstone. In the 2023 Soda Springs trial, winter stands of FourOsix and the other Montana lines were much greater than average. FourOsix is very susceptible to dwarf bunt.

**Juniper (IDO 575)** – hard red winter wheat released in 2005 by the Idaho AES for dry land production areas. Juniper has moderate yield potential under dry land production, yielding 2 bu/A above the average for the trials (Table 5 and 13). Juniper is extremely tall and will lodge under irrigation. Juniper has good test weight and high protein, yielding similar to Yellowstone and Keldin, is very resistant to dwarf bunt and moderately resistant to stripe rust.

**Kairos (T44)** – a hard red winter wheat from Highland Specialty Grains in Washington having better resistance to stripe rust than KCS Jet and Keldin. Kairos is 6 inches shorter than the trial averages in the 3-yr summaries (Table 4), and 3d earlier in heading. Yield averages over the previous three years have been 10 bu/A below average, lower than the hard white Millie. Kairos yields in 2023 were 96% of irrigated average, performing well (108%) in the irrigated trial near Ririe.

**Keldin (ACS55017)** – a hard red winter wheat distributed by WestBred (a unit of Bayer Crop Science) for irrigated production, Keldin has consistently been a high yielding hard red winter wheat with high grain protein in these trials (Table 4). 2022 yields were at 166 bu/A, the highest in the irrigated trials, yielding 111% of trial average yield. In 2023, Keldin yields were 109% of irrigated averages (Table 13). Keldin is a little shorter than average for height, has very high test weight, and is at average for grain protein. Keldin is susceptible to dwarf bunt and in 2016 and 2018 was moderately susceptible to current races of stripe rust.

**Keldin + 11-52-0** – In-furrow fertilizer was added to one variety in the hard winter and soft winter group to test the effect of starter fertilizer on yield. Monoammonium

phosphate or 11-52-0 at 20 lbs phosphate as P<sub>2</sub>O<sub>5</sub> per acre was included in-furrow. In Table 4 (3-year irrigated averages), Keldin and Keldin +11-52-0 were within 5 bushels of each other (LSD or least significant difference = 6.1 bu/A), indicating no effect of starter fertilizer on yield, stand or other agronomic traits. Under dry land conditions, Keldin + 11-52-0 was 3 bu/A greater than Keldin, with the LSD of 3 bu/A, which is not a statistically significant difference between the two for yield. In 2020, dry land yield was improved by 6 bu/A with the addition of starter fertilizer (11-52-0), resulting in yield at 108% of trial average, as compared to Keldin without starter which yielded 98% of trial average.

**LCS Jet (NSA 7208)** – a hard red winter with released in 2015 by Limagrain Cereal Seeds. LCS Jet has good yield potential and average grain protein (Table 4) and has been a high yielding hard red winter for the previous eight years of irrigated testing. In 2022, LCS Jet yielded 112% of irrigated mean, while in 2023, yields were 99% of irrigated averages (Table 13 and Chart 2), doing particularly well in Ririe. Test weight and lodging have been below average, and LCS Jet has been 2-3 inches shorter than average. LCS Jet is very susceptible to dwarf bunt and showed sensitivity to winter kill in 2023 (Table 12). In 2019, LCS Jet showed an increase stripe rust susceptibility with a susceptible infection type. LCS Jet has good end use quality.

**LCS Rocket (NSA10-2196)** – is a hard red winter wheat released from Limagrain Cereal Seeds in 2018, demonstrating high yield potential in Northern Idaho and the Palouse area in high rainfall zones. Three-year irrigated average yield was greater than LCS Jet and Yellowstone, with lower test weight and lower grain protein. Yields in 2023 were 97 percent of trial irrigated

averages (Table 13), while in 2022 were 105% of trial average, and in 2021 yields were 107% (Table 14). Heading date is similar to Keldin, and LCS Rocket is shorter than Keldin (3 inches) and Yellowstone (7 inches). LCS Rocket has good resistance to stripe rust and is susceptible to dwarf bunt.

**Milestone (ACS14132-412)** – a new hard red winter wheat released through Nutrien Ag Solutions in Bozeman, MT. Milestone was first tested in irrigated trials in 2021 yielding 104% over all irrigated trials and 108% of trial averages in 2022. In 2023, irrigated yields were 103% of average, 6 bu/A greater than Yellowstone, with lower grain protein and test weight. Milestone headed 2 days earlier than Yellowstone and was 5 inches shorter. Milestone is susceptible to dwarf bunt.

**MT Warcat (MTS18149)** – released in 2022 by Montana State University breeding program, MT Warcat is a high yielding hard red winter wheat with solid-stem for tolerance to wheat stem sawfly. MT Warcat is a rainfed and dryland variety that has improved winter hardiness and aluminum tolerance for regions with highly acidic soils. In the 2023 Soda Springs trial where winter kill was an issue, winter stands of MT Warcat and the other Montana lines were much greater than average. In end-use quality, it is a low PPO (polyphenol oxidase) grain, with high falling number, high water absorption and strong mix times.

**NuMont (MT1491)** – NuMont hard red winter was recently released by the MSU breeding program for the dryland production areas in the intermountain West. In the 2023 Soda Springs trial where winter kill was an issue, winter stands of NuMont and the other Montana lines were much greater than average. In 2023, NuMont yields were higher than MT Warcat, and similar to

FourOsix, and were 119% of dryland trial averages, mostly due to winter hardiness characteristics. NuMont showed higher test weight than Yellowstone but lower grain protein, and Numont showed high susceptibility to dwarf bunt

**Promontory (UT1567-51)** – a hard red winter wheat released by Utah AES in 1990. Promontory is a dry land variety with excellent test weight. Yield under irrigation has been above average, but it will lodge and was not included in the irrigated trials. Promontory has short coleoptiles and may have trouble emerging when planted deep in dry soils. Over the past three years of testing (Table 5), Promontory yields were slightly below average. Promontory is resistant to dwarf bunt and moderately susceptible to stripe rust. Promontory is taller than average with good grain protein.

**Scorpio (WA8268)** – a broadly adapted hard red winter wheat released in 2019 by Agricultural Research Center of Washington State University, Scorpio is mid- to late-maturity with short stiff straw well adapted across the >15" rainfall zones of the Pacific Northwest. Scorpio has high yield potential similar to Yellowstone, however the most recent 3-year irrigated averages yields were affected by winter kill in higher elevation production trials. Average yield was 144 bu/A (Table 4) with no lodging, better than LCS Jet and Yellowstone. Test weight was less than average. Scorpio should be well-adapted to no-till situations with low pH soils and it has aluminum tolerance. In dry land trials, Scorpio yields were below average, similar to Promontory and UI Silver. Scorpio had moderately susceptible reaction to stripe rust in 2019, is susceptible to dwarf bunt and has tolerance to Hessian fly. Scorpio has good end use quality.

**Sequoia (WA8180)** – a dryland hard red winter wheat developed and released in 2015 by the Agricultural Research Center of Washington State University. Sequoia has very good (desirable) end use quality and emerges quickly in deep-planted situations. Sequoia yields under dryland conditions were less than Keldin and Juniper over the three previous years (Table 5) and were similar to Promontory and WB4510CLP. Test weight was less than average, grain protein averaged 12.3%, and heading was 3-4 days later than average. Sequoia has cold tolerance, adult plant resistance to stripe rust, and good straw strength. Sequoia is susceptible to dwarf bunt.

**UI SRG (IDO656B)** – a hard red winter wheat released in 2012 by the Idaho AES for the dry land conditions of southern Idaho and northern Utah. SRG will lodge under irrigation without the use of growth regulators. Yields have consistently been above dry land average, comparable to Yellowstone with slightly lower test weight, however in the past three years UI SRG showed some susceptibility to winter kill (Table 12). Yields were lower – at average for the past three years (Table 5). UI SRG is very resistant to dwarf bunt and resistant to stripe rust and is a good choice for dry land production in southern Idaho.

**Utah 100 (UT1650-150)** – a hard red winter wheat released in 1997 by the Utah AES. Utah 100 has consistently done well dry land conditions for yield, but recently due to poor winter hardiness (Table 12), yields have been low. As a dry land variety, Utah 100 will lodge under irrigated conditions. Utah 100 is very resistant to dwarf bunt and is susceptible to current races of stripe rust.

**WB4303** – released in 2022 by WestBred / Bayer Crop Sciences, WB4303 is an early to medium maturity hard red winter with high

yield potential, good lodging resistance and very good end-use quality. In 2023 trials, WB4303 yields were similar to Keldin and Milestone (Table 6), showing similar test weight, 4d earlier heading, and 9 inches shorter in plant height than Yellowstone with comparable grain protein. In comparison to WB4510CLP, WB4303 was 3 bu/A less in yield, 2 lbs/bu less in test weight, 3d earlier in heading but with higher grain protein. WB4303 did poorly under dryland conditions due to winter kill (Table 12).

**WB4401 (XC4109)** – a hard red winter wheat developed by WestBred (Bayer Crop Science) for the central and southern plains, WB4401 can be used for forage and grain yield. Tested only in Kimberly and Aberdeen, 2020 yields were 110% of trial average, and in 2021 irrigated yields were 108% of average. In 2023, yields were comparable to Yellowstone and WB4510CLP, 105% of irrigated trial averages, with very good test weight (Table 6). In 2023, WB4401 was a little taller than Keldin and similar in heading. WB4401 is moderately resistant to stripe rust and very susceptible to dwarf bunt. Under dryland conditions in 2023, winter kill reduced the spring stand and yield of WB4401.

**WB4510CLP (XD4201)** – a Clearfield Plus variety, WB4510CLP is a hard red winter wheat released by WestBred (a unit of Bayer Crop Science) in 2017. WB4510CLP is an imi-tolerant winter wheat containing two genes for tolerance to BASF's grass herbicide Beyond® (imazamox). In the 3-year irrigated averages, WB4510CLP yielded 153 bu/A, the same as LCS Rocket and 4 bu/A less than Keldin. WB4510CLP had excellent test weight, with similar grain protein and heading date to Keldin (Table 4). In 2022, yields were 104% of average, similar to LCS Rocket. In 2023, yields were

108% of irrigated averages, but winter kill reduced spring stand in Soda Springs (Table 12). WB4510CLP has good resistance to stripe rust, is medium maturity and taller than average.

**Yellowstone (MT00159)** – a hard red winter wheat with excellent yield potential in both irrigated (Table 4, Chart 2) and dry land conditions (Table 5) of southeast Idaho. Yellowstone was released by Montana State University and the AES in 2005 and has above average test weight and height, and high grain protein. Yield in 2022 was 102% of average, similar to WB4510CLP, and in 2023, yields were 113% average due to excellent winter hardiness demonstrated in the dryland trial at Soda Springs (Table 12). End use quality is average, with good loaf volume. Under very high production inputs, Yellowstone will lodge under irrigation. It is moderately resistant to dwarf bunt and susceptible to stripe rust.

**Table 3. Ten year averages of selected agronomic characteristics, 2013-2022 compared to 2023.**

NOTE: "Average" values are for years 2013 to 2022

**Winter Wheat (all market classes and locations)**

| YIELD       |            |            | TEST WEIGHT |            |             | PLANT HEIGHT |            |           | HEADING DATE |            |             |                | LODGING     |            |          |
|-------------|------------|------------|-------------|------------|-------------|--------------|------------|-----------|--------------|------------|-------------|----------------|-------------|------------|----------|
| Year        | # of Loc.  | bu/A       | Year        | # of Loc.  | lb/bu       | Year         | # of Loc.  | in.       | Year         | # of Loc.  | date        | Days fr. Jan.1 | Year        | # of Loc.  | %        |
| 2022        | 6          | 115        | 2017        | 6          | 60.8        | 2015         | 6          | 35        | 2022         | 6          | 6/13        | 165            | 2014        | 5          | 25       |
| <b>2023</b> | <b>3</b>   | <b>115</b> | 2018        | 6          | 60.3        | 2022         | 6          | 35        | <b>2023</b>  | <b>3</b>   | <b>6/12</b> | <b>164</b>     | 2016        | 6          | 11       |
| 2018        | 7          | 104        | 2020        | 7          | 60.2        | 2016         | 6          | 35        | 2019         | 6          | 6/12        | 164            | 2021        | 6          | 11       |
| 2015        | 6          | 103        | 2019        | 6          | 60.0        | <b>2023</b>  | <b>3</b>   | <b>34</b> | 2021         | 6          | 6/9         | 161            | 2013        | 5          | 8        |
| 2020        | 7          | 102        | 2016        | 6          | 59.4        | 2018         | 7          | 33        | 2020         | 7          | 6/8         | 160            | <b>Avg.</b> | <b>---</b> | <b>7</b> |
| 2014        | 4          | 101        | 2013        | 5          | 59.4        | 2019         | 6          | 33        | 2017         | 6          | 6/6         | 159            | 2022        | 6          | 5        |
| 2019        | 6          | 99         | <b>Avg.</b> | <b>---</b> | <b>58.6</b> | <b>Avg.</b>  | <b>---</b> | <b>32</b> | <b>Avg.</b>  | <b>---</b> | <b>6/6</b>  | <b>158</b>     | 2015        | 6          | 4        |
| <b>Avg.</b> | <b>---</b> | <b>98</b>  | 2015        | 6          | 58.1        | 2014         | 5          | 32        | 2013         | 5          | 6/5         | 158            | 2019        | 6          | 3        |
| 2021        | 6          | 95         | <b>2023</b> | <b>3</b>   | <b>57.6</b> | 2021         | 6          | 31        | 2014         | 5          | 6/4         | 157            | 2018        | 7          | 1        |
| 2016        | 6          | 94         | 2021        | 6          | 56.4        | 2013         | 5          | 31        | 2018         | 7          | 6/4         | 157            | 2017        | 6          | 0        |
| 2017        | 6          | 91         | 2014        | 4          | 56.1        | 2020         | 7          | 30        | 2016         | 6          | 5/31        | 152            | 2020        | 7          | 0.4      |
| 2013        | 5          | 79         | 2022        | 6          | 55.6        | 2017         | 6          | 29        | 2015         | 6          | 5/31        | 152            | <b>2023</b> | <b>3</b>   | <b>0</b> |

**Spring Wheat (all market classes and locations)**

| YIELD       |            |            | TEST WEIGHT |            |             | PLANT HEIGHT |            |           | HEADING DATE |            |             |                | LODGING     |            |          |
|-------------|------------|------------|-------------|------------|-------------|--------------|------------|-----------|--------------|------------|-------------|----------------|-------------|------------|----------|
| Year        | # of Loc.  | bu/A       | Year        | # of Loc.  | lb/bu       | Year         | # of Loc.  | in.       | Year         | # of Loc.  | date        | Days fr. Jan.1 | Year        | # of Loc.  | %        |
| 2014        | 5          | 107        | 2016        | 5          | 61.9        | 2020         | 5          | 34        | 2022         | 5          | 6/30        | 182            | 2014        | 4          | 16       |
| <b>2023</b> | <b>5</b>   | <b>107</b> | 2020        | 5          | 61.6        | <b>2023</b>  | <b>5</b>   | <b>34</b> | 2019         | 4          | 6/28        | 180            | 2022        | 5          | 5        |
| 2018        | 5          | 106        | 2017        | 5          | 61.6        | 2014         | 4          | 34        | <b>2023</b>  | <b>5</b>   | <b>6/27</b> | <b>179</b>     | 2021        | 5          | 5        |
| 2020        | 5          | 101        | 2013        | 5          | 61.4        | 2019         | 5          | 34        | 2020         | 5          | 6/25        | 177            | <b>Avg.</b> | <b>---</b> | <b>4</b> |
| 2019        | 5          | 100        | 2015        | 5          | 61.0        | 2022         | 5          | 33        | 2017         | 5          | 6/24        | 176            | 2019        | 5          | 4        |
| 2017        | 5          | 98         | 2018        | 5          | 61.0        | <b>Avg.</b>  | <b>---</b> | <b>31</b> | <b>Avg.</b>  | <b>---</b> | <b>6/23</b> | <b>175</b>     | <b>2023</b> | <b>5</b>   | <b>3</b> |
| <b>Avg.</b> | <b>---</b> | <b>97</b>  | 2019        | 5          | 60.8        | 2018         | 5          | 31        | 2013         | 5          | 6/23        | 175            | 2016        | 5          | 3        |
| 2015        | 5          | 97         | <b>Avg.</b> | <b>---</b> | <b>60.4</b> | 2021         | 5          | 31        | 2016         | 5          | 6/21        | 173            | 2015        | 5          | 2        |
| 2022        | 5          | 96         | 2022        | 5          | 60.0        | 2016         | 5          | 31        | 2018         | 5          | 6/20        | 172            | 2013        | 5          | 2        |
| 2016        | 5          | 91         | <b>2023</b> | <b>5</b>   | <b>59.2</b> | 2015         | 5          | 30        | 2021         | 5          | 6/20        | 172            | 2017        | 5          | 1        |
| 2021        | 5          | 89         | 2021        | 5          | 58.4        | 2017         | 5          | 28        | 2015         | 5          | 6/18        | 170            | 2018        | 5          | 0.3      |
| 2013        | 5          | 86         | 2014        | 5          | 56.5        | 2013         | 5          | 28        | 2014         | 5          | 6/18        | 170            | 2020        | 5          | 0.2      |

**Spring Barley (all market classes and locations)**

| YIELD       |            |            | TEST WEIGHT |            |             | PLANT HEIGHT |            |           | HEADING DATE |            |             |                | LODGING     |            |           |
|-------------|------------|------------|-------------|------------|-------------|--------------|------------|-----------|--------------|------------|-------------|----------------|-------------|------------|-----------|
| Year        | # of Loc.  | bu/A       | Year        | # of Loc.  | lb/bu       | Year         | # of Loc.  | in.       | Year         | # of Loc.  | date        | Days fr. Jan.1 | Year        | # of Loc.  | %         |
| 2016        | 5          | 129        | 2016        | 5          | 53.6        | 2014         | 4          | 36        | <b>2023</b>  | <b>5</b>   | <b>7/3</b>  | <b>185</b>     | 2014        | 4          | 56        |
| 2017        | 4          | 128        | 2020        | 5          | 53.5        | 2019         | 5          | 35        | 2019         | 4          | 6/30        | 182            | 2013        | 4          | 33        |
| 2014        | 4          | 127        | 2022        | 5          | 51.9        | <b>2023</b>  | <b>5</b>   | <b>34</b> | 2022         | 5          | 6/30        | 182            | 2019        | 5          | 31        |
| 2015        | 4          | 124        | 2013        | 4          | 51.6        | 2018         | 5          | 34        | 2020         | 5          | 6/28        | 180            | 2015        | 4          | 24        |
| 2013        | 4          | 122        | 2019        | 5          | 51.5        | 2020         | 5          | 33        | 2021         | 5          | 6/25        | 177            | <b>Avg.</b> | <b>---</b> | <b>21</b> |
| 2020        | 5          | 119        | 2017        | 4          | 51.4        | 2022         | 5          | 33        | <b>Avg.</b>  | <b>---</b> | <b>6/24</b> | <b>176</b>     | 2021        | 5          | 18        |
| <b>Avg.</b> | <b>---</b> | <b>119</b> | <b>Avg.</b> | <b>---</b> | <b>51.4</b> | <b>Avg.</b>  | <b>---</b> | <b>33</b> | 2017         | 4          | 6/24        | 176            | <b>2023</b> | <b>5</b>   | <b>18</b> |
| 2018        | 5          | 117        | 2018        | 5          | 51.4        | 2013         | 4          | 33        | 2014         | 4          | 6/24        | 176            | 2017        | 4          | 17        |
| <b>2023</b> | <b>5</b>   | <b>117</b> | 2015        | 4          | 50.6        | 2015         | 4          | 33        | 2018         | 5          | 6/24        | 176            | 2016        | 5          | 11        |
| 2019        | 5          | 111        | <b>2023</b> | <b>5</b>   | <b>50.6</b> | 2017         | 4          | 31        | 2013         | 4          | 6/21        | 173            | 2018        | 5          | 10        |
| 2022        | 5          | 107        | 2021        | 5          | 50.1        | 2021         | 5          | 31        | 2016         | 5          | 6/20        | 172            | 2022        | 5          | 5         |
| 2021        | 5          | 100        | 2014        | 4          | 48.8        | 2016         | 5          | 31        | 2015         | 4          | 6/16        | 168            | 2020        | 5          | 1         |

**Table 4. Hard Winter Wheat Irrigated Nurseries, 3-Year Averages (2021-2023; 11 site-years).**

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|
| <b>Keldin</b>                        | <b>157</b>       | 59.4                | 99                  | 6/7             | 38              | 10             | 12.4           |
| <b>WB4510CLP</b>                     | <b>153</b>       | 60.8                | 98                  | 6/7             | 39              | 6              | 12.4           |
| <b>LCS Rocket</b>                    | <b>153</b>       | 55.8                | 98                  | 6/6             | 35              | 5              | 11.9           |
| <b>MT1745</b>                        | <b>152</b>       | 59.3                | 98                  | 6/9             | 40              | 8              | 12.2           |
| <b>Milestone</b>                     | <b>152</b>       | 57.9                | 98                  | 6/7             | 37              | 10             | 12.3           |
| <b>Keldin ( plus 11-52-0)</b>        | <b>152</b>       | 59.2                | 99                  | 6/7             | 38              | 10             | 12.5           |
| <b>Flathead</b>                      | <b>151</b>       | 60.5                | 99                  | 6/4             | 40              | 12             | 12.2           |
| LCS Jet                              | 150              | 57.0                | 99                  | 6/8             | 35              | 1              | 12.4           |
| WB4401                               | 150              | 59.9                | 98                  | 6/4             | 39              | 10             | 12.0           |
| Yellowstone                          | 148              | 59.0                | 99                  | 6/9             | 42              | 9              | 12.6           |
| IDO2006 (W)                          | 146              | 57.8                | 99                  | 6/11            | 39              | 8              | 12.1           |
| FourOsix                             | 145              | 58.8                | 99                  | 6/8             | 38              | 7              | 12.3           |
| Balance                              | 145              | 58.5                | 96                  | 6/6             | 38              | 5              | 13.6           |
| UI Bronze Jade (W)                   | 143              | 56.5                | 99                  | 6/9             | 39              | 11             | 12.3           |
| Scorpio                              | 143              | 56.6                | 97                  | 6/9             | 35              | 0              | 12.4           |
| Millie (W)                           | 140              | 59.0                | 98                  | 6/9             | 37              | 5              | 12.9           |
| Kairos                               | 138              | 57.9                | 96                  | 6/4             | 32              | 3              | 12.0           |
| <b>Average</b>                       | <b>148</b>       | <b>58.4</b>         | <b>98</b>           | <b>6/7</b>      | <b>38</b>       | <b>7</b>       | <b>12.3</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>6</b>         | <b>1</b>            | <b>2</b>            | <b>1</b>        | <b>1</b>        | <b>4</b>       | <b>---</b>     |
| <b>CV (%)</b>                        | <b>9.8</b>       | <b>2.5</b>          | <b>4.9</b>          | <b>0.8</b>      | <b>4.5</b>      | <b>128.6</b>   | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety  
(W) = White

**Table 5. Hard Winter Wheat Dryland Nurseries 3-Year Averages (2021-2023; 5 site-years\*).**

| <b>Variety or Selection</b>          | <b>Yield<br/>(bu/A)**</b> | <b>Test Wt.<br/>(lb/bu)</b> | <b>Spring<br/>Stand (%)</b> | <b>Heading<br/>Date</b> | <b>Height<br/>(in.)</b> | <b>Protein<br/>(%)</b> |
|--------------------------------------|---------------------------|-----------------------------|-----------------------------|-------------------------|-------------------------|------------------------|
| <b>Keldin + 11-52-0</b>              | <b>37</b>                 | 56.3                        | 95                          | 6/15                    | 26                      | 12.3                   |
| <b>FourOsix</b>                      | <b>35</b>                 | 56.2                        | 95                          | 6/15                    | 24                      | 12.3                   |
| <b>MT1745</b>                        | <b>35</b>                 | 57.0                        | 96                          | 6/16                    | 24                      | 11.8                   |
| <b>Juniper</b>                       | <b>34</b>                 | 57.8                        | 97                          | 6/15                    | 33                      | 12.7                   |
| <b>Yellowstone</b>                   | <b>34</b>                 | 56.5                        | 96                          | 6/16                    | 26                      | 12.2                   |
| <b>Keldin</b>                        | <b>34</b>                 | 56.3                        | 95                          | 6/15                    | 26                      | 11.9                   |
| Flathead                             | 33                        | 56.4                        | 98                          | 6/12                    | 26                      | 12.2                   |
| IDO2006 (W)                          | 33                        | 55.8                        | 93                          | 6/18                    | 25                      | 12.9                   |
| LCS Jet                              | 33                        | 53.8                        | 94                          | 6/16                    | 21                      | 12.1                   |
| <b>UI SRG</b>                        | <b>33</b>                 | 56.3                        | 96                          | 6/15                    | 31                      | 12.9                   |
| <b>UI Silver (W)</b>                 | <b>31</b>                 | 57.4                        | 96                          | 6/16                    | 27                      | 12.4                   |
| <b>Promontory</b>                    | <b>31</b>                 | 57.3                        | 96                          | 6/15                    | 33                      | 12.7                   |
| <b>Sequoia</b>                       | <b>30</b>                 | 56.0                        | 93                          | 6/19                    | 29                      | 12.3                   |
| <b>WB4510CLP</b>                     | <b>30</b>                 | 58.1                        | 96                          | 6/14                    | 25                      | 12.7                   |
| <b>UI Bronze Jade (W)</b>            | <b>30</b>                 | 55.3                        | 95                          | 6/17                    | 26                      | 12.4                   |
| <b>Millie (W)</b>                    | <b>30</b>                 | 56.7                        | 88                          | 6/17                    | 25                      | 13.0                   |
| Irv (W)                              | 28                        | 55.1                        | 92                          | 6/17                    | 23                      | 13.1                   |
| Golden Spike (W)                     | 28                        | 56.7                        | 94                          | 6/17                    | 30                      | 12.1                   |
| Scorpio                              | 26                        | 54.6                        | 92                          | 6/18                    | 23                      | 12.4                   |
| Utah-100                             | 23                        | 57.5                        | 91                          | 6/15                    | 24                      | 14.2                   |
| <b>Average</b>                       | <b>31.7</b>               | <b>56.3</b>                 | <b>95</b>                   | <b>6/16</b>             | <b>26</b>               | <b>12.5</b>            |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>3</b>                  | <b>1</b>                    | <b>3</b>                    | <b>1</b>                | <b>1</b>                | <b>1</b>               |
| <b>CV (%)</b>                        | <b>14.7</b>               | <b>3.9</b>                  | <b>5.6</b>                  | <b>0.7</b>              | <b>6.1</b>              | <b>5.6</b>             |

\* Soda Springs data was excluded from this analysis due to poor stands and unreliable data.

\*\*Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

No lodging to report.

Table 6. Irrigated Hard Winter Wheat Data Combined from Aberdeen, Kimberly and Ririe 2023.

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|
| <b>MT1745</b>                        | <b>159</b>       | 59.9                | 94                  | 6/11            | 39              | 1              | 12.0           |
| <b>Yellowstone</b>                   | <b>158</b>       | 59.9                | 97                  | 6/10            | 41              | 3              | 11.8           |
| <b>WB4510CLP</b>                     | <b>156</b>       | 61.6                | 95                  | 6/9             | 38              | 0              | 11.6           |
| <b>WB4401</b>                        | <b>156</b>       | 62.0                | 96                  | 6/10            | 38              | 0              | 11.7           |
| <b>Flathead</b>                      | <b>155</b>       | 60.9                | 96                  | 6/6             | 38              | 0              | 11.8           |
| <b>LCS Rocket</b>                    | <b>155</b>       | 57.0                | 93                  | 6/8             | 33              | 0              | 11.5           |
| <b>Milestone</b>                     | <b>153</b>       | 58.8                | 97                  | 6/9             | 36              | 0              | 12.0           |
| <b>WB4303</b>                        | <b>153</b>       | 59.6                | 92                  | 6/6             | 32              | 0              | 12.0           |
| <b>IDO2006 (W)</b>                   | <b>151</b>       | 58.9                | 98                  | 6/12            | 37              | 0              | 11.3           |
| <b>Keldin</b>                        | <b>151</b>       | 60.2                | 96                  | 6/10            | 37              | 0              | 11.7           |
| <b>Scorpio</b>                       | <b>150</b>       | 58.4                | 94                  | 6/10            | 34              | 0              | 11.5           |
| <b>Keldin + 11-52-0</b>              | <b>150</b>       | 60.3                | 96                  | 6/10            | 37              | 0              | 11.8           |
| <b>WB4422</b>                        | <b>149</b>       | 61.3                | 97                  | 6/7             | 36              | 0              | 12.4           |
| <b>FourOsix</b>                      | <b>148</b>       | 59.7                | 96                  | 6/9             | 38              | 0              | 11.9           |
| <b>UI Bronze Jade 1 (W)</b>          | <b>145</b>       | 58.2                | 98                  | 6/11            | 39              | 3              | 11.6           |
| Balance                              | 145              | 59.5                | 89                  | 6/10            | 37              | 0              | 13.2           |
| Millie (W)                           | 144              | 59.4                | 95                  | 6/11            | 44              | 0              | 12.3           |
| OR2190064R                           | 141              | 58.0                | 83                  | 6/11            | 33              | 0              | 12.1           |
| Apst52                               | 139              | 58.3                | 97                  | 6/7             | 31              | 0              | 12.2           |
| HSG108                               | 139              | 56.2                | 95                  | 6/6             | 33              | 0              | 11.3           |
| LCS Jet                              | 138              | 57.6                | 97                  | 6/10            | 33              | 0              | 11.8           |
| Kairos                               | 119              | 58.3                | 88                  | 6/7             | 29              | 0              | 11.6           |
| <b>Average</b>                       | <b>148</b>       | <b>59.0</b>         | <b>94</b>           | <b>6/9</b>      | <b>36</b>       | <b>0.3</b>     | <b>11.8</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>14</b>        | <b>1</b>            | <b>10</b>           | <b>1</b>        | <b>2</b>        | <b>2</b>       | <b>1.0</b>     |
| <b>CV (%)</b>                        | <b>10.8</b>      | <b>1.8</b>          | <b>12.1</b>         | <b>0.8</b>      | <b>5.6</b>      | <b>981.8</b>   | <b>3.7</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety

(W) = White

Table 7. Dryland Hard Winter Wheat Data Combined from Soda Springs and Ririe, 2023.

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|
| <b>Yellowstone</b>                   | <b>44</b>        | 57.7                | 98                  | 6/29            | 27              | 14.7           |
| <b>FourOsix</b>                      | <b>42</b>        | 57.5                | 96                  | 6/27            | 25              | 14.5           |
| <b>IDO2006 (W)</b>                   | <b>42</b>        | 55.8                | 83                  | 7/1             | 25              | 14.2           |
| <b>MT1745</b>                        | <b>41</b>        | 59.2                | 93                  | 6/28            | 25              | 13.8           |
| <b>NuMont (MT1491) (W)</b>           | <b>41</b>        | 58.8                | 97                  | 6/29            | 27              | 13.8           |
| <b>MT 2019</b>                       | <b>40</b>        | 59.0                | 93                  | 6/29            | 23              | 14.3           |
| <b>UT11317-8</b>                     | <b>39</b>        | 55.0                | 90                  | 7/1             | 31              | 13.2           |
| <b>UT11223-10</b>                    | <b>39</b>        | 57.8                | 86                  | 6/30            | 28              | 12.7           |
| MT Warcat                            | 38               | 58.5                | 94                  | 6/30            | 22              | 14.4           |
| Sequoia                              | 38               | 56.2                | 90                  | 7/2             | 30              | 13.6           |
| Golden Spike (W)                     | 37               | 57.9                | 93                  | 6/29            | 30              | 12.9           |
| Keldin + 11-52-0                     | 36               | 58.1                | 88                  | 6/27            | 25              | 14.8           |
| Flathead                             | 36               | 59.7                | 96                  | 6/24            | 26              | 13.4           |
| Millie (W)                           | 36               | 56.6                | 86                  | 6/29            | 30              | 15.0           |
| WB4422                               | 35               | 60.1                | 94                  | 6/25            | 24              | 14.1           |
| Keldin                               | 35               | 58.3                | 94                  | 6/27            | 25              | 13.8           |
| Scorpio                              | 35               | 53.6                | 61                  | 6/28            | 22              | 13.8           |
| UI Silver (W)                        | 35               | 59.1                | 91                  | 6/28            | 28              | 13.0           |
| Promontory                           | 34               | 57.8                | 91                  | 6/28            | 34              | 14.5           |
| WB4510CLP                            | 34               | 60.7                | 88                  | 6/27            | 25              | 13.9           |
| LCS Jet                              | 33               | 54.4                | 66                  | 6/30            | 20              | 13.4           |
| UI SRG                               | 33               | 57.6                | 91                  | 6/29            | 31              | 14.6           |
| Juniper                              | 33               | 59.0                | 92                  | 6/25            | 28              | 13.4           |
| UI Bronze Jade 1 (W)                 | 33               | 56.3                | 95                  | 6/29            | 26              | 14.3           |
| Utah-100                             | 30               | 56.8                | 61                  | 6/28            | 23              | 14.8           |
| OR2190064R                           | 28               | 54.6                | 56                  | 6/23            | 21              | 14.5           |
| Irv (W)                              | 25               | 55.1                | 58                  | 6/25            | 23              | 14.3           |
| WB4303                               | 23               | 57.8                | 74                  | 6/25            | 22              | 14.3           |
| <b>Average</b>                       | <b>35</b>        | <b>57.4</b>         | <b>86</b>           | <b>6/28</b>     | <b>26</b>       | <b>13.9</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>5</b>         | <b>1</b>            | <b>11</b>           | <b>1</b>        | <b>1</b>        | <b>1</b>       |
| <b>CV (%)</b>                        | <b>14.7</b>      | <b>2.3</b>          | <b>12.7</b>         | <b>0.6</b>      | <b>4.8</b>      | <b>5.2</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety

(W) = White

No lodging to report

Table 8. Agronomic Data for Hard Winter Wheat at Kimberly, Irrigated, 2022-23.

| Variety or Selection      | Yield (bu/A) |            |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|---------------------------|--------------|------------|------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|
|                           | 2021         | 2022       | 2023*      |                     |                     |                 |                 |                |                |
| <b>Flathead</b>           | 118          | 171        | <b>177</b> | 62.2                | 100                 | 5/30            | 37              | 0              | 10.8           |
| <b>WB4510CLP</b>          | 136          | 185        | <b>173</b> | 63.2                | 100                 | 6/3             | 39              | 0              | 11.3           |
| <b>MT1745</b>             | 125          | 178        | <b>173</b> | 61.9                | 100                 | 6/6             | 40              | 4              | 11.2           |
| <b>Keldin</b>             | 145          | 201        | <b>170</b> | 61.6                | 99                  | 6/4             | 39              | 0              | 10.8           |
| <b>Yellowstone</b>        | 106          | 177        | <b>169</b> | 61.7                | 100                 | 6/5             | 42              | 8              | 10.4           |
| <b>Milestone</b>          | 130          | 158        | <b>168</b> | 59.9                | 100                 | 6/3             | 36              | 0              | 10.9           |
| <b>WB4303</b>             | ---          | ---        | <b>167</b> | 63.1                | 100                 | 6/3             | 39              | 0              | 10.9           |
| <b>WB4401</b>             | 134          | 176        | <b>167</b> | 60.9                | 100                 | 5/30            | 32              | 0              | 11.0           |
| <b>Keldin + 11-52-0</b>   | 125          | 179        | <b>163</b> | 61.7                | 100                 | 6/4             | 38              | 0              | 10.5           |
| <b>WB4422</b>             | ---          | ---        | <b>161</b> | 63.3                | 100                 | 5/31            | 38              | 0              | 10.5           |
| <b>UI Bronze Jade (W)</b> | 109          | 174        | <b>161</b> | 59.6                | 100                 | 6/7             | 41              | 8              | 10.5           |
| <b>Apst52</b>             | ---          | ---        | <b>160</b> | 59.8                | 100                 | 5/30            | 31              | 0              | 11.4           |
| IDO2006 (W)               | 116          | 180        | 158        | 61.0                | 100                 | 6/8             | 37              | 0              | 10.1           |
| FourOsix                  | 129          | 172        | 156        | 60.0                | 100                 | 6/4             | 38              | 0              | 11.2           |
| LCS Rocket                | 137          | 177        | 152        | 61.6                | 99                  | 6/1             | 31              | 0              | 10.8           |
| Scorpio                   | 123          | 172        | 150        | 59.0                | 98                  | 6/7             | 34              | 0              | 10.3           |
| LCS Jet                   | 154          | 182        | 149        | 59.9                | 100                 | 6/3             | 33              | 0              | 10.2           |
| Balance                   | 132          | 161        | 146        | 61.9                | 99                  | 6/4             | 39              | 0              | 11.3           |
| OR2190064R                | ---          | ---        | 145        | 60.3                | 98                  | 6/7             | 34              | 0              | 10.6           |
| Millie (W)                | 129          | 160        | 140        | 61.8                | 100                 | 6/7             | 45              | 0              | 11.2           |
| Kairos                    | 152          | 155        | 135        | 59.8                | 98                  | 5/30            | 29              | 0              | 10.1           |
| HSG108                    | ---          | ---        | 133        | 57.9                | 93                  | 6/3             | 34              | 0              | 10.2           |
| <b>Average</b>            | <b>122</b>   | <b>169</b> | <b>158</b> | <b>60.3</b>         | <b>99</b>           | <b>6/6</b>      | <b>36</b>       | <b>1</b>       | <b>10.7</b>    |
| <b>LSD (0.05)</b>         | <b>21</b>    | <b>18</b>  | <b>17</b>  | <b>0.3</b>          | <b>3</b>            | <b>1</b>        | <b>2</b>        | <b>7</b>       | <b>---</b>     |
| <b>CV (%)</b>             | <b>12.3</b>  | <b>7.4</b> | <b>7.7</b> | <b>0.4</b>          | <b>2.1</b>          | <b>0.5</b>      | <b>3.9</b>      | <b>588.0</b>   | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

**Table 9. Agronomic Data for Hard Winter Wheat at Aberdeen, Irrigated, 2022-23.**

| Variety/Selection                    | Yield (bu/A) |             |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|-------------|------------|---------------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2021         | 2022        | 2023*      |                     |                     |                 |                 |                |
| <b>IDO2006 (W)</b>                   | 133          | 153         | <b>169</b> | 57.2                | 99                  | 6/9             | 38              | 12.1           |
| <b>WB4401</b>                        | 139          | 154         | <b>167</b> | 59.4                | 100                 | 6/9             | 36              | 12.5           |
| <b>FourOsix</b>                      | 130          | 153         | <b>164</b> | 57.7                | 100                 | 6/8             | 37              | 12.4           |
| <b>Flathead</b>                      | 146          | 144         | <b>162</b> | 58.8                | 95                  | 6/9             | 37              | 12.5           |
| <b>Scorpio</b>                       | ---          | 154         | <b>162</b> | 56.6                | 89                  | 6/9             | 35              | 12.8           |
| <b>WB4510CLP</b>                     | 143          | 167         | <b>161</b> | 58.4                | 98                  | 6/8             | 36              | 12.2           |
| <b>Yellowstone</b>                   | 140          | 155         | <b>161</b> | 57.6                | 96                  | 6/8             | 40              | 12.6           |
| <b>Keldin</b>                        | 144          | 141         | <b>160</b> | 56.8                | 94                  | 6/11            | 35              | 12.9           |
| <b>MT1745</b>                        | 138          | 167         | <b>160</b> | 57.9                | 100                 | 6/9             | 37              | 12.6           |
| <b>WB4303</b>                        | ---          | ---         | <b>159</b> | 57.6                | 79                  | 6/9             | 32              | 12.8           |
| <b>Milestone</b>                     | 136          | 177         | <b>159</b> | 57.2                | 96                  | 6/10            | 34              | 13.0           |
| <b>Keldin + 11-52-0</b>              | 134          | 151         | <b>158</b> | 57.0                | 84                  | 6/10            | 35              | 12.9           |
| <b>UI Bronze Jade (W)</b>            | 138          | 162         | <b>157</b> | 57.2                | 98                  | 6/10            | 37              | 12.3           |
| <b>LCS Rocket</b>                    | 137          | 160         | <b>156</b> | 55.9                | 100                 | 6/8             | 32              | 11.9           |
| <b>WB4422</b>                        | ---          | ---         | <b>156</b> | 58.3                | 100                 | 6/9             | 34              | 13.7           |
| LCS Jet                              | 130          | 165         | 150        | 55.8                | 100                 | 6/11            | 32              | 12.9           |
| HSG108                               | ---          | ---         | 149        | 54.5                | 89                  | 6/9             | 32              | 12.4           |
| OR2190064R                           | ---          | ---         | 149        | 56.4                | 75                  | 6/8             | 33              | 12.7           |
| Balance                              | 133          | 136         | 148        | 57.9                | 99                  | 6/10            | 36              | 13.8           |
| Apst52                               | ---          | ---         | 145        | 55.4                | 98                  | 6/10            | 29              | 12.8           |
| Millie (W)                           | ---          | 163         | 145        | 57.8                | 96                  | 6/8             | 44              | 13.0           |
| Kairos                               | 139          | 156         | 144        | 55.7                | 86                  | 6/9             | 28              | 12.6           |
| <b>Average</b>                       | <b>133</b>   | <b>155</b>  | <b>156</b> | <b>57.0</b>         | <b>93</b>           | <b>6/9</b>      | <b>35</b>       | <b>12.7</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>17</b>    | <b>23</b>   | <b>15</b>  | <b>2</b>            | <b>24</b>           | <b>3</b>        | <b>2</b>        | <b>---</b>     |
| <b>CV %</b>                          | <b>9.1</b>   | <b>10.5</b> | <b>6.9</b> | <b>2.4</b>          | <b>18.0</b>         | <b>1.3</b>      | <b>4.5</b>      | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

No lodging to report.

Table 10. Agronomic Data for Hard Winter Wheat at Ririe, Irrigated, 2022-23.

| Variety or Selection                 | Yield (bu/A) |            |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|------------|------------|---------------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2021         | 2022       | 2023*      |                     |                     |                 |                 |                |
| <b>Flathead</b>                      | 145          | 162        | <b>159</b> | 61.8                | 94                  | 6/12            | 40              | 12.1           |
| <b>Keldin</b>                        | 150          | 177        | <b>151</b> | 62.2                | 95                  | 6/16            | 38              | 11.3           |
| <b>Keldin + 11-52-0</b>              | 148          | 167        | <b>148</b> | 62.1                | 89                  | 6/17            | 38              | 12.0           |
| <b>WB4510CLP</b>                     | 142          | 156        | <b>147</b> | 63.3                | 88                  | 6/15            | 38              | 12.3           |
| <b>IDO2006 (W)</b>                   | 122          | 165        | <b>146</b> | 58.4                | 96                  | 6/19            | 37              | 11.6           |
| <b>Kairos</b>                        | 138          | 142        | <b>144</b> | 59.5                | 98                  | 6/13            | 31              | 12.0           |
| LCS Jet                              | 141          | 163        | 141        | 57.2                | 93                  | 6/17            | 34              | 12.4           |
| WB4303                               | ---          | ---        | 139        | 60.2                | 94                  | 6/12            | 32              | 12.4           |
| WB4401                               | 142          | 155        | 137        | 63.4                | 90                  | 6/17            | 39              | 12.2           |
| Milestone                            | 145          | 160        | 136        | 59.4                | 92                  | 6/15            | 37              | 12.0           |
| Yellowstone                          | 139          | 158        | 133        | 60.4                | 96                  | 6/19            | 42              | 11.5           |
| FourOsix                             | 132          | 149        | 132        | 59.8                | 90                  | 6/17            | 38              | 12.6           |
| WB4422                               | ---          | ---        | 130        | 62.2                | 91                  | 6/13            | 36              | 12.2           |
| Apst52                               | ---          | ---        | 129        | 59.2                | 91                  | 6/13            | 31              | 12.5           |
| UI Bronze Jade (W)                   | 136          | 137        | 129        | 58.0                | 98                  | 6/18            | 39              | 11.6           |
| LCS Rocket                           | 146          | 160        | 127        | 56.1                | 84                  | 6/17            | 34              | 12.3           |
| MT1745                               | 143          | 159        | 125        | 59.9                | 81                  | 6/19            | 40              | 12.1           |
| Scorpio                              | ---          | 142        | 120        | 58.6                | 83                  | 6/17            | 32              | 11.2           |
| OR2190064R                           | ---          | ---        | 112        | 57.2                | 80                  | 6/19            | 34              | 13.0           |
| Millie (W)                           | 129          | 148        | 111        | 58.6                | 85                  | 6/18            | 44              | 12.7           |
| Balance                              | 144          | 151        | 109        | 58.5                | 70                  | 6/16            | 36              | 14.4           |
| <b>Average</b>                       | <b>134</b>   | <b>150</b> | <b>133</b> | <b>59.8</b>         | <b>88</b>           | <b>6/16</b>     | <b>37</b>       | <b>12.2</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>9</b>     | <b>16</b>  | <b>17</b>  | <b>2</b>            | <b>17</b>           | <b>2</b>        | <b>2</b>        | ---            |
| <b>CV (%)</b>                        | <b>5.0</b>   | <b>7.7</b> | <b>9.1</b> | <b>2.1</b>          | <b>13.4</b>         | <b>0.6</b>      | <b>3.5</b>      | ---            |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

No lodging to report.

**Table 11. Agronomic Data for Hard Winter Wheat at Ririe, Dryland, 2022-23.**

| Variety or Selection                 | Yield (bu/A) |             |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|-------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2020         | 2021        | 2023*       |                     |                     |                 |                 |                |
| <b>WB4422</b>                        | ---          | ---         | <b>46</b>   | 60.1                | 100                 | 6/12            | 28              | 13.7           |
| <b>Keldin + 11-52-0</b>              | 41           | 18          | <b>46</b>   | 57.7                | 100                 | 6/14            | 29              | 14.6           |
| <b>FourOsix</b>                      | 38           | 17          | <b>45</b>   | 57.4                | 100                 | 6/15            | 27              | 15.0           |
| <b>Yellowstone</b>                   | 39           | 18          | <b>44</b>   | 56.9                | 100                 | 6/18            | 28              | 15.0           |
| <b>MT1745</b>                        | ---          | 20          | <b>44</b>   | 59.2                | 100                 | 6/16            | 27              | 13.5           |
| <b>MT1491 (W)</b>                    | ---          | ---         | <b>43</b>   | 58.4                | 98                  | 6/17            | 29              | 13.4           |
| <b>Keldin</b>                        | 33           | 17          | <b>42</b>   | 58.6                | 100                 | 6/13            | 28              | 12.6           |
| <b>WB4510CLP</b>                     | ---          | 17          | <b>42</b>   | 60.8                | 100                 | 6/12            | 28              | 13.4           |
| <b>MT 2019</b>                       | ---          | ---         | <b>41</b>   | 58.6                | 99                  | 6/16            | 25              | 13.7           |
| <b>Flathead</b>                      | 30           | 15          | <b>40</b>   | 59.3                | 100                 | 6/12            | 29              | 13.3           |
| <b>IDO2006 (W)</b>                   | 37           | 14          | <b>40</b>   | 56.0                | 99                  | 6/19            | 27              | 15.0           |
| Juniper                              | 34           | 17          | 39          | 59.2                | 100                 | 6/13            | 37              | 13.7           |
| MT Warcat                            | ---          | ---         | 38          | 58.1                | 98                  | 6/18            | 24              | 13.8           |
| UT11223-10                           | ---          | ---         | 38          | 57.0                | 88                  | 6/19            | 29              | 12.2           |
| LCS Jet                              | 31           | 16          | 38          | 54.6                | 100                 | 6/17            | 24              | 13.2           |
| Sequoia                              | 47           | 17          | 38          | 57.4                | 95                  | 6/19            | 33              | 13.4           |
| Millie (W)                           | 40           | 15          | 37          | 56.2                | 81                  | 6/15            | 33              | 14.8           |
| UI Silver                            | 46           | 18          | 37          | 58.8                | 96                  | 6/16            | 31              | 12.4           |
| UI SRG                               | 38           | 18          | 37          | 57.4                | 98                  | 6/15            | 35              | 13.7           |
| Promontory                           | 40           | 17          | 37          | 59.0                | 100                 | 6/15            | 39              | 13.3           |
| Utah-100                             | 39           | 17          | 36          | 59.1                | 100                 | 6/17            | 26              | 14.7           |
| UT11317-8                            | ---          | ---         | 36          | 54.9                | 100                 | 6/18            | 34              | 13.3           |
| Golden Spike                         | 29           | 15          | 36          | 57.7                | 99                  | 6/17            | 33              | 11.9           |
| OR2190064R                           | 31           | 14          | 35          | 56.5                | 100                 | 6/18            | 24              | 14.8           |
| Scorpio                              | 39           | 16          | 35          | 56.2                | 100                 | 6/19            | 25              | 13.2           |
| Irv (W)                              | 40           | 16          | 34          | 56.2                | 100                 | 6/17            | 27              | 14.5           |
| UI Bronze Jade (W)                   | 37           | 12          | 33          | 55.6                | 100                 | 6/17            | 27              | 13.3           |
| WB4303                               | ---          | ---         | 31          | 58.9                | 100                 | 6/12            | 27              | 13.5           |
| <b>Average</b>                       | <b>35</b>    | <b>16</b>   | <b>38</b>   | <b>57.6</b>         | <b>96</b>           | <b>6/16</b>     | <b>29</b>       | <b>13.7</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>9</b>     | <b>3</b>    | <b>6</b>    | <b>2</b>            | <b>12</b>           | <b>1</b>        | <b>2</b>        | <b>---</b>     |
| <b>CV (%)</b>                        | <b>12.8</b>  | <b>12.8</b> | <b>11.3</b> | <b>2.1</b>          | <b>9.2</b>          | <b>0.6</b>      | <b>4.7</b>      | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

No lodging to report.

Table 12. Agronomic Data for Hard Winter Wheat at Soda Springs, Dryland, 2022-23.

| Variety or Selection                  | Yield (bu/A) |             |             | Test Wt.<br>(lb/bu)** | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|---------------------------------------|--------------|-------------|-------------|-----------------------|---------------------|-----------------|-----------------|----------------|
|                                       | 2020         | 2022        | 2023*       |                       |                     |                 |                 |                |
| <b>IDO2006 (W)</b>                    | ---          | 47          | <b>43</b>   | 55.7                  | 68                  | 7/12            | 23              | 13.4           |
| <b>Yellowstone</b>                    | 58           | 46          | <b>43</b>   | 58.4                  | 96                  | 7/11            | 26              | 14.3           |
| <b>UT11317-8</b>                      | ---          | ---         | <b>42</b>   | 55.1                  | 80                  | 7/13            | 28              | 13.0           |
| <b>UT11223-10</b>                     | ---          | ---         | <b>40</b>   | 58.5                  | 85                  | 7/11            | 26              | 13.2           |
| <b>Golden Spike (W)</b>               | 58           | 44          | <b>39</b>   | 58.2                  | 88                  | 7/11            | 27              | 13.9           |
| <b>FourOsix</b>                       | 65           | 47          | <b>39</b>   | 57.6                  | 93                  | 7/9             | 23              | 14.0           |
| <b>NuMont (W)</b>                     | ---          | ---         | <b>39</b>   | 59.1                  | 96                  | 7/11            | 24              | 14.2           |
| <b>MT2019</b>                         | ---          | ---         | <b>39</b>   | 59.4                  | 86                  | 7/12            | 21              | 14.8           |
| <b>MT1745</b>                         | ---          | 40          | <b>38</b>   | 59.2                  | 86                  | 7/11            | 23              | 14.1           |
| <b>Sequoia</b>                        | 64           | 53          | <b>38</b>   | 55.0                  | 85                  | 7/15            | 28              | 13.7           |
| <b>MT Warcat</b>                      | ---          | ---         | <b>37</b>   | 58.8                  | 90                  | 7/12            | 21              | 14.9           |
| Millie (W)                            | 53           | 44          | 35          | 56.9                  | 90                  | 7/12            | 27              | 15.2           |
| Scorpio                               | 58           | 43          | 35          | 51.0                  | 21                  | 7/11            | 19              | 14.4           |
| Flathead                              | 47           | 44          | 32          | 60.0                  | 93                  | 7/7             | 24              | 13.4           |
| Promontory                            | 38           | 49          | 32          | 56.6                  | 81                  | 7/11            | 29              | 15.6           |
| UI Silver                             | 55           | 50          | 32          | 59.4                  | 86                  | 7/10            | 25              | 13.6           |
| UI Bronze Jade (W)                    | 66           | 52          | 31          | 57.1                  | 90                  | 7/11            | 24              | 15.2           |
| Milestone                             | ---          | ---         | 31          | 56.6                  | 64                  | 7/12            | 20              | 14.2           |
| UI SRG                                | 58           | 51          | 29          | 57.8                  | 85                  | 7/13            | 28              | 15.5           |
| LCS Jet                               | 62           | 55          | 29          | 54.3                  | 31                  | 7/13            | 17              | 13.6           |
| Keldin                                | 48           | 50          | 28          | 58.0                  | 89                  | 7/12            | 22              | 15.0           |
| Juniper                               | 49           | 44          | 27          | 58.7                  | 84                  | 7/8             | 18              | 15.0           |
| Keldin + 11-52-0                      | 55           | 52          | 27          | 58.5                  | 76                  | 7/11            | 21              | 13.1           |
| WB4510CLP                             | ---          | 48          | 27          | 60.6                  | 76                  | 7/11            | 22              | 14.4           |
| WB4422                                | ---          | ---         | 25          | 60.1                  | 89                  | 7/8             | 21              | 14.4           |
| Utah-100                              | ---          | ---         | 23          | 54.5                  | 23                  | 7/13            | 19              | 14.9           |
| OR2190064R                            | ---          | ---         | 21          | 52.0                  | 13                  | 7/14            | 18              | 14.1           |
| Irv (W)                               | 53           | 40          | 16          | 54.0                  | 15                  | 7/10            | 20              | 14.0           |
| WB4303                                | ---          | ---         | 15          | 57.0                  | 48                  | 7/9             | 17              | 15.1           |
| <b>Average</b>                        | <b>55</b>    | <b>46</b>   | <b>31</b>   | <b>57.2</b>           | <b>70</b>           | <b>7/11</b>     | <b>22</b>       | <b>14.3</b>    |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>14</b>    | <b>10</b>   | <b>8</b>    | <b>2</b>              | <b>19</b>           | <b>2</b>        | <b>4</b>        | <b>---</b>     |
| <b>CV (%)</b>                         | <b>17.2</b>  | <b>13.6</b> | <b>19.8</b> | <b>2.5</b>            | <b>18.8</b>         | <b>0.6</b>      | <b>11.6</b>     | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Test weight data was from the harvestmaster.

(W) = Hard White Winter

No lodging to report.

**Table 13. Hard Winter Wheat Yield Percentage of Location Averages, 2022-23.**

| Variety or Selection           | Aberdeen   | Kimberly   | Ririe Irrigated | Ririe Dryland | Soda Springs | Variety Average |
|--------------------------------|------------|------------|-----------------|---------------|--------------|-----------------|
| NuMont (W)                     | ---        | ---        | ---             | ---           | 126          | <b>126</b>      |
| MT 2019                        | ---        | ---        | ---             | 106           | 125          | <b>116</b>      |
| UT11317-8                      | ---        | ---        | ---             | 94            | 136          | <b>115</b>      |
| UT11223-10                     | ---        | ---        | ---             | 99            | 128          | <b>114</b>      |
| Yellowstone                    | 103        | 107        | 100             | 116           | 138          | <b>113</b>      |
| IDO2006 (W)                    | 108        | 100        | 110             | 104           | 140          | <b>112</b>      |
| MT1491 (W)                     | ---        | ---        | ---             | 112           | ---          | <b>112</b>      |
| Sequoia                        | ---        | ---        | ---             | 98            | 123          | <b>110</b>      |
| Golden Spike                   | ---        | ---        | ---             | 93            | 127          | <b>110</b>      |
| MT Warcat                      | ---        | ---        | ---             | 100           | 120          | <b>110</b>      |
| FourOsix                       | 105        | 99         | 99              | 116           | 126          | <b>109</b>      |
| MT1745                         | 103        | 109        | 94              | 114           | 124          | <b>109</b>      |
| Flathead                       | 104        | 112        | 120             | 105           | 104          | <b>109</b>      |
| WB4401                         | 107        | 106        | 103             | ---           | ---          | <b>105</b>      |
| Keldin                         | 103        | 108        | 114             | 109           | 91           | <b>105</b>      |
| Keldin + 11-52-0               | 101        | 103        | 111             | 119           | 88           | <b>104</b>      |
| WB4510CLP                      | 103        | 109        | 111             | 109           | 86           | <b>104</b>      |
| Milestone                      | 102        | 106        | 102             | ---           | 101          | <b>103</b>      |
| UI Silver                      | ---        | ---        | ---             | 97            | 103          | <b>100</b>      |
| WB4422                         | 100        | 102        | 98              | 120           | 80           | <b>100</b>      |
| Promontory                     | ---        | ---        | ---             | 95            | 103          | <b>99</b>       |
| Scorpio                        | 104        | 95         | 90              | 92            | 112          | <b>99</b>       |
| UI Bronze Jade (W)             | 101        | 102        | 97              | 87            | 102          | <b>98</b>       |
| LCS Jet                        | 96         | 94         | 106             | 98            | 93           | <b>98</b>       |
| LCS Rocket                     | 100        | 96         | 95              | ---           | ---          | <b>97</b>       |
| Apst52                         | 93         | 101        | 97              | ---           | ---          | <b>97</b>       |
| UI SRG                         | ---        | ---        | ---             | 96            | 95           | <b>96</b>       |
| Kairos                         | 92         | 86         | 108             | ---           | ---          | <b>95</b>       |
| Millie (W)                     | 93         | 89         | 83              | 97            | 113          | <b>95</b>       |
| Juniper                        | ---        | ---        | ---             | 102           | 88           | <b>95</b>       |
| HSG108                         | 96         | 84         | ---             | ---           | ---          | <b>90</b>       |
| Balance                        | 95         | 92         | 82              | ---           | ---          | <b>90</b>       |
| WB4303                         | 102        | 106        | 105             | 81            | 47           | <b>88</b>       |
| OR2190064R                     | 95         | 92         | 84              | 92            | 68           | <b>86</b>       |
| Utah-100                       | ---        | ---        | ---             | 95            | 74           | <b>84</b>       |
| Irv (W)                        | ---        | ---        | ---             | 89            | 51           | <b>70</b>       |
| <b>Location Average (bu/A)</b> | <b>156</b> | <b>158</b> | <b>133</b>      | <b>38</b>     | <b>31</b>    |                 |

(W) = White

Chart 2. 2023 Hard Winter Wheat Yield Percentage Across All Locations  
(Average=100%)

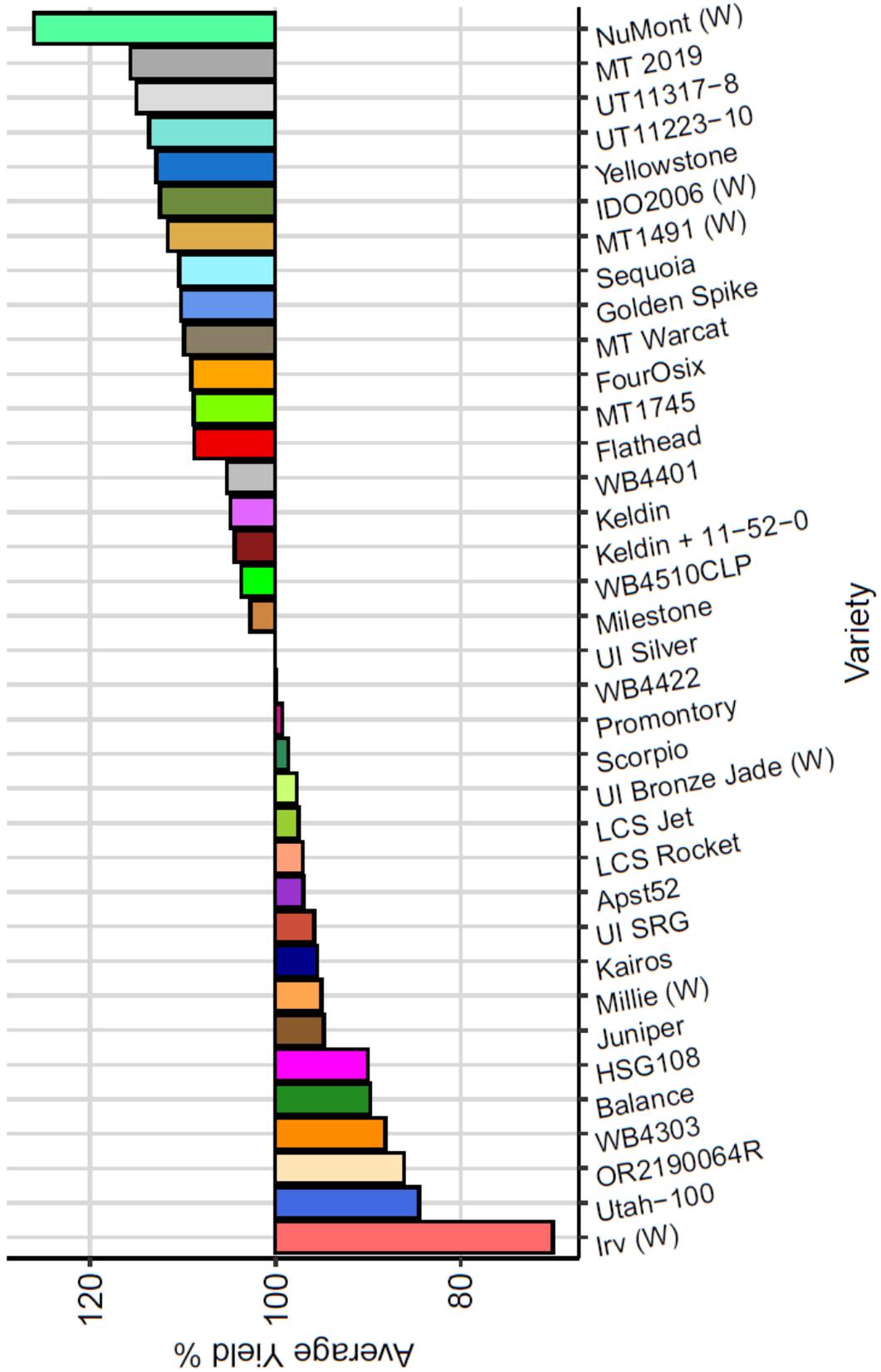


Table 14. Soft White Winter Wheat Irrigated Nurseries, 3-Year Averages (2021-2023; 11 site-years).

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|
| <b>AP Exceed</b>                     | <b>155</b>       | 57.3                | 99                  | 6/6             | 36              | 1              | 10.7           |
| <b>LCS Hulk</b>                      | <b>152</b>       | 57.0                | 99                  | 6/9             | 38              | 5              | 11.4           |
| <b>Sockeye CL+</b>                   | <b>152</b>       | 55.1                | 98                  | 6/11            | 41              | 7              | 11.3           |
| <b>WB1783</b>                        | <b>152</b>       | 57.7                | 99                  | 6/9             | 38              | 4              | 10.8           |
| <b>UIL13-046145A</b>                 | <b>152</b>       | 57.9                | 98                  | 6/7             | 38              | 8              | 10.4           |
| <b>SY Ovation</b>                    | <b>149</b>       | 55.1                | 98                  | 6/9             | 38              | 5              | 11.0           |
| WA8415                               | 148              | 57.1                | 98                  | 6/10            | 41              | 3              | 11.3           |
| Piranha CL+                          | 148              | 55.7                | 98                  | 6/11            | 41              | 7              | 10.9           |
| LCS Blackjack                        | 147              | 55.4                | 98                  | 6/9             | 37              | 0              | 11.2           |
| UIL15-028024                         | 147              | 57.1                | 98                  | 6/10            | 38              | 10             | 10.9           |
| WB1529                               | 144              | 55.0                | 97                  | 6/8             | 35              | 4              | 10.8           |
| AP Iliad                             | 143              | 57.0                | 98                  | 6/7             | 36              | 4              | 11.3           |
| SY Assure                            | 143              | 55.7                | 97                  | 6/4             | 34              | 3              | 11.0           |
| VI Shock                             | 141              | 55.0                | 95                  | 6/10            | 38              | 0              | 10.8           |
| Norwest Tandem                       | 141              | 55.7                | 99                  | 6/7             | 34              | 0              | 11.1           |
| Stingray CL+                         | 140              | 54.8                | 95                  | 6/10            | 37              | 5              | 11.6           |
| IDO1708                              | 140              | 55.1                | 98                  | 6/7             | 37              | 10             | 11.3           |
| OR2160243                            | 140              | 55.4                | 97                  | 6/8             | 36              | 3              | 11.0           |
| OR2160264                            | 139              | 55.4                | 98                  | 6/7             | 36              | 1              | 11.5           |
| VI Presto CL+                        | 139              | 57.7                | 98                  | 6/11            | 40              | 0              | 11.4           |
| UI Sparrow                           | 138              | 54.8                | 96                  | 6/12            | 42              | 8              | 11.5           |
| WB 456                               | 137              | 54.6                | 97                  | 6/6             | 37              | 6              | 12.1           |
| Stephens                             | 136              | 55.2                | 97                  | 6/8             | 38              | 9              | 11.2           |
| UI Magic CL+                         | 136              | 55.2                | 94                  | 6/7             | 36              | 7              | 11.1           |
| WB1376CLP                            | 135              | 55.2                | 97                  | 6/8             | 38              | 0              | 11.8           |
| VI Voodoo CL+                        | 123              | 55.2                | 94                  | 6/11            | 34              | 0              | 11.1           |
| <b>Average</b>                       | <b>143</b>       | <b>56.5</b>         | <b>97</b>           | <b>6/8</b>      | <b>37</b>       | <b>4</b>       | <b>11.1</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>6</b>         | <b>1</b>            | <b>3</b>            | <b>1</b>        | <b>1</b>        | <b>5</b>       | <b>1</b>       |
| <b>CV (%)</b>                        | <b>9.5</b>       | <b>2.9</b>          | <b>7.6</b>          | <b>1.1</b>      | <b>4.4</b>      | <b>239.0</b>   | <b>6.4</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

Table 15. Soft White Winter Wheat Dryland Nurseries, 3-Year Averages (2021-2023; 6 site years).

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Stand (%)   | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|-------------|-----------------|-----------------|----------------|
| <b>Sockeye CL+</b>                   | <b>46</b>        | 53.2                | 95          | 6/24            | 29              | 12.2           |
| <b>Piranha CL+</b>                   | <b>44</b>        | 53.6                | 90          | 6/24            | 27              | 12.5           |
| SY Ovation                           | 34               | 54.8                | 87          | 6/20            | 24              | 12.3           |
| Eltan 11-52-0                        | 34               | 54.0                | 88          | 6/23            | 25              | 12.5           |
| Otto                                 | 32               | 53.8                | 91          | 6/23            | 25              | 12.9           |
| WB1783                               | 32               | 56.9                | 89          | 6/20            | 25              | 12.6           |
| Norwest Duet                         | 32               | 53.2                | 91          | 6/21            | 25              | 12.2           |
| UI Sparrow                           | 32               | 53.4                | 92          | 6/24            | 26              | 12.2           |
| Devote                               | 31               | 55.6                | 92          | 6/24            | 23              | 12.2           |
| Eltan                                | 30               | 54.0                | 94          | 6/23            | 24              | 12.0           |
| WB 456                               | 29               | 54.3                | 90          | 6/19            | 23              | 12.7           |
| UI Magic CL+                         | 28               | 54.2                | 86          | 6/20            | 23              | 12.9           |
| SY Assure                            | 27               | 54.6                | 82          | 6/18            | 22              | 12.3           |
| WB1376CLP                            | 27               | 54.9                | 87          | 6/20            | 24              | 13.2           |
| Stephens                             | 25               | 52.6                | 86          | 6/20            | 24              | 12.6           |
| <b>Average</b>                       | <b>32</b>        | <b>54.2</b>         | <b>89</b>   | <b>6/21</b>     | <b>24</b>       | <b>12.4</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>3</b>         | <b>1</b>            | <b>6</b>    | <b>1</b>        | <b>1</b>        | <b>3 (NS)</b>  |
| <b>CV (%)</b>                        | <b>18.4</b>      | <b>2.3</b>          | <b>11.4</b> | <b>0.7</b>      | <b>6.2</b>      | <b>3.4</b>     |

\* Variety or selection in bold are not statistically different from the top yielding variety.

NS: Non-significant

No lodging to report.

Table 16. Irrigated Soft White Winter Wheat Data Combined from Aberdeen, Kimberly, and Ririe, 2022-23.

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|
| AP Exceed                            | 156              | 58.7                | 96                  | 6/8             | 34              | 10.3           |
| Sockeye CL+                          | 153              | 56.2                | 95                  | 6/10            | 41              | 10.0           |
| LCS Hulk                             | 152              | 58.6                | 98                  | 6/10            | 37              | 11.0           |
| SY Ovation                           | 152              | 57.2                | 94                  | 6/11            | 36              | 10.7           |
| UIL13-046145A                        | 149              | 57.0                | 92                  | 6/9             | 36              | 10.2           |
| WB1621                               | 146              | 59.7                | 95                  | 6/10            | 35              | 10.4           |
| UIL17-995133B                        | 144              | 57.2                | 93                  | 6/8             | 34              | 9.9            |
| UIL15-028024                         | 143              | 57.5                | 95                  | 6/11            | 37              | 10.8           |
| WB1783                               | 142              | 59.5                | 97                  | 6/12            | 36              | 10.4           |
| Piranha CL+                          | 141              | 56.2                | 97                  | 6/10            | 41              | 10.6           |
| UIL14-211120A                        | 141              | 55.9                | 90                  | 6/10            | 38              | 10.8           |
| WA8415                               | 141              | 55.9                | 95                  | 6/12            | 39              | 10.9           |
| WB1529                               | 140              | 59.3                | 89                  | 6/11            | 32              | 10.5           |
| Norwest Tandem                       | 138              | 56.7                | 97                  | 6/8             | 31              | 11.2           |
| LCS Blackjack                        | 137              | 55.5                | 93                  | 6/10            | 35              | 11.3           |
| Stingray CL+                         | 137              | 56.1                | 82                  | 6/11            | 36              | 10.8           |
| TMC M-Pire                           | 135              | 57.0                | 92                  | 6/12            | 32              | 11.3           |
| VI Shock                             | 135              | 56.4                | 89                  | 6/10            | 36              | 10.1           |
| VI Presto CL+                        | 135              | 58.1                | 97                  | 6/11            | 38              | 10.4           |
| Nimbus                               | 135              | 56.0                | 91                  | 6/9             | 39              | 10.9           |
| IDO1708                              | 134              | 56.1                | 95                  | 6/10            | 35              | 10.1           |
| Stephens                             | 132              | 55.9                | 91                  | 6/9             | 36              | 10.6           |
| UI Sparrow                           | 131              | 54.8                | 87                  | 6/16            | 42              | 11.3           |
| AP Iliad                             | 130              | 57.3                | 93                  | 6/10            | 34              | 11.3           |
| OR2160243                            | 129              | 56.6                | 91                  | 6/12            | 34              | 10.0           |
| OR2160264                            | 127              | 55.2                | 96                  | 6/10            | 35              | 11.1           |
| WB 456                               | 126              | 58.7                | 92                  | 6/9             | 35              | 12.0           |
| UI Magic CL+                         | 125              | 58.0                | 82                  | 6/10            | 35              | 10.6           |
| WB1376CLP                            | 120              | 59.4                | 90                  | 6/10            | 36              | 11.5           |
| SY Assure                            | 119              | 58.1                | 89                  | 6/8             | 31              | 10.9           |
| OR2170559                            | 116              | 55.7                | 97                  | 6/11            | 33              | 10.5           |
| VI Voodoo CL+                        | 104              | 55.7                | 89                  | 6/11            | 32              | 10.7           |
| ORI2190027CL+                        | 97               | 56.8                | 87                  | 6/10            | 33              | 11.2           |
| <b>Average</b>                       | <b>134</b>       | <b>57.0</b>         | <b>92</b>           | <b>6/11</b>     | <b>35</b>       | <b>10.7</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>13</b>        | <b>1</b>            | <b>11</b>           | <b>2</b>        | <b>1</b>        | <b>1</b>       |
| <b>CV (%)</b>                        | <b>11.8</b>      | <b>2.5</b>          | <b>14.5</b>         | <b>1.3</b>      | <b>4.2</b>      | <b>5.0</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

No lodging to report.

Table 17. Dryland Soft White Winter Wheat Data Combined from Ririe and Soda Springs, 2022-23.

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|
| <b>Sockeye CL+</b>                   | <b>40</b>        | 54.3                | 90                  | 6/29            | 26              | 13.9           |
| <b>Norwest Tandem</b>                | <b>39</b>        | 54.9                | 87                  | 6/24            | 23              | 13.4           |
| <b>Piranha CL+</b>                   | <b>39</b>        | 54.4                | 81                  | 6/29            | 24              | 13.5           |
| <b>UIL15-028024</b>                  | <b>38</b>        | 56.8                | 88                  | 7/1             | 24              | 13.2           |
| <b>Otto</b>                          | <b>37</b>        | 55.1                | 82                  | 6/28            | 26              | 13.0           |
| <b>UIL14-211120A</b>                 | <b>37</b>        | 55.7                | 94                  | 6/27            | 26              | 12.7           |
| <b>LCS Hulk</b>                      | <b>36</b>        | 55.5                | 83                  | 6/29            | 24              | 13.1           |
| <b>Eltan</b>                         | <b>36</b>        | 55.3                | 93                  | 7/1             | 24              | 12.8           |
| <b>UIL13-046145A</b>                 | <b>36</b>        | 55.0                | 93                  | 6/27            | 25              | 12.5           |
| <b>Eltan 11-52-0</b>                 | <b>36</b>        | 55.6                | 78                  | 7/1             | 24              | 13.0           |
| <b>UI Sparrow</b>                    | <b>36</b>        | 54.9                | 90                  | 7/2             | 26              | 12.7           |
| Nimbus                               | 35               | 54.4                | 76                  | 6/28            | 25              | 13.5           |
| UIL16-478001                         | 35               | 54.0                | 77                  | 6/29            | 25              | 12.2           |
| UIL17-995133B                        | 34               | 54.9                | 95                  | 6/27            | 24              | 12.1           |
| Devote                               | 34               | 57.1                | 89                  | 7/2             | 23              | 13.2           |
| WB1783                               | 33               | 58.8                | 78                  | 6/29            | 25              | 13.1           |
| AP Exceed                            | 33               | 55.2                | 84                  | 6/25            | 25              | 11.6           |
| SY Ovation                           | 33               | 55.4                | 71                  | 6/28            | 24              | 13.5           |
| Norwest Duet                         | 33               | 54.7                | 84                  | 6/28            | 26              | 12.8           |
| VI Presto CL+                        | 32               | 57.0                | 90                  | 6/26            | 24              | 12.5           |
| UIL17-7706 (CL+)                     | 31               | 52.3                | 73                  | 6/28            | 23              | 13.0           |
| TMC M-Pire                           | 31               | 55.6                | 71                  | 6/28            | 23              | 13.0           |
| WB 456                               | 30               | 57.1                | 84                  | 6/27            | 23              | 13.2           |
| UI Magic CL+                         | 29               | 55.6                | 76                  | 6/27            | 23              | 13.9           |
| IDO1708                              | 26               | 53.0                | 74                  | 6/25            | 23              | 13.0           |
| Stephens                             | 26               | 54.0                | 72                  | 6/27            | 24              | 12.8           |
| WB1376CLP                            | 26               | 57.8                | 81                  | 6/29            | 24              | 13.0           |
| WB1621                               | 25               | 58.3                | 79                  | 6/26            | 23              | 11.7           |
| APIliad                              | 25               | 54.6                | 63                  | 6/27            | 23              | 13.9           |
| SY Assure                            | 24               | 56.2                | 57                  | 6/25            | 22              | 13.6           |
| VI Voodoo CL+                        | 22               | 52.9                | 53                  | 6/23            | 20              | 12.8           |
| Appleby CL+                          | 19               | 54.4                | 55                  | 6/27            | 22              | 13.3           |
| ORI2190027CL+                        | 19               | 53.9                | 52                  | 6/17            | 22              | 13.5           |
| <b>Average</b>                       | <b>32</b>        | <b>55.2</b>         | <b>79</b>           | <b>6/28</b>     | <b>24</b>       | <b>12.9</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>6</b>         | <b>1</b>            | <b>15</b>           | <b>2</b>        | <b>1</b>        | <b>1</b>       |
| <b>CV (%)</b>                        | <b>19.2</b>      | <b>2.5</b>          | <b>19.6</b>         | <b>0.9</b>      | <b>5.9</b>      | <b>5.6</b>     |

\* Variety or selection in bold are not statistically different from the top yielding variety.  
No lodging in these trials.

Table 18. Agronomic Data for Soft White Winter Wheat at Kimberly, Irrigated, 2022-23.

| Variety or Selection                 | Yield (bu/A) |            |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|------------|------------|---------------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2021         | 2022       | 2023*      |                     |                     |                 |                 |                |
| SY Ovation                           | 146          | 168        | <b>167</b> | 59.5                | 100                 | 6/7             | 38              | 9.6            |
| Sockeye CL+                          | 118          | 191        | <b>161</b> | 59.1                | 99                  | 6/7             | 43              | 8.6            |
| LCS Hulk                             | 137          | 176        | <b>161</b> | 58.2                | 100                 | 6/7             | 37              | 9.7            |
| AP Exceed                            | 164          | 168        | <b>156</b> | 57.6                | 100                 | 6/4             | 35              | 8.7            |
| Piranha CL+                          | 132          | 178        | <b>151</b> | 58.9                | 100                 | 6/6             | 41              | 8.3            |
| AP Iliad                             | 149          | 151        | 150        | 57.7                | 100                 | 6/5             | 36              | 9.6            |
| UIL17-995133B                        | ---          | ---        | 150        | 59.9                | 100                 | 6/5             | 35              | 8.3            |
| UIL15-028024                         | 134          | 168        | 150        | 59.9                | 98                  | 6/5             | 39              | 8.6            |
| WB1783                               | 152          | 170        | 149        | 61.7                | 100                 | 6/7             | 37              | 9.4            |
| WA8415                               | 126          | 163        | 149        | 60.7                | 100                 | 6/8             | 40              | 8.8            |
| Stingray CL+                         | 138          | 161        | 145        | 59.4                | 100                 | 6/9             | 36              | 8.7            |
| UIL13-046145A                        | 142          | 174        | 145        | 59.9                | 100                 | 6/4             | 37              | 8.2            |
| WB1621                               | ---          | 171        | 144        | 61.4                | 100                 | 6/4             | 36              | 8.7            |
| UIL14-211120A                        | ---          | ---        | 143        | 59.9                | 100                 | 6/6             | 37              | 8.5            |
| TMC M-Pire                           | ---          | ---        | 142        | 59.6                | 100                 | 6/7             | 32              | 8.8            |
| Norwest Tandem                       | 132          | 166        | 141        | 58.3                | 100                 | 6/3             | 39              | 9.3            |
| Nimbus                               | ---          | ---        | 140        | 58.4                | 98                  | 6/4             | 32              | 9.1            |
| UI Sparrow                           | 122          | 166        | 139        | 59.7                | 100                 | 6/15            | 43              | 9.2            |
| LCS Blackjack                        | 146          | 177        | 137        | 58.0                | 100                 | 6/7             | 35              | 9.3            |
| WB1529                               | 140          | 160        | 135        | 61.2                | 100                 | 6/6             | 33              | 9.1            |
| VI Shock                             | 145          | 169        | 133        | 60.0                | 100                 | 6/6             | 37              | 7.7            |
| Stephens                             | 139          | 164        | 132        | 59.2                | 99                  | 6/6             | 36              | 8.9            |
| IDO1708                              | 127          | 182        | 130        | 57.9                | 98                  | 6/5             | 36              | 8.2            |
| WB 456                               | 129          | 152        | 130        | 60.9                | 100                 | 6/5             | 36              | 10.2           |
| SY Assure                            | 150          | 164        | 127        | 59.5                | 98                  | 6/3             | 31              | 9.1            |
| VI Presto CL+                        | 137          | 160        | 126        | 60.0                | 99                  | 6/5             | 38              | 8.9            |
| WB1376CLP                            | 133          | 148        | 124        | 61.0                | 98                  | 6/6             | 37              | 9.9            |
| OR2160264                            | 155          | 163        | 121        | 58.5                | 93                  | 6/6             | 34              | 8.5            |
| UI Magic CL+                         | 140          | 153        | 109        | 59.7                | 93                  | 6/6             | 35              | 8.7            |
| OR2160243                            | 147          | 179        | 105        | 58.4                | 96                  | 6/8             | 34              | 7.8            |
| OR2170559                            | ---          | 167        | 101        | 58.7                | 97                  | 6/7             | 32              | 8.8            |
| VI Voodoo CL+                        | 132          | 163        | 97         | 60.4                | 89                  | 6/7             | 31              | 8.7            |
| ORI2190027CL+                        | ---          | ---        | 83         | 58.9                | 93                  | 6/6             | 31              | 9.0            |
| <b>Average</b>                       | <b>137</b>   | <b>167</b> | <b>136</b> | <b>59.4</b>         | <b>98</b>           | <b>6/6</b>      | <b>36</b>       | <b>8.9</b>     |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>15</b>    | <b>14</b>  | <b>16</b>  | <b>0.4</b>          | <b>6</b>            | <b>2</b>        | <b>2</b>        | ---            |
| <b>CV (%)</b>                        | <b>7.7</b>   | <b>5.8</b> | <b>8.2</b> | <b>0.6</b>          | <b>4.5</b>          | <b>0.9</b>      | <b>3.3</b>      | ---            |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

No lodging to report.

Table 19. Agronomic Data for Soft White Winter Wheat at Aberdeen, Irrigated, 2022-23.

| Variety or Selection                 | Yield (bu/A) |            |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2021         | 2022       | 2023*       |                     |                     |                 |                 |                |
| UIL14-211120A                        | ---          | ---        | <b>164</b>  | 54.5                | 100                 | 6/8             | 38              | 11.6           |
| LCS Hulk                             | 148          | 165        | <b>164</b>  | 55.5                | 100                 | 6/5             | 38              | 12.2           |
| UIL15-028024                         | 140          | 173        | <b>161</b>  | 56.0                | 100                 | 6/9             | 35              | 11.5           |
| AP Exceed                            | 140          | 162        | <b>160</b>  | 55.6                | 100                 | 6/8             | 32              | 11.5           |
| WB1621                               | ---          | 185        | <b>160</b>  | 57.2                | 96                  | 6/9             | 35              | 11.5           |
| SY Ovation                           | 147          | 155        | <b>159</b>  | 55.4                | 98                  | 6/6             | 35              | 11.7           |
| VI Shock                             | 143          | 174        | <b>159</b>  | 54.1                | 99                  | 6/6             | 35              | 11.1           |
| Sockeye CL+                          | 135          | 159        | <b>158</b>  | 53.4                | 100                 | 6/8             | 40              | 11.1           |
| UIL13-046145A                        | 153          | 168        | <b>156</b>  | 54.5                | 100                 | 6/7             | 35              | 10.9           |
| UIL17-995133B                        | ---          | ---        | <b>156</b>  | 55.0                | 99                  | 6/4             | 32              | 10.9           |
| TMC M-Pire                           | ---          | ---        | <b>154</b>  | 55.1                | 99                  | 6/10            | 32              | 11.9           |
| WA8415                               | 149          | 170        | <b>153</b>  | 53.4                | 100                 | 6/7             | 40              | 12.3           |
| WB1529                               | 136          | 164        | <b>153</b>  | 56.2                | 100                 | 6/9             | 33              | 11.8           |
| VI Presto CL+                        | 137          | 154        | <b>152</b>  | 55.1                | 100                 | 6/10            | 37              | 12.1           |
| Norwest Tandem                       | 134          | 162        | <b>151</b>  | 53.1                | 100                 | 6/5             | 31              | 11.8           |
| LCS Blackjack                        | 135          | 179        | <b>150</b>  | 53.8                | 100                 | 6/6             | 34              | 11.8           |
| OR2160264                            | 142          | 165        | <b>150</b>  | 53.1                | 100                 | 6/6             | 35              | 12.1           |
| Stephens                             | 136          | 156        | <b>148</b>  | 54.1                | 95                  | 6/4             | 36              | 11.6           |
| Nimbus                               | ---          | ---        | <b>147</b>  | 54.2                | 100                 | 6/9             | 39              | 11.9           |
| WB1783                               | 150          | 179        | <b>147</b>  | 56.5                | 98                  | 6/11            | 34              | 11.0           |
| Piranha CL+                          | 143          | 169        | <b>146</b>  | 53.1                | 100                 | 6/8             | 41              | 12.2           |
| IDO1708                              | 129          | 152        | <b>143</b>  | 53.6                | 98                  | 6/7             | 33              | 11.3           |
| Stingray CL+                         | 136          | 163        | 139         | 53.5                | 84                  | 6/6             | 36              | 11.9           |
| OR2160243                            | 132          | 155        | 138         | 53.5                | 99                  | 6/11            | 34              | 12.1           |
| UI Sparrow                           | 132          | 151        | 137         | 52.0                | 98                  | 6/8             | 40              | 12.3           |
| UI Magic CL+                         | 132          | 164        | 135         | 56.0                | 98                  | 6/6             | 35              | 11.9           |
| WB1376CLP                            | 135          | 154        | 133         | 56.1                | 98                  | 6/8             | 34              | 12.8           |
| WB 456                               | 122          | 150        | 129         | 55.6                | 100                 | 6/7             | 35              | 12.9           |
| AP Iliad                             | 143          | 159        | 127         | 53.9                | 99                  | 6/7             | 32              | 12.7           |
| SY Assure                            | 143          | 165        | 119         | 54.5                | 88                  | 6/7             | 29              | 12.7           |
| OR2170559                            | ---          | 162        | 116         | 52.4                | 100                 | 6/8             | 32              | 12.1           |
| ORI2190027CL+                        | ---          | ---        | 107         | 54.2                | 100                 | 6/6             | 34              | 12.0           |
| VI Voodoo CL+                        | 137          | 150        | 88          | 51.0                | 100                 | 6/9             | 31              | 12.0           |
| <b>Average</b>                       | <b>137</b>   | <b>162</b> | <b>144</b>  | <b>54.4</b>         | <b>98</b>           | <b>6/7</b>      | <b>35</b>       | <b>11.9</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>17</b>    | <b>22</b>  | <b>23</b>   | <b>1</b>            | <b>8</b>            | <b>5</b>        | <b>3</b>        | <b>---</b>     |
| <b>CV (%)</b>                        | <b>8.9</b>   | <b>9.4</b> | <b>11.6</b> | <b>2.0</b>          | <b>5.4</b>          | <b>2.0</b>      | <b>5.2</b>      | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

No lodging to report.

Table 20. Agronomic Data for Soft White Winter Wheat at Ririe, Irrigated, 2022-23.

| Variety or Selection                 | Yield (bu/A) |            |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2021         | 2022       | 2023*       |                     |                     |                 |                 |                |
| AP Exceed                            | 144          | 166        | <b>139</b>  | 60.1                | 88                  | 6/13            | 34              | 10.6           |
| WB1621                               | ---          | 167        | <b>134</b>  | 61.1                | 88                  | 6/17            | 35              | 10.9           |
| LCS Hulk                             | 142          | 171        | <b>132</b>  | 59.2                | 96                  | 6/18            | 36              | 11.0           |
| OR2160243                            | 123          | 147        | <b>131</b>  | 58.0                | 78                  | 6/18            | 34              | 10.1           |
| WB1783                               | 140          | 168        | <b>130</b>  | 60.6                | 93                  | 6/18            | 36              | 10.7           |
| OR2170559                            | ---          | 149        | <b>129</b>  | 57.1                | 94                  | 6/18            | 34              | 10.7           |
| IDO1708                              | 136          | 161        | <b>129</b>  | 57.0                | 89                  | 6/16            | 35              | 10.9           |
| SY Ovation                           | 133          | 151        | <b>128</b>  | 56.5                | 86                  | 6/19            | 37              | 10.9           |
| UIL 17-995133B                       | ---          | ---        | <b>127</b>  | 57.0                | 80                  | 6/16            | 35              | 10.6           |
| Piranha CL+                          | 129          | 156        | <b>126</b>  | 56.5                | 91                  | 6/16            | 41              | 11.4           |
| UIL13-046145A                        | 147          | 168        | <b>122</b>  | 56.8                | 77                  | 6/16            | 36              | 11.6           |
| Norwest Tandem                       | 130          | 165        | <b>121</b>  | 56.3                | 93                  | 6/15            | 32              | 11.8           |
| VI Voodoo CL+                        | 120          | 117        | <b>121</b>  | 56.8                | 78                  | 6/18            | 32              | 11.4           |
| WA8415                               | 133          | 164        | <b>120</b>  | 54.6                | 85                  | 6/20            | 39              | 11.6           |
| UIL15-028024                         | 148          | 155        | <b>118</b>  | 56.5                | 87                  | 6/18            | 38              | 12.3           |
| Sockeye CL+                          | 129          | 152        | <b>118</b>  | 56.8                | 87                  | 6/17            | 40              | 10.2           |
| Nimbus                               | ---          | ---        | <b>116</b>  | 56.6                | 72                  | 6/15            | 40              | 12.3           |
| UI Magic CL+                         | 129          | 136        | <b>116</b>  | 59.0                | 56                  | 6/17            | 34              | 11.2           |
| Stephens                             | 123          | 140        | <b>115</b>  | 55.8                | 79                  | 6/16            | 37              | 11.4           |
| WB1529                               | 131          | 161        | <b>115</b>  | 61.1                | 66                  | 6/18            | 32              | 10.6           |
| VI Presto CL+                        | 129          | 152        | <b>113</b>  | 59.6                | 92                  | 6/18            | 38              | 10.3           |
| VI Shock                             | 140          | 145        | <b>113</b>  | 56.3                | 70                  | 6/18            | 36              | 11.4           |
| SY Assure                            | 136          | 160        | <b>112</b>  | 59.9                | 80                  | 6/13            | 31              | 11.0           |
| LCS Blackjack                        | 138          | 154        | <b>111</b>  | 54.8                | 80                  | 6/18            | 36              | 12.8           |
| TMC M-Pire                           | ---          | ---        | <b>110</b>  | 56.0                | 78                  | 6/18            | 32              | 13.1           |
| OR2160264                            | 123          | 136        | <b>110</b>  | 54.5                | 95                  | 6/17            | 35              | 12.8           |
| UIL 14-211120A                       | ---          | ---        | 107         | 54.9                | 70                  | 6/17            | 38              | 12.2           |
| WB 456                               | 129          | 171        | 106         | 59.4                | 76                  | 6/16            | 35              | 12.9           |
| AP Iliad                             | 136          | 161        | 105         | 58.2                | 80                  | 6/17            | 33              | 11.7           |
| WB1376CLP                            | 128          | 162        | 102         | 60.4                | 75                  | 6/17            | 36              | 11.7           |
| ORI2190027CL+                        | ---          | ---        | 101         | 56.7                | 68                  | 6/17            | 35              | 12.7           |
| Stingray CL+                         | 127          | 154        | 100         | 54.8                | 62                  | 6/19            | 36              | 11.9           |
| UI Sparrow                           | 123          | 162        | 98          | 53.8                | 63                  | 6/25            | 43              | 12.3           |
| <b>Average</b>                       | <b>131</b>   | <b>155</b> | <b>117</b>  | <b>57.3</b>         | <b>80</b>           | <b>6/17</b>     | <b>36</b>       | <b>11.5</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>9</b>     | <b>15</b>  | <b>31</b>   | <b>3</b>            | <b>31</b>           | <b>1</b>        | <b>2</b>        | <b>---</b>     |
| <b>CV (%)</b>                        | <b>5.0</b>   | <b>6.7</b> | <b>18.8</b> | <b>3.9</b>          | <b>27.5</b>         | <b>0.6</b>      | <b>4.1</b>      | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

No lodging to report.

Table 21. Agronomic Data for Soft White Winter Wheat at Ririe, Dryland, 2022-23.

| Variety or Selection                 | Yield (bu/A) |             |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|-------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2020         | 2021        | 2023*       |                     |                     |                 |                 |                |
| <b>UIL16-478001</b>                  | ---          | ---         | <b>42</b>   | 53.5                | 100                 | 6/18            | 29              | 11.1           |
| <b>Otto</b>                          | 46           | 18          | <b>40</b>   | 56.2                | 96                  | 6/20            | 28              | 11.8           |
| <b>Sockeye CL+</b>                   | 43           | 18          | <b>39</b>   | 53.7                | 96                  | 6/16            | 29              | 13.9           |
| <b>LCS Hulk</b>                      | 37           | 18          | <b>39</b>   | 54.6                | 100                 | 6/17            | 28              | 12.5           |
| <b>Devote</b>                        | 47           | 17          | <b>39</b>   | 57.8                | 100                 | 6/20            | 26              | 12.2           |
| <b>Eltan 11-52-0</b>                 | 47           | 19          | <b>38</b>   | 55.1                | 95                  | 6/19            | 27              | 11.6           |
| <b>Nimbus</b>                        | ---          | ---         | <b>38</b>   | 54.0                | 100                 | 6/16            | 28              | 13.7           |
| <b>TMC M-Pire</b>                    | ---          | ---         | <b>38</b>   | 56.2                | 100                 | 6/17            | 26              | 12.6           |
| <b>Piranha CL+</b>                   | 43           | 19          | <b>38</b>   | 54.0                | 99                  | 6/16            | 27              | 13.3           |
| <b>AP Exceed</b>                     | ---          | ---         | <b>38</b>   | 54.5                | 83                  | 6/14            | 29              | 12.0           |
| <b>Eltan</b>                         | 43           | 19          | <b>37</b>   | 55.3                | 99                  | 6/20            | 27              | 11.4           |
| <b>UIL13-046145A</b>                 | ---          | ---         | <b>37</b>   | 53.6                | 100                 | 6/16            | 28              | 12.4           |
| <b>WB 456</b>                        | 40           | 15          | <b>37</b>   | 57.3                | 95                  | 6/14            | 28              | 12.1           |
| <b>WB1376CLP</b>                     | 36           | 15          | <b>37</b>   | 58.4                | 99                  | 6/15            | 28              | 12.3           |
| <b>WB1783</b>                        | 41           | 21          | <b>36</b>   | 59.4                | 100                 | 6/17            | 29              | 11.6           |
| <b>Norwest Tandem</b>                | ---          | ---         | <b>36</b>   | 53.8                | 98                  | 6/16            | 26              | 13.6           |
| SY Assure                            | 34           | 16          | 35          | 56.0                | 100                 | 6/13            | 26              | 12.5           |
| UI Magic CL+                         | 34           | 17          | 35          | 56.0                | 100                 | 6/17            | 27              | 13.3           |
| UI Sparrow                           | 48           | 18          | 35          | 53.6                | 98                  | 6/22            | 27              | 12.5           |
| UIL17-995133B                        | ---          | ---         | 35          | 54.8                | 99                  | 6/16            | 27              | 11.7           |
| UIL15-028024                         | ---          | 19          | 35          | 56.9                | 100                 | 6/19            | 26              | 12.8           |
| UIL14-211120A                        | ---          | ---         | 34          | 55.7                | 100                 | 6/19            | 27              | 13.0           |
| WA8334                               | ---          | ---         | 34          | 55.6                | 100                 | 6/19            | 28              | 11.2           |
| SY Ovation                           | 42           | 17          | 34          | 57.5                | 100                 | 6/17            | 27              | 12.8           |
| WB1621                               | ---          | ---         | 34          | 58.8                | 98                  | 6/14            | 26              | 11.3           |
| IDO1708                              | 35           | 15          | 33          | 54.3                | 100                 | 6/14            | 27              | 12.2           |
| VI Voodoo CL+                        | 32           | 15          | 33          | 52.4                | 93                  | 6/18            | 24              | 12.8           |
| UIL 17-7706 (CL+)                    | ---          | 14          | 33          | 53.2                | 100                 | 6/19            | 27              | 12.9           |
| Norwest Duet                         | 40           | 16          | 33          | 54.4                | 88                  | 6/19            | 29              | 12.5           |
| VI Presto CL+                        | 33           | 19          | 32          | 56.9                | 98                  | 6/17            | 26              | 12.4           |
| AP Iliad                             | ---          | ---         | 32          | 55.1                | 99                  | 6/16            | 27              | 13.2           |
| ORI2190027CL+                        | ---          | ---         | 31          | 55.3                | 89                  | 6/17            | 26              | 13.2           |
| Stephens                             | 34           | 13          | 29          | 53.4                | 98                  | 6/17            | 27              | 12.1           |
| Appleby CL+                          | ---          | ---         | 29          | 55.7                | 100                 | 6/16            | 26              | 12.1           |
| <b>Average</b>                       | <b>39</b>    | <b>16</b>   | <b>35</b>   | <b>55.3</b>         | <b>98</b>           | <b>6/17</b>     | <b>27</b>       | <b>12.4</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>6</b>     | <b>3</b>    | <b>6</b>    | <b>2</b>            | <b>12</b>           | <b>2</b>        | <b>2</b>        | <b>---</b>     |
| <b>CV (%)</b>                        | <b>8.2</b>   | <b>11.9</b> | <b>12.6</b> | <b>2.6</b>          | <b>8.6</b>          | <b>0.7</b>      | <b>5.0</b>      | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

No lodging to report.

Table 22. Agronomic Data for Soft White Winter Wheat at Soda Springs, Dryland, 2022-23.

| Variety or Selection                  | Yield (bu/A) |             |             | Test Wt. **<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|---------------------------------------|--------------|-------------|-------------|------------------------|---------------------|-----------------|-----------------|----------------|
|                                       | 2020         | 2022        | 2023*       |                        |                     |                 |                 |                |
| <b>WA8415</b>                         | ---          | ---         | <b>45</b>   | 56.5                   | 75                  | 7/10            | 25              | 12.3           |
| <b>Norwest Tandem</b>                 | 60           | 42          | <b>43</b>   | 55.9                   | 76                  | 7/5             | 21              | 13.1           |
| <b>UIL15-028024</b>                   | ---          | 50          | <b>42</b>   | 56.7                   | 75                  | 7/13            | 21              | 13.5           |
| <b>Piranha CL+</b>                    | ---          | 52          | <b>41</b>   | 54.7                   | 63                  | 7/12            | 22              | 13.6           |
| <b>Sockeye CL+</b>                    | 49           | 59          | <b>40</b>   | 55.0                   | 80                  | 7/11            | 23              | 13.8           |
| <b>UIL14-211120A</b>                  | ---          | ---         | <b>39</b>   | 55.7                   | 91                  | 7/9             | 24              | 12.3           |
| <b>UI Sparrow</b>                     | 76           | 52          | <b>36</b>   | 56.2                   | 84                  | 7/11            | 24              | 12.8           |
| <b>Eltan</b>                          | 59           | 40          | <b>35</b>   | 55.3                   | 88                  | 7/12            | 21              | 14.2           |
| <b>UIL13-046145A</b>                  | ---          | ---         | <b>35</b>   | 56.4                   | 85                  | 7/8             | 22              | 12.6           |
| <b>WA8334</b>                         | ---          | 59          | <b>34</b>   | 50.0                   | 41                  | 7/12            | 22              | 13.1           |
| <b>LCS Hulk</b>                       | 62           | 50          | <b>34</b>   | 56.4                   | 65                  | 7/11            | 21              | 13.7           |
| <b>Otto</b>                           | 71           | 49          | <b>34</b>   | 54.1                   | 69                  | 7/13            | 23              | 14.1           |
| <b>UIL17-995133B</b>                  | ---          | ---         | <b>34</b>   | 55.0                   | 91                  | 7/8             | 20              | 12.5           |
| Eltan 11-52-0                         | 68           | 46          | 33          | 56.1                   | 64                  | 7/13            | 21              | 14.4           |
| Norwest Duet                          | 57           | 55          | 32          | 55.1                   | 68                  | 7/11            | 23              | 13.1           |
| Nimbus                                | ---          | ---         | 31          | 54.7                   | 57                  | 7/9             | 23              | 13.3           |
| SY Ovation                            | 55           | 54          | 31          | 53.4                   | 54                  | 7/12            | 22              | 14.1           |
| VI Presto CL+                         | 49           | 43          | 31          | 57.2                   | 80                  | 7/8             | 21              | 12.6           |
| <b>UIL17-7706 (CL+)</b>               | ---          | ---         | 29          | 51.3                   | 48                  | 7/11            | 20              | 13.1           |
| WB1783                                | 50           | 48          | 29          | 58.1                   | 56                  | 7/10            | 22              | 14.6           |
| Devote                                | 58           | 48          | 28          | 56.4                   | 78                  | 7/15            | 20              | 14.1           |
| UIL16-478001                          | ---          | 47          | 28          | 54.5                   | 56                  | 7/14            | 22              | 13.2           |
| AP Exceed                             | ---          | ---         | 28          | 55.9                   | 85                  | 7/7             | 21              | 11.2           |
| UI Magic CL+                          | 55           | 45          | 24          | 55.3                   | 53                  | 7/10            | 19              | 14.4           |
| Stephens                              | 48           | 42          | 24          | 54.7                   | 56                  | 7/10            | 22              | 13.4           |
| TMC M-Pire                            | ---          | ---         | 24          | 54.9                   | 46                  | 7/13            | 20              | 13.4           |
| WB 456                                | 46           | 48          | 23          | 56.9                   | 69                  | 7/9             | 19              | 14.2           |
| IDO1708                               | 66           | 53          | 19          | 53.6                   | 48                  | 7/9             | 20              | 13.1           |
| AP Iliad                              | 77           | 52          | 18          | 53.9                   | 28                  | 7/11            | 20              | 14.5           |
| WB1621                                | ---          | 51          | 17          | 57.8                   | 60                  | 7/7             | 20              | 12.0           |
| WB1376CLP                             | 60           | 45          | 15          | 57.2                   | 61                  | 7/12            | 20              | 13.7           |
| SY Assure                             | 58           | 46          | 12          | 56.4                   | 16                  | 7/8             | 19              | 14.6           |
| VI Voodoo CL+                         | 56           | 36          | 11          | 51.5                   | 9                   | 7/12            | 17              | 13.4           |
| Appleby CL+                           | 58           | 44          | 10          | 52.7                   | 10                  | 7/9             | 19              | 14.5           |
| ORI2190027CL+                         | ---          | 48          | 7           | 52.5                   | 5                   | ---             | 19              | 13.7           |
| <b>Average</b>                        | <b>58</b>    | <b>48</b>   | <b>28</b>   | <b>55.1</b>            | <b>60</b>           | <b>7/10</b>     | <b>21</b>       | <b>13.4</b>    |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>16</b>    | <b>12</b>   | <b>11</b>   | <b>2</b>               | <b>28</b>           | <b>3</b>        | <b>2</b>        | <b>---</b>     |
| <b>CV (%)</b>                         | <b>17.8</b>  | <b>17.3</b> | <b>27.0</b> | <b>2.6</b>             | <b>33.9</b>         | <b>1.0</b>      | <b>6.9</b>      | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Test weight data was obtained from the harvestmaster.

No lodging to report.

Table 23. Soft White Winter Wheat Yield Percentage of Location Averages, 2022-23.

| Variety or Selection           | (100% = Average) |            |           |                 |              | Variety    |
|--------------------------------|------------------|------------|-----------|-----------------|--------------|------------|
|                                | Aberdeen         | Kimberly   | Ririe Dry | Ririe Irrigated | Soda Springs | Average    |
| WA8415                         | 106              | 110        | ---       | 102             | 155          | <b>118</b> |
| Sockeye CL+                    | 109              | 119        | 111       | 100             | 136          | <b>115</b> |
| LCS Hulk                       | 114              | 119        | 111       | 112             | 116          | <b>114</b> |
| Otto                           | ---              | ---        | 112       | ---             | 116          | <b>114</b> |
| Piranha CL+                    | 101              | 111        | 107       | 107             | 141          | <b>114</b> |
| UIL15-028024                   | 111              | 111        | 98        | 101             | 146          | <b>113</b> |
| Eltan                          | ---              | ---        | 106       | ---             | 119          | <b>112</b> |
| Norwest Tandem                 | 105              | 104        | 102       | 103             | 147          | <b>112</b> |
| Eltan 11-52-0                  | ---              | ---        | 108       | ---             | 114          | <b>111</b> |
| AP Exceed                      | 111              | 115        | 107       | 119             | 95           | <b>109</b> |
| SY Ovation                     | 111              | 124        | 97        | 109             | 107          | <b>109</b> |
| UIL13-046145A                  | 108              | 107        | 105       | 104             | 119          | <b>109</b> |
| UIL17-995133B                  | 108              | 111        | 98        | 108             | 116          | <b>108</b> |
| UIL14-211120A                  | 114              | 106        | 97        | 91              | 133          | <b>108</b> |
| WA8334                         | ---              | ---        | 97        | ---             | 117          | <b>107</b> |
| UIL16-478001                   | ---              | ---        | 117       | ---             | 96           | <b>107</b> |
| WB1783                         | 102              | 110        | 103       | 110             | 100          | <b>105</b> |
| Nimbus (OR2130755)             | 102              | 104        | 108       | 99              | 108          | <b>104</b> |
| Devote                         | ---              | ---        | 109       | ---             | 97           | <b>103</b> |
| Norwest Duet                   | ---              | ---        | 93        | ---             | 111          | <b>102</b> |
| VI Shock                       | 110              | 98         | ---       | 96              | ---          | <b>102</b> |
| WB1529                         | 106              | 100        | ---       | 98              | ---          | <b>101</b> |
| UI Sparrow                     | 95               | 102        | 98        | 84              | 125          | <b>101</b> |
| LCS Blackjack                  | 104              | 101        | ---       | 94              | ---          | <b>100</b> |
| TMC M-Pire                     | 107              | 105        | 107       | 94              | 81           | <b>99</b>  |
| VI Presto CL+                  | 105              | 93         | 92        | 96              | 106          | <b>98</b>  |
| UIL17-7706 (CL+)               | ---              | ---        | 94        | ---             | 100          | <b>97</b>  |
| WB1621                         | 111              | 106        | 95        | 114             | 57           | <b>97</b>  |
| Stingray CL+                   | 97               | 107        | ---       | 85              | ---          | <b>96</b>  |
| OR2160264                      | 104              | 89         | ---       | 94              | ---          | <b>96</b>  |
| OR2160243                      | 95               | 78         | ---       | 111             | ---          | <b>95</b>  |
| IDO1708                        | 99               | 96         | 94        | 110             | 66           | <b>93</b>  |
| Stephens                       | 103              | 97         | 81        | 98              | 81           | <b>92</b>  |
| WB 456                         | 90               | 96         | 104       | 91              | 78           | <b>91</b>  |
| UI Magic CL+                   | 94               | 80         | 99        | 99              | 82           | <b>91</b>  |
| OR2170559                      | 81               | 75         | ---       | 110             | ---          | <b>88</b>  |
| AP Iliad                       | 88               | 111        | 91        | 90              | 61           | <b>88</b>  |
| WB1376CLP                      | 92               | 91         | 104       | 87              | 53           | <b>85</b>  |
| SY Assure                      | 82               | 93         | 100       | 96              | 41           | <b>82</b>  |
| VI Voodoo CL+                  | 61               | 72         | 94        | 103             | 39           | <b>74</b>  |
| ORI2190027CL+                  | 74               | 61         | 87        | 86              | 22           | <b>66</b>  |
| Appleby CL+                    | ---              | ---        | 81        | ---             | 35           | <b>58</b>  |
| <b>Location Average (bu/A)</b> | <b>144</b>       | <b>136</b> | <b>35</b> | <b>117</b>      | <b>28</b>    |            |

Chart 3. 2023 Soft Winter Wheat Yield Percentage Across All Locations  
(Average=100%)

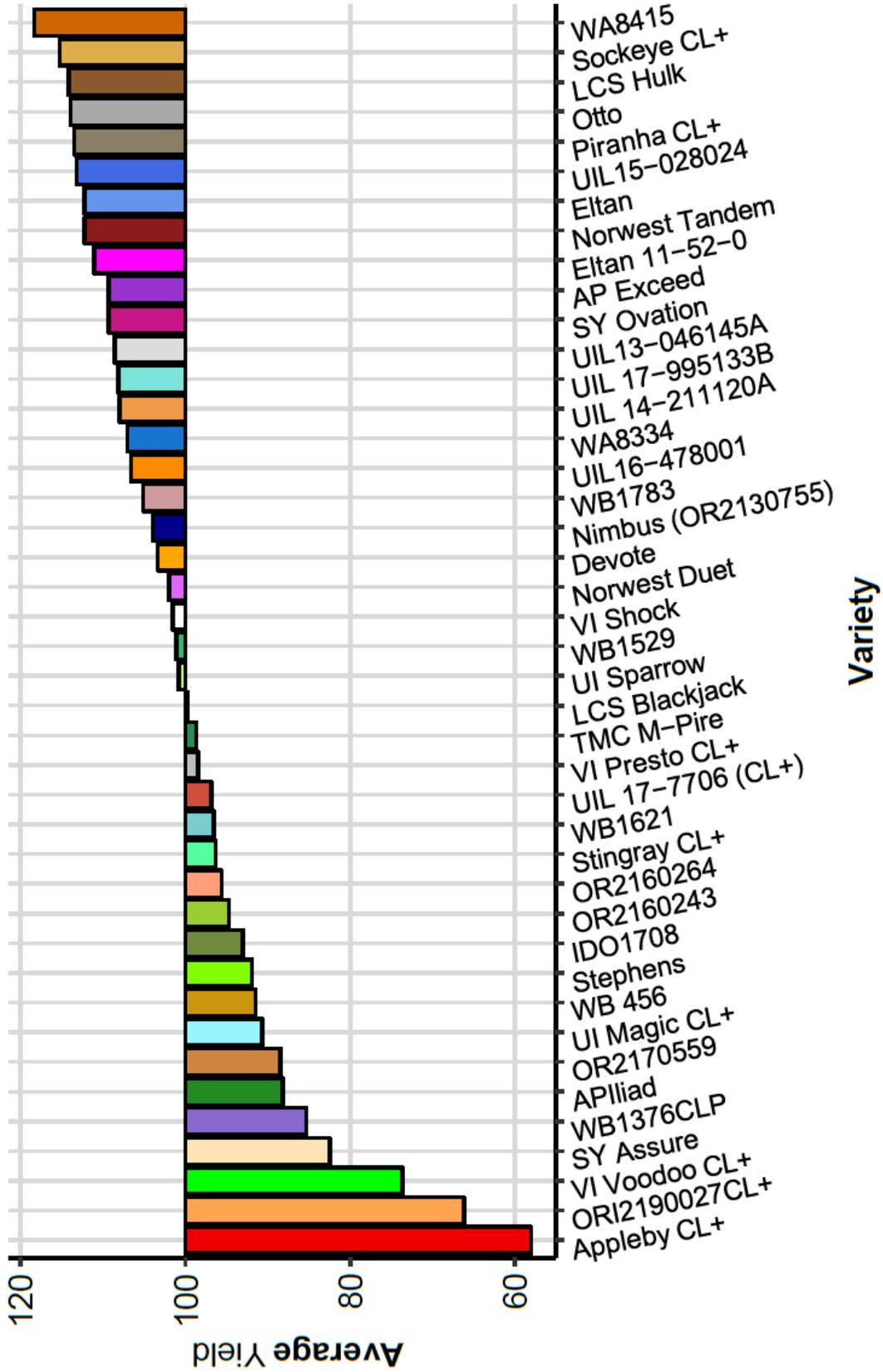


Table 24. Winter Barley Irrigated Nurseries, 3-Year Averages (2021-2023; 5 site-years\*).

| Variety or Selection                 | Yield<br>(bu/A)** | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plumps      |             |             |
|--------------------------------------|-------------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|-------------|-------------|-------------|
|                                      |                   |                     |                     |                 |                 |                |                | (>6/64)     | (>5.5/64)   | % thin      |
| <b>Thunder</b>                       | <b>153</b>        | 47                  | 92                  | 5/30            | 37              | 38             | 12.3           | 94.8        | 3.4         | 2.0         |
| <b>KWS Donau</b>                     | <b>150</b>        | 50                  | 96                  | 5/31            | 41              | 8              | 12.0           | 96.7        | 2.1         | 1.5         |
| <b>Flavia</b>                        | <b>150</b>        | 50                  | 92                  | 5/29            | 41 36           | 5              | 12.7           | 94.9        | 3.7         | 1.6         |
| <b>LCS Calypso</b>                   | <b>148</b>        | 50                  | 94                  | 5/30            |                 | 20             | 12.7           | 93.8        | 4.3         | 2.2         |
| <b>WintMalt</b>                      | <b>143</b>        | 49                  | 93                  | 6/3             | 39              | 17             | 11.5           | 92.4        | 5.4         | 2.3         |
| Lightning                            | 139               | 51                  | 91                  | 5/30            | 40              | 11             | 12.4           | 96.0        | 2.6         | 1.7         |
| Hirondella                           | 139               | 47                  | 87                  | 5/31            | 38              | 11             | 11.8           | 90.0        | 6.9         | 3.3         |
| Sunstar Pride                        | 136               | 45                  | 86                  | 6/10            | 36              | 22             | 10.7           | 41.7        | 23.5        | 35.0        |
| Eight-Twelve                         | 136               | 47                  | 91                  | 6/1             | 39              | 33             | 12.0           | 56.3        | 24.0        | 20.1        |
| Charles                              | 128               | 48                  | 87                  | 5/31            | 39              | 59             | 12.8           | 88.2        | 7.5         | 4.5         |
| Endeavor                             | 123               | 50                  | 84                  | 6/1             | 40              | 42             | 13.1           | 76.8        | 13.9        | 9.7         |
| Upspring                             | 108               | 59                  | 73                  | 5/10            | 38              | 9              | 13.0           | 69.3        | 22.2        | 8.5         |
| 13ARS537-19                          | 104               | 51                  | 63                  | 5/5             | 32              | 47             | 11.9           | 93.6        | 3.5         | 2.8         |
| <b>Average</b>                       | <b>137</b>        | <b>49</b>           | <b>88</b>           | <b>5/29</b>     | <b>39</b>       | <b>24</b>      | <b>12.1</b>    | <b>83.6</b> | <b>9.2</b>  | <b>7.3</b>  |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>13</b>         | <b>3</b>            | <b>6</b>            | <b>7</b>        | <b>3</b>        | <b>16</b>      | <b>1</b>       | <b>7</b>    | <b>4</b>    | <b>6</b>    |
| <b>CV (%)</b>                        | <b>13.9</b>       | <b>9.0</b>          | <b>10.8</b>         | <b>6.7</b>      | <b>9.8</b>      | <b>97.9</b>    | <b>6.5</b>     | <b>6.6</b>  | <b>32.7</b> | <b>63.5</b> |

\* The 2023 winter plots in Rupert were significantly damaged by winter conditions, hence agronomic data for that specific year and location was not included (only 5 site-years were used for the analyses).

\*\* Varieties or selections in bold are not statistically different from the top yielding variety.

Table 25. Agronomic Data for Winter Barley at Aberdeen, Irrigated, 2022-23.

| Variety or Selection                 | Yield (bu/A) |            |              | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Height<br>(in.) | Heading<br>Date | Protein<br>(%) | (>6/64)     | Plump<br>(>5.5/64) | % Thin     |
|--------------------------------------|--------------|------------|--------------|---------------------|---------------------|-----------------|-----------------|----------------|-------------|--------------------|------------|
|                                      | 2021         | 2022       | 2023*        |                     |                     |                 |                 |                |             |                    |            |
| UTWB11135-1                          | ---          | ---        | <b>116</b>   | 44.7                | 73                  | 43              | 6/7             | 13.0           | 83.4        | 11.5               | 5.4        |
| BC Clementine                        | ---          | 225        | <b>114</b>   | 49.0                | 75                  | 45              | 6/5             | 16.2           | 94.0        | 3.9                | 1.7        |
| UTWB10201                            | ---          | ---        | <b>112</b>   | 44.5                | 70                  | 41              | 6/8             | 12.3           | 80.5        | 13.1               | 6.8        |
| BC Fay                               | ---          | 214        | <b>105</b>   | 48.0                | 75                  | 43              | 6/6             | 15.4           | 93.9        | 3.7                | 2.4        |
| DH170472                             | ---          | 199        | <b>104</b>   | 48.4                | 78                  | 46              | 6/8             | 16.5           | 97.4        | 1.5                | 1.1        |
| DH150683                             | ---          | 178        | <b>93</b>    | 46.6                | 63                  | 44              | 6/8             | 16.6           | 94.7        | 3.2                | 2.1        |
| 12ARS578-3                           | ---          | ---        | <b>89</b>    | 49.2                | 64                  | 42              | 6/9             | 15.7           | 92.9        | 4.5                | 2.5        |
| KWS Donau                            | 122          | <b>195</b> | <b>89</b>    | 48.6                | 85                  | 34              | 6/8             | 13.0           | 98.1        | 1.4                | 0.9        |
| Eight-Twelve                         | 105          | 181        | <b>83</b>    | 44.8                | 60                  | 43              | 6/14            | 12.5           | 63.9        | 22.6               | 13.2       |
| LCS Calypso                          | 124          | 195        | <b>82</b>    | 47.4                | 68                  | 36              | 6/4             | 14.2           | 94.3        | 4.1                | 2.0        |
| 11ARS652-7                           | ---          | ---        | <b>80</b>    | 49.3                | 52                  | 47              | 6/16            | 13.8           | 92.2        | 4.9                | 2.6        |
| Thunder                              | 139          | 194        | <b>80</b>    | 48.7                | 67                  | 45              | 6/10            | 13.8           | 97.6        | 1.6                | 1.2        |
| Scoular Test                         | ---          | ---        | <b>79</b>    | 49.4                | 48                  | 43              | 6/6             | 14.1           | 92.8        | 5.0                | 2.3        |
| Lightning                            | 113          | 173        | <b>74</b>    | 48.7                | 57                  | 45              | 6/7             | 15.5           | 93.3        | 4.5                | 2.7        |
| WintMalt                             | 131          | 183        | <b>72</b>    | 46.8                | 78                  | 44              | 6/18            | 13.7           | 92.3        | 4.9                | 2.6        |
| UTWB10406-9                          | ---          | ---        | <b>64</b>    | 44.4                | 42                  | 36              | 6/10            | 13.1           | 77.6        | 14.3               | 8.2        |
| DH162310                             | ---          | 183        | <b>63</b>    | 47.4                | 48                  | 41              | 6/6             | 16.9           | 95.5        | 2.2                | 2.2        |
| Flavia                               | 128          | 204        | 58           | 47.6                | 65                  | 41              | 6/6             | 14.3           | 95.3        | 2.4                | 2.3        |
| Hirondella                           | 110          | 193        | 56           | 45.4                | 38                  | 44              | 6/8             | 14.3           | 93.7        | 4.1                | 2.3        |
| DH141917                             | ---          | 201        | 50           | 46.9                | 48                  | 41              | 6/11            | 15.5           | 96.1        | 2.2                | 1.8        |
| Marouetta                            | ---          | 148        | 46           | 46.5                | 42                  | 34              | 6/6             | 13.4           | 90.4        | 6.8                | 3.3        |
| Charles                              | 118          | <b>180</b> | 43           | 46.5                | 32                  | 28              | 6/10            | 15.7           | 93.6        | 3.4                | 2.7        |
| Sunstar Pride                        | 138          | 191        | 34           | 42.1                | 25                  | 24              | 6/20            | 13.9           | 44.1        | 29.9               | 26.2       |
| 13ARS537-19                          | 144          | 203        | 30           | 49.6                | 20                  | 29              | 4/14            | 15.9           | 94.3        | 2.4                | 2.8        |
| Avalon                               | ---          | ---        | 22           | 47.6                | 20                  | 24              | 6/6             | 18.7           | 86.4        | 8.0                | 5.3        |
| 12ARS777-1**                         | ---          | 173        | 17           | 53.5                | 25                  | 21              | 6/11            | 16.3           | 71.1        | 19.5               | 8.9        |
| Endeavor                             | 112          | 176        | 8            | 46.1                | 7                   | 10              | 6/7             | 17.3           | 76.6        | 14.5               | 8.8        |
| 12ARS777-2**                         | ---          | 179        | 7            | 47.1                | 15                  | 9               | 4/20            | 18.5           | 56.5        | 23.1               | 19.8       |
| Upspring                             | 97           | 152        | 2            | ---                 | 1                   | 1               | 1/0             | .              | .           | .                  | .          |
| <b>Average</b>                       | <b>119</b>   | <b>189</b> | <b>68***</b> | <b>47.2</b>         | <b>50</b>           | <b>36</b>       | <b>5/31</b>     | <b>15.0</b>    | <b>86.9</b> | <b>8.0</b>         | <b>5.1</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>17</b>    | <b>19</b>  | <b>56</b>    | <b>3</b>            | <b>45</b>           | <b>17</b>       | <b>39</b>       | <b>--</b>      | <b>--</b>   | <b>--</b>          | <b>--</b>  |
| <b>CV (%)</b>                        | <b>10.3</b>  | <b>7.3</b> | <b>51</b>    | <b>3</b>            | <b>54.7</b>         | <b>29.4</b>     | <b>15.7</b>     | <b>--</b>      | <b>--</b>   | <b>--</b>          | <b>--</b>  |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates hullless variety.

\*\*\*Severe winter killed several reps and reduced stand. Data were analysed from Reps 1-3; rep 4 was discarded before analysis.

No lodging to report.

Table 26. Hard Spring Wheat Irrigated Nurseries, 3 Years Average (2021-2023; 12 site-years).

| Variety or Selection                  | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in) | Lodging<br>(%) | Protein<br>(%) |
|---------------------------------------|------------------|---------------------|---------------------|-----------------|----------------|----------------|----------------|
| UI Gold (W)                           | <b>122</b>       | 59.3                | 100                 | 6/25            | 35             | 1              | 13.3           |
| Dayn (W)                              | <b>122</b>       | 59.7                | 99                  | 6/22            | 35             | 0              | 13.3           |
| WB9707                                | <b>119</b>       | 61.0                | 99                  | 6/21            | 34             | 1              | 14.1           |
| <b>IDO2105S</b>                       | <b>119</b>       | 60.1                | 100                 | 6/22            | 34             | 1              | 13.1           |
| WA 8356                               | 117              | 60.0                | 100                 | 6/21            | 35             | 0              | 13.3           |
| WB7313 (W)                            | 116              | 59.3                | 100                 | 6/20            | 31             | 4              | 13.6           |
| WB7696 (W)                            | 114              | 59.1                | 99                  | 6/22            | 31             | 0              | 13.2           |
| Jefferson HF                          | 113              | 60.3                | 100                 | 6/22            | 35             | 7              | 13.4           |
| SY-Teton (W)                          | 113              | 57.9                | 100                 | 6/22            | 32             | 2              | 13.1           |
| Holmes                                | 112              | 60.7                | 100                 | 6/21            | 33             | 1              | 14.0           |
| MT2063                                | 110              | 59.5                | 100                 | 6/23            | 35             | 11             | 13.5           |
| SY Gunsight                           | 110              | 57.9                | 100                 | 6/24            | 32             | 3              | 13.2           |
| Espresso                              | 109              | 59.4                | 100                 | 6/25            | 34             | 0              | 14.3           |
| IDO2002 (W)                           | 109              | 58.7                | 100                 | 6/23            | 31             | 0              | 13.2           |
| WB9724CLP                             | 109              | 59.7                | 99                  | 6/24            | 35             | 4              | 10.3           |
| Dagmar                                | 108              | 60.0                | 99                  | 6/21            | 36             | 11             | 14.7           |
| Alum                                  | 108              | 60.4                | 100                 | 6/24            | 36             | 4              | 14.7           |
| WA 8330 (W)                           | 108              | 59.4                | 100                 | 6/21            | 34             | 9              | 14.2           |
| WB7589 (W)                            | 108              | 58.9                | 99                  | 6/23            | 28             | 0              | 13.8           |
| UI Platinum (W)                       | 108              | 58.8                | 100                 | 6/20            | 31             | 1              | 12.9           |
| Glee                                  | 105              | 59.4                | 100                 | 6/22            | 34             | 9              | 13.5           |
| Net CL+                               | 104              | 60.7                | 100                 | 6/26            | 35             | 6              | 13.8           |
| WB9668                                | 104              | 59.5                | 100                 | 6/22            | 30             | 1              | 14.6           |
| WA 8357                               | 103              | 61.7                | 99                  | 6/22            | 41             | 12             | 14.8           |
| <b>Average</b>                        | <b>111</b>       | <b>59.6</b>         | <b>100</b>          | <b>6/23</b>     | <b>34</b>      | <b>4</b>       | <b>13.6</b>    |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>4</b>         | <b>0.3</b>          | <b>1</b>            | <b>0.4</b>      | <b>1</b>       | <b>4</b>       | <b>0.5</b>     |
| <b>CV (%)</b>                         | <b>9.1</b>       | <b>1.2</b>          | <b>2.0</b>          | <b>0.6</b>      | <b>6.2</b>     | <b>297.0</b>   | <b>4.7</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

Table 27. Hard Spring Wheat Dryland Nurseries, 3 Years Average (2021-2023; 3 site-years).

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in) | Protein<br>(%) |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|----------------|----------------|
| <b>Dayn (W)</b>                      | <b>36</b>        | 60.7                | 98                  | 7/7             | 27             | 13.2           |
| <b>Alum</b>                          | <b>35</b>        | 61.3                | 100                 | 7/10            | 27             | 11.6           |
| <b>Net CL+</b>                       | <b>34</b>        | 62.0                | 100                 | 7/11            | 27             | 13.5           |
| <b>SY-Teton (W)</b>                  | <b>33</b>        | 58.3                | 99                  | 7/9             | 24             | 13.5           |
| <b>IDO2105S</b>                      | <b>33</b>        | 60.9                | 100                 | 7/6             | 25             | 13.5           |
| Duclair                              | 32               | 60.1                | 100                 | 7/8             | 26             | 12.8           |
| WA 8356                              | 32               | 59.8                | 100                 | 7/6             | 27             | 13.6           |
| WA 8330 (W)                          | 32               | 60.8                | 99                  | 7/6             | 26             | 12.8           |
| Dagmar                               | 32               | 60.9                | 100                 | 7/8             | 26             | 13.3           |
| Glee                                 | 31               | 61.1                | 100                 | 7/7             | 27             | 13.0           |
| WB7202CLP (W)                        | 31               | 59.4                | 100                 | 7/5             | 24             | 13.0           |
| Jefferson HF                         | 31               | 54.3                | 100                 | 7/7             | 26             | 12.8           |
| Rocker                               | 30               | 61.6                | 100                 | 7/11            | 26             | 13.0           |
| MT2063                               | 30               | 60.7                | 100                 | 7/8             | 25             | 13.4           |
| Choteau                              | 30               | 60.3                | 100                 | 7/9             | 25             | 13.9           |
| WB9879CLP                            | 30               | 60.2                | 100                 | 7/11            | 24             | 13.9           |
| WA 8357                              | 29               | 61.8                | 100                 | 7/8             | 29             | 13.5           |
| IDO2002 (W)                          | 29               | 60.6                | 100                 | 7/7             | 24             | 13.1           |
| UI Platinum (W)                      | 29               | 59.8                | 99                  | 7/5             | 24             | 13.9           |
| Espresso                             | 26               | 59.8                | 99                  | 7/12            | 24             | 13.0           |
| <b>Average</b>                       | <b>31</b>        | <b>60.0</b>         | <b>100</b>          | <b>7/8</b>      | <b>26</b>      | <b>12.9</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>3</b>         | <b>4</b>            | <b>1</b>            | <b>1</b>        | <b>1</b>       | <b>1</b>       |
| <b>CV (%)</b>                        | <b>13.0</b>      | <b>8.7</b>          | <b>1.7</b>          | <b>0.5</b>      | <b>5.4</b>     | <b>5.6</b>     |

\* Variety or selection in bold are not statistically different from the top yielding variety.

(W) = White

No lodging to report.

Table 28. Irrigated Hard Spring Wheat Data Combined from Rupert, Idaho Falls, Teton and Aberdeen, 2023.

| Variety or Selection                  | Yield (bu/A)* | Test Wt. (lb/bu) | Spring Stand (%) | Heading Date | Height (in) | Lodging (%)  | Protein (%) |
|---------------------------------------|---------------|------------------|------------------|--------------|-------------|--------------|-------------|
| <b>WB9707</b>                         | <b>135</b>    | 61.5             | 100              | 6/23         | 36          | 1            | 14.0        |
| <b>Dayn (W)</b>                       | <b>134</b>    | 59.9             | 100              | 6/23         | 36          | 0            | 12.9        |
| <b>UI Gold (W)</b>                    | <b>130</b>    | 59.5             | 99               | 6/26         | 36          | 0            | 13.0        |
| <b>AP Venom</b>                       | <b>127</b>    | 57.3             | 99               | 6/28         | 39          | 0            | 12.2        |
| <b>Jefferson HF</b>                   | <b>127</b>    | 60.6             | 99               | 6/23         | 35          | 0            | 12.6        |
| WA 8373                               | 126           | 60.2             | 99               | 6/22         | 35          | 0            | 12.7        |
| SY-Teton (W)                          | 125           | 58.5             | 99               | 6/25         | 34          | 0            | 12.6        |
| WA 8356                               | 124           | 60.1             | 100              | 6/23         | 36          | 0            | 12.4        |
| IDO2105S                              | 124           | 60.5             | 100              | 6/24         | 35          | 1            | 12.6        |
| WA 8342W                              | 124           | 60.1             | 99               | 6/23         | 35          | 0            | 12.7        |
| LCS Hammer AX                         | 123           | 60.2             | 98               | 6/26         | 36          | 0            | 13.1        |
| MT2030                                | 123           | 59.7             | 99               | 6/25         | 37          | 3            | 14.2        |
| WA 8372 (W)                           | 122           | 60.8             | 98               | 6/24         | 33          | 0            | 13.0        |
| WA 8374 (W)                           | 122           | 59.8             | 99               | 6/25         | 35          | 0            | 13.0        |
| MT2063                                | 122           | 60.0             | 99               | 6/25         | 36          | 4            | 12.5        |
| WB7313 (W)                            | 120           | 58.8             | 100              | 6/21         | 32          | 0            | 13.1        |
| IDO2202CL2                            | 119           | 60.3             | 99               | 6/24         | 36          | 0            | 12.5        |
| WB7696 (W)                            | 119           | 59.1             | 99               | 6/25         | 33          | 0            | 13.1        |
| MT1939                                | 119           | 59.4             | 100              | 6/25         | 36          | 0            | 13.6        |
| IDO2104HF                             | 118           | 59.5             | 100              | 6/25         | 36          | 0            | 12.7        |
| WA8342R                               | 118           | 60.2             | 99               | 6/27         | 33          | 0            | 12.5        |
| Alum                                  | 117           | 60.7             | 99               | 6/27         | 38          | 0            | 13.6        |
| MT1809                                | 116           | 58.6             | 99               | 6/26         | 37          | 5            | 14.0        |
| Dagmar                                | 116           | 60.5             | 99               | 6/23         | 37          | 6            | 14.2        |
| WB7589 (W)                            | 116           | 59.4             | 99               | 6/26         | 30          | 0            | 13.4        |
| Hale                                  | 116           | 60.2             | 100              | 6/24         | 37          | 2            | 13.2        |
| Expresso                              | 115           | 59.2             | 99               | 6/28         | 36          | 0            | 13.9        |
| WB9724CLP                             | 115           | 60.8             | 99               | 6/24         | 33          | 0            | 13.9        |
| Holmes                                | 115           | 61.2             | 100              | 6/23         | 34          | 2            | 13.8        |
| WA 8330 (W)                           | 115           | 59.7             | 99               | 6/22         | 35          | 2            | 13.8        |
| WA 8359                               | 114           | 58.4             | 98               | 6/26         | 34          | 0            | 13.2        |
| Net CL+                               | 113           | 60.6             | 100              | 6/27         | 36          | 1            | 13.5        |
| WB9668                                | 112           | 59.6             | 99               | 6/23         | 32          | 0            | 14.3        |
| UI Platinum (W)                       | 112           | 58.7             | 100              | 6/22         | 32          | 3            | 12.5        |
| IDO2002 (W)                           | 111           | 58.4             | 99               | 6/25         | 32          | 0            | 12.8        |
| WA 8357                               | 111           | 61.9             | 99               | 6/24         | 44          | 0            | 14.2        |
| SY Gunsight                           | 110           | 58.2             | 100              | 6/25         | 33          | 0            | 12.7        |
| Glee                                  | 110           | 59.8             | 100              | 6/24         | 35          | 5            | 13.0        |
| <b>Average</b>                        | <b>119</b>    | <b>59.7</b>      | <b>99</b>        | <b>6/25</b>  | <b>35</b>   | <b>1</b>     | <b>13.1</b> |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>7</b>      | <b>0.4</b>       | <b>1</b>         | <b>1</b>     | <b>1</b>    | <b>4</b>     | <b>1</b>    |
| <b>CV (%)</b>                         | <b>8.8</b>    | <b>1.3</b>       | <b>1.7</b>       | <b>0.6</b>   | <b>5.3</b>  | <b>623.0</b> | <b>3.8</b>  |

\* Variety or selection in bold are not statistically different from the top yielding variety.  
(W) = White

Table 29. Agronomic Data for Hard Spring Wheat at Rupert, Irrigated, 2023.

| Variety or Selection                 | Yield (bu/A) |            |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in) | Protein<br>(%) |
|--------------------------------------|--------------|------------|------------|---------------------|---------------------|-----------------|----------------|----------------|
|                                      | 2021         | 2022       | 2023*      |                     |                     |                 |                |                |
| UI Gold (W)                          | 128          | 113        | <b>133</b> | 58.1                | 100                 | 6/17            | 37             | 12.7           |
| LCS Hammer AX                        | ---          | ---        | <b>132</b> | 58.2                | 100                 | 6/17            | 37             | 13.2           |
| WB9707                               | 120          | 109        | <b>132</b> | 59.7                | 100                 | 6/14            | 35             | 13.8           |
| Dayn (W)                             | 113          | 120        | <b>129</b> | 58.2                | 100                 | 6/14            | 36             | 13.0           |
| MT2030                               | ---          | ---        | <b>129</b> | 58.3                | 100                 | 6/17            | 37             | 14.3           |
| MT1809                               | ---          | ---        | <b>127</b> | 56.8                | 100                 | 6/18            | 37             | 14.3           |
| Jefferson HF                         | 109          | 102        | <b>126</b> | 59.2                | 100                 | 6/13            | 36             | 12.8           |
| MT1939                               | ---          | ---        | <b>126</b> | 58.1                | 100                 | 6/17            | 38             | 13.4           |
| WA 8373                              | ---          | ---        | <b>126</b> | 58.7                | 100                 | 6/13            | 35             | 12.8           |
| IDO2105S                             | 119          | 112        | 123        | 58.7                | 100                 | 6/13            | 34             | 13.1           |
| Holmes                               | 120          | 113        | 123        | 60.0                | 100                 | 6/13            | 36             | 14.3           |
| WA 8342W                             | ---          | 110        | 123        | 58.7                | 100                 | 6/16            | 36             | 12.8           |
| Dagmar                               | 117          | 95         | 123        | 58.8                | 100                 | 6/13            | 38             | 14.1           |
| AP Venom                             | ---          | ---        | 122        | 56.7                | 100                 | 6/27            | 37             | 12.6           |
| WA 8356                              | 114          | 111        | 121        | 58.8                | 100                 | 6/14            | 36             | 13.0           |
| MT2063                               | 107          | 94         | 120        | 57.9                | 100                 | 6/16            | 36             | 13.0           |
| WB7313 (W)                           | 125          | 119        | 120        | 57.5                | 100                 | 6/11            | 34             | 13.9           |
| WB7696 (W)                           | 109          | 113        | 119        | 57.2                | 100                 | 6/17            | 32             | 13.0           |
| Espresso                             | 105          | 110        | 118        | 58.0                | 100                 | 6/20            | 38             | 14.0           |
| WA8342R                              | ---          | ---        | 117        | 58.2                | 100                 | 6/17            | 33             | 12.7           |
| WB7589 (W)                           | 91           | 102        | 117        | 57.6                | 100                 | 6/17            | 30             | 14.4           |
| Hale                                 | ---          | ---        | 116        | 58.2                | 100                 | 6/16            | 38             | 14.2           |
| WB9724CLP                            | ---          | 104        | 116        | 59.3                | 99                  | 6/16            | 33             | 14.4           |
| IDO2202CL2                           | ---          | 105        | 115        | 58.9                | 99                  | 6/16            | 37             | 12.9           |
| SY-Teton (W)                         | 116          | 97         | 115        | 56.3                | 100                 | 6/16            | 34             | 13.1           |
| WA 8372 (W)                          | ---          | 93         | 114        | 58.9                | 100                 | 6/15            | 32             | 13.0           |
| IDO2104HF                            | ---          | 125        | 113        | 57.7                | 100                 | 6/16            | 38             | 13.3           |
| WA 8374 (W)                          | ---          | 98         | 113        | 58.4                | 100                 | 6/15            | 35             | 13.4           |
| WA 8330 (W)                          | 109          | 104        | 113        | 57.5                | 100                 | 6/14            | 35             | 14.3           |
| WB9668                               | 98           | 99         | 110        | 57.6                | 100                 | 6/14            | 33             | 14.6           |
| WA 8357                              | 102          | 86         | 109        | 60.5                | 100                 | 6/16            | 45             | 14.6           |
| Net CL+                              | 99           | 94         | 108        | 58.9                | 100                 | 6/20            | 38             | 14.0           |
| Alum                                 | 110          | 96         | 106        | 58.3                | 100                 | 6/18            | 38             | 14.3           |
| SY Gunsight                          | 99           | 112        | 106        | 55.1                | 100                 | 6/17            | 33             | 13.5           |
| Glee                                 | 101          | 106        | 105        | 57.4                | 100                 | 6/14            | 36             | 13.9           |
| IDO2002 (W)                          | 108          | 97         | 103        | 55.7                | 100                 | 6/17            | 32             | 13.7           |
| UI Platinum (W)                      | 106          | 82         | 98         | 56.2                | 100                 | 6/11            | 32             | 13.6           |
| WA 8359                              | ---          | 101        | 92         | 54.7                | 100                 | 6/17            | 34             | 13.8           |
| <b>Average</b>                       | <b>109</b>   | <b>104</b> | <b>117</b> | <b>58.0</b>         | <b>100</b>          | <b>6/16</b>     | <b>35</b>      | <b>13.6</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>14</b>    | <b>14</b>  | <b>9</b>   | <b>1</b>            | <b>1</b>            | <b>2</b>        | <b>2</b>       | ---            |
| <b>CV (%)</b>                        | <b>9.0</b>   | <b>9.8</b> | <b>5.5</b> | <b>1.2</b>          | <b>0.5</b>          | <b>0.7</b>      | <b>4.8</b>     | ---            |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

No lodging to report.

Table 30. Agronomic Data for Hard Spring Wheat at Aberdeen, Irrigated, 2023.

| Variety or Selection                 | Yield (bu/A) |            |            | Test Wt. (lb/bu) | Spring Stand (%) | Heading Date | Height (in.) | Lodging (%)  | Protein (%) |
|--------------------------------------|--------------|------------|------------|------------------|------------------|--------------|--------------|--------------|-------------|
|                                      | 2021         | 2022       | 2023*      |                  |                  |              |              |              |             |
| Dayn (W)                             | 121          | 126        | <b>153</b> | 59.2             | 98               | 6/16         | 39           | 0            | 13.3        |
| UI Gold (W)                          | 113          | 131        | <b>142</b> | 58.4             | 97               | 6/18         | 39           | 0            | 13.8        |
| WA 8372 (W)                          | ---          | 122        | <b>139</b> | 59.6             | 94               | 6/18         | 35           | 0            | 13.5        |
| IDO2105S                             | 98           | 128        | <b>137</b> | 59.2             | 98               | 6/19         | 39           | 0            | 13.5        |
| Jefferson HF                         | 109          | 119        | <b>137</b> | 59.7             | 97               | 6/15         | 37           | 0            | 12.5        |
| WA 8356                              | 114          | 128        | <b>137</b> | 58.8             | 99               | 6/15         | 36           | 0            | 13.2        |
| WB9707                               | 118          | 123        | 134        | 60.4             | 100              | 6/14         | 36           | 0            | 14.3        |
| SY-Teton (W)                         | 114          | 116        | 133        | 57.7             | 96               | 6/18         | 35           | 0            | 13.4        |
| AP Venom                             | ---          | ---        | 133        | 57.2             | 97               | 6/26         | 40           | 0            | 13.0        |
| MT1939                               | ---          | ---        | 132        | 58.2             | 99               | 6/17         | 37           | 1            | 14.6        |
| WA 8374 (W)                          | ---          | 110        | 132        | 58.3             | 95               | 6/17         | 34           | 0            | 13.7        |
| UI Platinum (W)                      | 106          | 120        | 132        | 58.0             | 100              | 6/15         | 33           | 0            | 12.6        |
| MT2063                               | 113          | 112        | 131        | 58.7             | 96               | 6/18         | 38           | 14           | 13.5        |
| WA 8373                              | ---          | ---        | 131        | 58.8             | 98               | 6/13         | 36           | 0            | 13.2        |
| WA 8342W                             | ---          | 134        | 130        | 58.2             | 97               | 6/15         | 36           | 0            | 13.7        |
| MT2030                               | ---          | ---        | 130        | 58.2             | 98               | 6/14         | 38           | 13           | 15.4        |
| Alum                                 | 101          | 103        | 130        | 60.4             | 97               | 6/20         | 40           | 0            | 14.6        |
| WA8342R                              | ---          | ---        | 129        | 58.3             | 96               | 6/20         | 35           | 0            | 13.0        |
| Hale                                 | ---          | ---        | 128        | 59.0             | 98               | 6/15         | 38           | 9            | 13.8        |
| IDO2104HF                            | ---          | 121        | 127        | 58.7             | 99               | 6/17         | 36           | 0            | 13.1        |
| Rocker                               | ---          | ---        | 126        | 60.1             | 91               | 6/21         | 41           | 0            | 15.1        |
| IDO2202CL2                           | ---          | 116        | 126        | 59.4             | 97               | 6/17         | 39           | 0            | 13.6        |
| LCS Hammer AX                        | ---          | ---        | 125        | 58.7             | 93               | 6/18         | 37           | 0            | 14.5        |
| WA 8359                              | ---          | 114        | 124        | 58.0             | 92               | 6/19         | 35           | 0            | 13.1        |
| WB7313 (W)                           | 108          | 118        | 123        | 57.9             | 100              | 6/14         | 31           | 0            | 13.2        |
| SY Gunsight                          | 116          | 121        | 122        | 57.3             | 99               | 6/18         | 35           | 0            | 13.0        |
| Glee                                 | 110          | 117        | 121        | 59.0             | 99               | 6/16         | 36           | 19           | 13.6        |
| Dagmar                               | 110          | 108        | 121        | 59.5             | 96               | 6/16         | 38           | 23           | 15.5        |
| Holmes                               | 118          | 118        | 121        | 59.9             | 98               | 6/15         | 34           | 0            | 14.7        |
| WB7696 (W)                           | 126          | 117        | 120        | 57.3             | 96               | 6/16         | 34           | 0            | 13.4        |
| WA 8357                              | 107          | 108        | 120        | 61.2             | 96               | 6/14         | 46           | 0            | 15.2        |
| Espresso                             | 102          | 113        | 120        | 57.9             | 98               | 6/19         | 36           | 0            | 14.7        |
| Net CL+                              | 100          | 101        | 118        | 59.4             | 99               | 6/17         | 34           | 1            | 14.2        |
| WA 8388CL+                           | ---          | 110        | 118        | 57.0             | 98               | 6/16         | 36           | 1            | 14.2        |
| WB7589 (W)                           | 109          | 110        | 117        | 56.9             | 95               | 6/17         | 30           | 0            | 14.0        |
| MT1809                               | ---          | ---        | 117        | 56.6             | 97               | 6/19         | 40           | 18           | 15.1        |
| IDO2002 (W)                          | 110          | 119        | 116        | 56.8             | 98               | 6/17         | 33           | 0            | 13.3        |
| WA 8330 (W)                          | 105          | 119        | 114        | 57.9             | 98               | 6/13         | 37           | 8            | 14.6        |
| WB9724CLP                            | ---          | 114        | 111        | 59.6             | 97               | 6/14         | 34           | 0            | 14.3        |
| WB9668                               | 106          | 103        | 111        | 57.5             | 97               | 6/14         | 32           | 0            | 15.1        |
| <b>Average</b>                       | <b>109</b>   | <b>117</b> | <b>127</b> | <b>58.5</b>      | <b>97</b>        | <b>6/17</b>  | <b>36</b>    | <b>3</b>     | <b>13.9</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>18</b>    | <b>10</b>  | <b>16</b>  | <b>1.0</b>       | <b>5</b>         | <b>2</b>     | <b>3</b>     | <b>14</b>    | <b>---</b>  |
| <b>CV (%)</b>                        | <b>11.1</b>  | <b>6.4</b> | <b>8.8</b> | <b>1.3</b>       | <b>3.6</b>       | <b>0.8</b>   | <b>5.9</b>   | <b>381.6</b> | <b>---</b>  |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

Table 31. Agronomic Data for Hard Spring Wheat, Idaho Falls, Irrigated, 2023.

| Variety or Selection                 | Yield (bu/A) |            |            | Test Wt.<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|--------------|------------|------------|---------------------|-----------------|-----------------|----------------|----------------|
|                                      | 2021         | 2022       | 2023*      |                     |                 |                 |                |                |
| Dayn (W)                             | ---          | 122        | <b>142</b> | 59.9                | 6/21            | 35              | 0              | 12.8           |
| WA 8373                              | 115          | 109        | <b>135</b> | 60.2                | 6/20            | 33              | 0              | 12.9           |
| MT2063                               | ---          | 114        | <b>134</b> | 60.3                | 6/24            | 35              | 1              | 12.3           |
| WB9707                               | 116          | 97         | <b>134</b> | 61.8                | 5/17            | 25              | 0              | 13.2           |
| LCS Hammer AX                        | 113          | 116        | <b>133</b> | 60.9                | 6/24            | 36              | 1              | 13.5           |
| WA 8342W                             | 127          | 111        | <b>133</b> | 60.6                | 6/21            | 35              | 0              | 12.6           |
| IDO2202CL2                           | 123          | 118        | <b>133</b> | 59.4                | 6/19            | 32              | 0              | 13.9           |
| WB7313 (W)                           | 116          | 104        | <b>133</b> | 60.6                | 6/22            | 36              | 0              | 12.5           |
| Jefferson HF                         | 118          | 116        | <b>132</b> | 60.6                | 6/22            | 33              | 0              | 12.9           |
| IDO2105S                             | 126          | 118        | <b>131</b> | 61.0                | 6/21            | 33              | 3              | 12.6           |
| Dagmar                               | 133          | 124        | <b>130</b> | 60.8                | 6/22            | 37              | 0              | 14.1           |
| UI Gold (W)                          | 123          | 114        | <b>130</b> | 59.9                | 6/25            | 34              | 0              | 13.0           |
| WA 8356                              | 115          | 111        | <b>130</b> | 60.2                | 6/21            | 34              | 0              | 13.0           |
| WB7696 (W)                           | 115          | 101        | <b>129</b> | 59.1                | 6/23            | 32              | 0              | 13.0           |
| WB9724CLP                            | 118          | 89         | 128        | 61.6                | 6/22            | 33              | 0              | 13.8           |
| AP Venom                             | 140          | 125        | 128        | 59.4                | 7/3             | 38              | 0              | 12.1           |
| MT1809                               | 136          | 115        | 125        | 59.1                | 6/25            | 35              | 1              | 14.4           |
| MT2030                               | ---          | 115        | 125        | 59.7                | 6/25            | 37              | 0              | 13.7           |
| SY-Teton (W)                         | ---          | 114        | 124        | 58.2                | 6/23            | 34              | 0              | 12.4           |
| WA 8374 (W)                          | ---          | 109        | 124        | 60.8                | 6/26            | 33              | 0              | 13.3           |
| WA8342R                              | 118          | 105        | 124        | 60.0                | 6/23            | 34              | 0              | 12.7           |
| Hale                                 | 123          | 120        | 123        | 60.8                | 6/23            | 37              | 0              | 13.7           |
| WA 8372 (W)                          | ---          | 110        | 123        | 61.0                | 6/22            | 33              | 0              | 12.9           |
| Espresso                             | 127          | 121        | 123        | 60.8                | 6/27            | 34              | 0              | 13.7           |
| Net CL+                              | 127          | 114        | 123        | 61.4                | 6/27            | 37              | 5              | 13.5           |
| WB7589 (W)                           | 126          | 101        | 123        | 59.2                | 6/25            | 31              | 0              | 13.5           |
| WA 8359                              | ---          | 110        | 122        | 59.2                | 6/25            | 32              | 0              | 13.0           |
| WA 8330 (W)                          | 119          | 112        | 121        | 59.9                | 6/20            | 34              | 0              | 14.4           |
| WB9668                               | 121          | 100        | 120        | 59.9                | 6/22            | 30              | 0              | 14.1           |
| Holmes                               | 123          | 120        | 120        | 61.7                | 6/21            | 34              | 8              | 13.8           |
| IDO2104HF                            | 129          | 119        | 120        | 59.0                | 6/25            | 33              | 0              | 13.1           |
| Glee                                 | 136          | 121        | 119        | 59.9                | 6/22            | 34              | 0              | 13.2           |
| MT1939                               | 125          | 115        | 118        | 62.6                | 6/24            | 42              | 0              | 15.0           |
| WA 8357                              | ---          | 110        | 118        | 59.3                | 6/24            | 36              | 1              | 13.8           |
| Alum                                 | ---          | 128        | 117        | 60.7                | 6/25            | 37              | 0              | 13.2           |
| IDO2002 (W)                          | ---          | 119        | 116        | 58.2                | 6/24            | 30              | 0              | 13.1           |
| UI Platinum (W)                      | 114          | 113        | 113        | 59.0                | 6/19            | 31              | 10             | 12.8           |
| WA 8388CL+                           | ---          | 105        | 112        | 59.0                | 6/23            | 33              | 0              | 14.1           |
| SY Gunsight                          | 122          | 114        | 106        | 58.3                | 6/25            | 32              | 0              | 13.0           |
| <b>Average</b>                       | <b>123</b>   | <b>113</b> | <b>125</b> | <b>60.1</b>         | <b>6/22</b>     | <b>34</b>       | <b>0.72</b>    | <b>13.3</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>12</b>    | <b>10</b>  | <b>13</b>  | <b>0.7</b>          | <b>16</b>       | <b>5</b>        | <b>6</b>       |                |
| <b>CV (%)</b>                        | <b>6.8</b>   | <b>6.9</b> | <b>7.3</b> | <b>0.8</b>          | <b>6.3</b>      | <b>9.5</b>      | <b>564.8</b>   |                |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

\*\*All plots had full stand.

Table 32. Agronomic Data for Hard Spring Wheat at Tetonia, Irrigated, 2023.

| Variety or Selection                 | Yield (bu/A) |            |             | Test Wt. (lb/bu) | Heading Date | Height (in.) | Protein (%) |
|--------------------------------------|--------------|------------|-------------|------------------|--------------|--------------|-------------|
|                                      | 2021*        | 2022       | 2023**      |                  |              |              |             |
| <b>WB9707</b>                        | 70           | 112        | <b>141</b>  | 64.0             | 7/13         | 38           | 14.7        |
| <b>SY-Teton (W)</b>                  | 66           | 107        | <b>127</b>  | 61.7             | 7/14         | 34           | 11.6        |
| <b>AP Venom</b>                      | ---          | ---        | <b>127</b>  | 56.7             | ---          | 0            | 11.2        |
| WA 8359                              | ---          | 105        | 118         | 61.9             | 7/14         | 33           | 12.9        |
| WA 8374 (W)                          | ---          | 112        | 118         | 62.5             | 7/14         | 37           | 12.2        |
| Alum                                 | 76           | 124        | 117         | 63.3             | 7/14         | 38           | 12.2        |
| <b>UI Gold (W)</b>                   | 84           | 130        | 116         | 61.8             | 7/13         | 34           | 12.6        |
| IDO2104HF                            | ---          | 110        | 114         | 62.8             | 7/13         | 35           | 11.3        |
| Jefferson HF                         | 78           | 113        | 114         | 62.8             | 7/11         | 34           | 12.3        |
| Dayn (W)                             | 91           | 121        | 111         | 62.4             | 7/11         | 35           | 12.6        |
| WA 8372 (W)                          | ---          | 129        | 111         | 63.7             | 7/12         | 32           | 12.4        |
| WA 8373                              | ---          | ---        | 110         | 63.2             | 7/12         | 37           | 11.7        |
| <b>WA 8330 (W)</b>                   | 60           | 115        | 110         | 63.3             | 7/12         | 35           | 11.8        |
| MT2030                               | ---          | ---        | 109         | 62.7             | 7/13         | 39           | 13.3        |
| <b>IDO2002 (W)</b>                   | 70           | 117        | 108         | 62.9             | 7/13         | 33           | 11.2        |
| WA 8356                              | 68           | 127        | 108         | 62.8             | 7/12         | 37           | 10.4        |
| WB7696 (W)                           | 62           | 117        | 107         | 62.9             | 7/14         | 34           | 13.0        |
| WA 8342W                             | ---          | 123        | 107         | 62.9             | 7/11         | 34           | 11.8        |
| <b>WB7589 (W)</b>                    | 73           | 107        | 107         | 63.9             | 7/15         | 31           | 11.8        |
| WB9668                               | 61           | 110        | 106         | 63.3             | 7/13         | 32           | 13.3        |
| <b>WB9724CLP</b>                     | ---          | 114        | 106         | 62.8             | 7/13         | 33           | 12.9        |
| WA 8388CL+                           | ---          | 113        | 105         | 62.8             | 7/13         | 34           | 12.1        |
| UI Platinum (W)                      | 64           | 113        | 105         | 61.8             | 7/11         | 32           | 10.8        |
| LCS Hammer AX                        | ---          | ---        | 103         | 62.9             | 7/13         | 34           | 11.2        |
| <b>SY Gunsight</b>                   | 78           | 121        | 103         | 62.2             | 7/12         | 30           | 11.4        |
| IDO2105S                             | 90           | 118        | 103         | 63.0             | 7/12         | 34           | 11.2        |
| <b>WB7313 (W)</b>                    | 67           | 114        | 103         | 60.6             | 7/10         | 31           | 11.3        |
| WA8342R                              | ---          | ---        | 103         | 63.3             | 7/15         | 33           | 10.9        |
| IDO2202CL2                           | ---          | 109        | 102         | 62.5             | 7/12         | 32           | 11.1        |
| Net CL+                              | 80           | 105        | 102         | 62.8             | 7/15         | 37           | 12.4        |
| Espresso                             | 74           | 104        | 102         | 60.1             | 7/17         | 36           | 13.1        |
| MT2063                               | 87           | 104        | 101         | 63.2             | 7/12         | 33           | 11.2        |
| MT1939                               | ---          | ---        | 99          | 62.0             | 7/12         | 35           | 12.5        |
| MT1809                               | ---          | ---        | 97          | 61.8             | 7/12         | 37           | 12.3        |
| WA 8357                              | 85           | 93         | 97          | 63.4             | 7/12         | 43           | 12.1        |
| Glee                                 | 74           | 112        | 96          | 62.9             | 7/14         | 33           | 11.3        |
| Hale                                 | ---          | ---        | 95          | 63.1             | 7/13         | 36           | 10.9        |
| Holmes                               | 71           | 107        | 94          | 63.3             | 7/12         | 33           | 12.5        |
| Dagmar                               | 75           | 102        | 92          | 62.8             | 7/11         | 36           | 13.1        |
| <b>Average</b>                       | <b>73</b>    | <b>113</b> | <b>108</b>  | <b>61.3</b>      | <b>7/8</b>   | <b>33</b>    | <b>12.0</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>14</b>    | <b>13</b>  | <b>20</b>   | <b>0.8</b>       | <b>2</b>     | <b>3</b>     | ---         |
| <b>CV (%)</b>                        | <b>14</b>    | <b>8.4</b> | <b>12.9</b> | <b>0.9</b>       | <b>0.6</b>   | <b>5.4</b>   | ---         |

\* The trial location in 2021 was in Ashton

\*\* Varieties or selections in bold are not statistically different from the top yielding variety. (W) = White

Table 33. Agronomic Data for Hard Spring Wheat at Soda Springs, Dryland, 2023.

| Variety or Selection                 | Yield (bu/A) |             |             | Test Wt.<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|--------------------------------------|--------------|-------------|-------------|---------------------|-----------------|-----------------|----------------|
|                                      | 2021         | 2022        | 2023*       |                     |                 |                 |                |
| Hale                                 | 11           | 19          | <b>58</b>   | 61.5                | 7/12            | 33              | 12.7           |
| SY-Teton (W)                         | 19           | 26          | <b>56</b>   | 58.7                | 7/15            | 28              | 11.7           |
| Alum                                 | 22           | 26          | <b>56</b>   | 61.6                | 7/14            | 30              | 12.5           |
| Dayn (W)                             | 17           | 24          | <b>56</b>   | 61.2                | 7/11            | 31              | 11.5           |
| Net CL+                              | 18           | 27          | <b>55</b>   | 61.8                | 7/17            | 31              | 12.7           |
| SY Gunsight                          | 20           | 27          | <b>52</b>   | 60.0                | 7/13            | 27              | 12.5           |
| UI Gold (W)                          | 17           | 27          | <b>51</b>   | 60.8                | 7/13            | 29              | 11.9           |
| IDO2105S                             | 17           | 26          | <b>51</b>   | 60.8                | 7/12            | 30              | 12.6           |
| Duclair                              | 20           | 28          | <b>51</b>   | 61.7                | 7/11            | 30              | 11.9           |
| WA 8330 (W)                          | 16           | 27          | <b>49</b>   | 61.2                | 7/11            | 30              | 12.2           |
| WB7202CLP (W)                        | 12           | 25          | <b>49</b>   | 60.0                | 7/9             | 27              | 11.7           |
| Glee                                 | 23           | 23          | 48          | 61.4                | 7/12            | 32              | 12.2           |
| WA 8356                              | 18           | 30          | 48          | 60.5                | 7/11            | 32              | 11.7           |
| WA 8388CL+                           | 19           | 25          | 48          | 61.2                | 7/11            | 30              | 14.3           |
| Choteau                              | ---          | 21          | 48          | 61.8                | 7/12            | 28              | 13.2           |
| WA 8373                              | ---          | 21          | 48          | 60.8                | 7/11            | 30              | 12.1           |
| IDO2104HF                            | 18           | 25          | 48          | 60.8                | 7/12            | 30              | 13.3           |
| WB9879CLP                            | 12           | 20          | 48          | 60.6                | 7/14            | 29              | 13.0           |
| MT1939                               | ---          | 26          | 48          | 60.3                | 7/13            | 30              | 11.9           |
| Dagmar                               | ---          | 21          | 47          | 61.6                | 7/12            | 32              | 12.8           |
| Jefferson HF                         | ---          | 25          | 47          | 61.5                | 7/11            | 30              | 11.8           |
| UI Platinum (W)                      | 17           | 24          | 46          | 60.2                | 7/10            | 28              | 12.5           |
| WA 8357                              | 20           | 23          | 46          | 61.8                | 7/14            | 34              | 13.2           |
| WA8342R                              | 16           | 29          | 45          | 60.7                | 7/15            | 27              | 12.8           |
| IDO2002 (W)                          | 17           | 26          | 45          | 60.6                | 7/14            | 29              | 12.6           |
| MT2030                               | 20           | 25          | 45          | 60.9                | 7/11            | 28              | 11.7           |
| Espresso                             | 22           | 30          | 45          | 59.1                | 7/18            | 27              | 14.3           |
| MT1809                               | 18           | 30          | 45          | 61.3                | 7/15            | 31              | 12.9           |
| MT2063                               | ---          | 29          | 44          | 60.9                | 7/11            | 30              | 12.6           |
| Holmes                               | 20           | 26          | 43          | 61.1                | 7/10            | 27              | 13.7           |
| LCS Hammer AX                        | ---          | 23          | 43          | 61.0                | 7/12            | 30              | 12.8           |
| Rocker                               | 20           | 26          | 43          | 61.5                | 7/16            | 28              | 13.5           |
| AP Venom                             | 14           | 29          | 40          | 58.5                | 7/22            | 28              | 13.6           |
| IDO2202CL2                           | ---          | 30          | 39          | 60.8                | 7/11            | 30              | 12.6           |
| WB9724CLP                            | 16           | 24          | 36          | 60.8                | 7/12            | 27              | 12.9           |
| <b>Average</b>                       | <b>18</b>    | <b>25</b>   | <b>47</b>   | <b>60.8</b>         | <b>7/13</b>     | <b>29</b>       | <b>12.6</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>4</b>     | <b>4</b>    | <b>9</b>    | <b>1.0</b>          | <b>1</b>        | <b>2</b>        | ---            |
| <b>CV (%)</b>                        | <b>14.3</b>  | <b>11.8</b> | <b>13.4</b> | <b>1.1</b>          | <b>0.4</b>      | <b>4.3</b>      | ---            |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

No lodging to report and all plots had full stand.

**Table 34. Hard Spring Wheat Yield Percentage of Location Averages, 2023.**

| Variety or Selection           | (100% = Average) |            |             |            |              |                 |
|--------------------------------|------------------|------------|-------------|------------|--------------|-----------------|
|                                | Aberdeen         | Rupert     | Idaho Falls | Tetonia    | Soda Springs | Variety Average |
| WB9707                         | 106              | 112        | 107         | 134        | ---          | 115             |
| Dayn (W)                       | 121              | 110        | 113         | 106        | 117          | 113             |
| UI Gold (W)                    | 112              | 114        | 104         | 110        | 107          | 109             |
| SY-Teton (W)                   | 105              | 98         | 99          | 121        | 118          | 108             |
| Duclair                        | ---              | ---        | ---         | ---        | 106          | 106             |
| Jefferson HF                   | 108              | 108        | 105         | 109        | 98           | 106             |
| WA 8373                        | 104              | 107        | 108         | 106        | 101          | 105             |
| IDO2105S                       | 108              | 105        | 105         | 98         | 106          | 105             |
| WA 8342W                       | 103              | 105        | 107         | 103        | ---          | 104             |
| WA 8356                        | 108              | 103        | 104         | 103        | 102          | 104             |
| AP Venom                       | 105              | 104        | 102         | 121        | 84           | 103             |
| WA 8374 (W)                    | 104              | 97         | 99          | 112        | ---          | 103             |
| Alum                           | 103              | 90         | 93          | 111        | 117          | 103             |
| WA 8372 (W)                    | 110              | 97         | 99          | 106        | ---          | 103             |
| Hale                           | 101              | 99         | 99          | 92         | 122          | 102             |
| MT2030                         | 103              | 110        | 100         | 104        | 95           | 102             |
| WB7202CLP (W)                  | ---              | ---        | ---         | ---        | 102          | 102             |
| WB7313 (W)                     | 97               | 102        | 106         | 100        | ---          | 101             |
| LCS Hammer AX                  | 99               | 113        | 107         | 98         | 90           | 101             |
| WB7696 (W)                     | 95               | 101        | 103         | 104        | ---          | 101             |
| Choteau                        | ---              | ---        | ---         | ---        | 101          | 101             |
| MT2063                         | 104              | 102        | 108         | 96         | 93           | 101             |
| IDO2104HF                      | 100              | 97         | 96          | 109        | 100          | 100             |
| MT1939                         | 105              | 108        | 94          | 95         | 100          | 100             |
| WB9879CLP                      | ---              | ---        | ---         | ---        | 100          | 100             |
| Net CL+                        | 93               | 92         | 98          | 97         | 116          | 99              |
| WA8342R                        | 102              | 100        | 99          | 98         | 95           | 99              |
| WB7589 (W)                     | 93               | 100        | 98          | 103        | ---          | 98              |
| WA 8330 (W)                    | 90               | 96         | 97          | 106        | 103          | 98              |
| Dagmar                         | 95               | 105        | 104         | 88         | 98           | 98              |
| MT1809                         | 92               | 108        | 100         | 92         | 94           | 97              |
| IDO2202CL2                     | 99               | 98         | 106         | 98         | 83           | 97              |
| Espresso                       | 95               | 100        | 98          | 97         | 95           | 97              |
| WA 8359                        | 98               | 78         | 98          | 113        | ---          | 97              |
| WA 8388CL+                     | 93               | ---        | 90          | 101        | 101          | 96              |
| SY Gunsight                    | 96               | 90         | 85          | 98         | 108          | 96              |
| Holmes                         | 95               | 105        | 96          | 91         | 91           | 95              |
| WB9668                         | 88               | 94         | 96          | 103        | ---          | 95              |
| UI Platinum (W)                | 104              | 83         | 90          | 102        | 96           | 95              |
| Glee                           | 95               | 89         | 95          | 92         | 102          | 95              |
| Rocker                         | 99               | ---        | ---         | ---        | 90           | 94              |
| IDO2002 (W)                    | 92               | 88         | 93          | 104        | 95           | 94              |
| WA 8357                        | 95               | 93         | 94          | 92         | 96           | 94              |
| WB9724CLP                      | 88               | 99         | 103         | 100        | 76           | 93              |
| <b>Location Average (bu/A)</b> | <b>127</b>       | <b>117</b> | <b>125</b>  | <b>105</b> | <b>47</b>    |                 |

(W) = White

Chart 4. 2023 Hard Spring Wheat Yield Percentage Across All Locations  
(Average=100%)

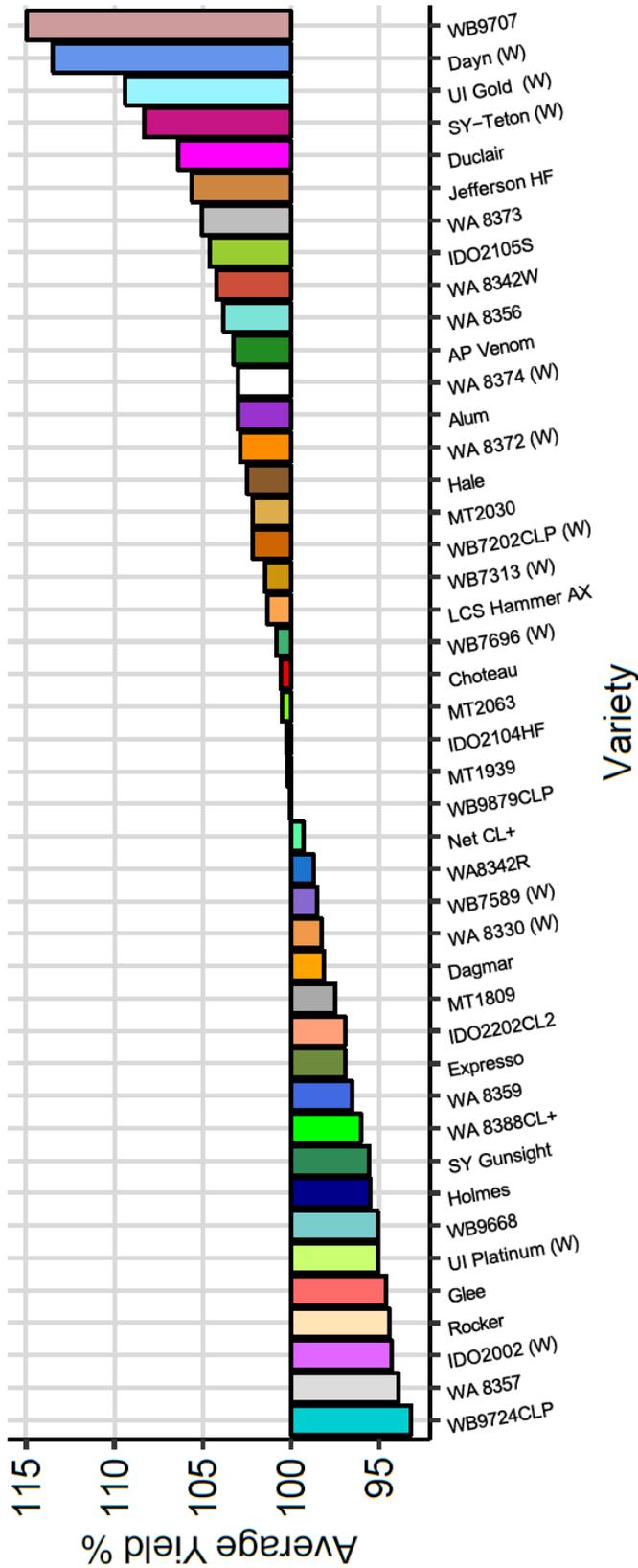


Table 35. Soft White Spring Wheat Irrigated Nurseries, 3-Year Averages (2021-2023; 12 site-years).

| Variety or Selection                 | Yield (bu/A)* | Test Wt (lb/bu) | Spring Stand %  | Heading Date | Height (in.) | Lodging (%) | Protein (%) |
|--------------------------------------|---------------|-----------------|-----------------|--------------|--------------|-------------|-------------|
| <b>WB6430</b>                        | <b>125</b>    | 58.6            | 100             | 6/22         | 32           | 1           | 10.4        |
| <b>WA 8327</b>                       | <b>124</b>    | 59.2            | 100             | 6/26         | 36           | 4           | 10.4        |
| <b>UI Stone</b>                      | <b>122</b>    | 58.7            | 100             | 6/22         | 36           | 2           | 10.3        |
| <b>Alturas</b>                       | <b>121</b>    | 58.5            | 100             | 6/25         | 37           | 1           | 10.4        |
| WA 8351                              | 120           | 60.1            | 100             | 6/24         | 35           | 13          | 11.5        |
| IDO1902S                             | 119           | 60.3            | 100             | 6/22         | 35           | 2           | 10.7        |
| Seahawk                              | 119           | 59.5            | 99              | 6/27         | 37           | 3           | 10.5        |
| UI Cookie                            | 118           | 57.5            | 100             | 6/22         | 36           | 0           | 10.9        |
| Melba**                              | 118           | 58.6            | 100             | 6/27         | 35           | 5           | 10.1        |
| IDO1404S                             | 117           | 58.6            | 100             | 6/25         | 35           | 2           | 10.7        |
| Ryan                                 | 116           | 57.7            | 100             | 6/21         | 34           | 13          | 10.8        |
| Tekoa                                | 112           | 59.6            | 100             | 6/27         | 36           | 9           | 10.5        |
| WB6211CLP                            | 106           | 56.6            | 100             | 6/22         | 34           | 0           | 10.4        |
| Hedge CL+**                          | 101           | 59.0            | 100             | 6/26         | 39           | 40          | 11.7        |
| <b>Average</b>                       | <b>117</b>    | <b>58.8</b>     | <b>100</b>      | <b>6/24</b>  | <b>35</b>    | <b>7</b>    | <b>10.6</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>4.6</b>    | <b>0.3</b>      | <b>0.5 (NS)</b> | <b>0.5</b>   | <b>0.7</b>   | <b>5</b>    | <b>0.3</b>  |
| <b>CV (%)</b>                        | <b>9.7</b>    | <b>1.1</b>      | <b>1.2</b>      | <b>0.7</b>   | <b>5.2</b>   | <b>186</b>  | <b>4.2</b>  |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates club wheat

NS: Non-significant

Table 36. Soft White Spring Wheat Dryland Nurseries, 3-Year Averages (2021-2023; 3 site-years).

| Variety or Selection                 | Yield (bu/A)* | Test Wt (lb/bu) | Spring Stand %  | Heading Date | Height (in.) | Protein (%) |
|--------------------------------------|---------------|-----------------|-----------------|--------------|--------------|-------------|
| <b>Louise</b>                        | <b>40</b>     | 60.0            | 100             | 7/12         | 29           | 9.9         |
| <b>UI Stone</b>                      | <b>40</b>     | 59.5            | 100             | 7/9          | 26           | 10.4        |
| <b>Melba**</b>                       | <b>40</b>     | 60.2            | 100             | 7/13         | 24           | 9.9         |
| <b>AP Coachman</b>                   | <b>40</b>     | 58.3            | 100             | 7/11         | 27           | 9.9         |
| <b>IDO1902S</b>                      | <b>39</b>     | 61.2            | 100             | 7/9          | 27           | 9.9         |
| <b>Ryan</b>                          | <b>38</b>     | 58.5            | 100             | 7/8          | 26           | 10.0        |
| <b>Hedge CL+**</b>                   | <b>38</b>     | 60.4            | 100             | 7/12         | 26           | 10.6        |
| <b>WA 8351</b>                       | <b>36</b>     | 60.8            | 100             | 7/9          | 25           | 10.2        |
| <b>WB6430</b>                        | <b>36</b>     | 60.0            | 100             | 7/9          | 23           | 10.2        |
| <b>Alturas</b>                       | <b>36</b>     | 59.2            | 100             | 7/10         | 25           | 9.9         |
| Seahawk                              | 34            | 60.3            | 100             | 7/12         | 24           | 10.1        |
| WB6211CLP                            | 33            | 57.9            | 100             | 7/8          | 26           | 10.8        |
| IDO1404S                             | 33            | 59.8            | 100             | 7/10         | 26           | 10.0        |
| Tekoa                                | 32            | 61.4            | 100             | 7/11         | 26           | 10.1        |
| UI Cookie                            | 28            | 58.2            | 100             | 7/8          | 26           | 10.3        |
| <b>Average</b>                       | <b>36</b>     | <b>59.6</b>     | <b>100</b>      | <b>7/10</b>  | <b>26</b>    | <b>10.1</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>5</b>      | <b>1</b>        | <b>0.3 (NS)</b> | <b>1</b>     | <b>1</b>     | <b>4</b>    |
| <b>CV (%)</b>                        | <b>15.9</b>   | <b>1.0</b>      | <b>0.5</b>      | <b>0.9</b>   | <b>5.6</b>   | <b>4.3</b>  |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates club wheat

NS: Non-significant

No lodging to report.

Table 37. Irrigated Soft White Spring Wheat Data Combined from Aberdeen, Rupert, Idaho Falls and Tetonia, 2023.

| Variety or Selection                 | Yield (bu/A)* | Test Wt. (lb/bu) | Spring Stand (%) | Heading Date | Height (in.) | Lodging (%)  | Protein (%) |
|--------------------------------------|---------------|------------------|------------------|--------------|--------------|--------------|-------------|
| <b>WB6430</b>                        | <b>137</b>    | 58.4             | 100              | 6/24         | 33           | 0            | 10.4        |
| <b>WA 8327</b>                       | <b>133</b>    | 59.4             | 99               | 6/28         | 36           | 5            | 10.4        |
| <b>Alturas</b>                       | <b>132</b>    | 58.3             | 99               | 6/28         | 39           | 1            | 10.4        |
| <b>UI Stone</b>                      | <b>130</b>    | 58.4             | 99               | 6/23         | 36           | 1            | 10.0        |
| <b>IDO1902S</b>                      | <b>130</b>    | 59.4             | 99               | 6/25         | 38           | 0            | 10.8        |
| <b>WA 8351</b>                       | <b>130</b>    | 60.0             | 99               | 6/25         | 36           | 2            | 10.3        |
| IDO1404S                             | 127           | 58.1             | 100              | 6/27         | 36           | 5            | 10.9        |
| Ryan                                 | 127           | 57.7             | 100              | 6/24         | 35           | 13           | 10.6        |
| Melba**                              | 125           | 58.4             | 100              | 6/29         | 36           | 0            | 10.0        |
| Seahawk                              | 125           | 58.6             | 98               | 6/30         | 39           | 4            | 10.3        |
| UI Cookie                            | 123           | 57.3             | 100              | 6/24         | 37           | 0            | 10.8        |
| Butch CL+                            | 120           | 57.8             | 100              | 6/25         | 34           | 2            | 11.3        |
| WB6211CLP                            | 118           | 56.6             | 100              | 6/24         | 35           | 0            | 11.3        |
| Tekoa                                | 118           | 59.4             | 99               | 6/29         | 37           | 3            | 10.6        |
| Roger (WA 8325)**                    | 112           | 58.2             | 100              | 6/25         | 37           | 18           | 10.2        |
| Hedge CL+**                          | 109           | 58.5             | 100              | 6/27         | 40           | 43           | 11.8        |
| <b>Average</b>                       | <b>125</b>    | <b>58.4</b>      | <b>99</b>        | <b>6/26</b>  | <b>36</b>    | <b>6</b>     | <b>10.6</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>9</b>      | <b>1</b>         | <b>1.4 (NS)</b>  | <b>1</b>     | <b>1</b>     | <b>8</b>     | <b>1.0</b>  |
| <b>CV (%)</b>                        | <b>10.3</b>   | <b>1.6</b>       | <b>2.0</b>       | <b>0.7</b>   | <b>5.2</b>   | <b>189.0</b> | <b>4.3</b>  |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates club wheat

Table 38. Agronomic Data for Soft White Spring Wheat at Rupert, Irrigated, 2023.

| Variety or Selection                 | Yield (bu/A) |            |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|--------------|------------|------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|
|                                      | 2021         | 2022       | 2023*      |                     |                     |                 |                 |                |                |
| <b>WB6430</b>                        | 145          | 112        | <b>128</b> | 57.3                | 100                 | 6/16            | 33              | 0              | 9.3            |
| <b>UI Stone</b>                      | 127          | 103        | <b>125</b> | 57.1                | 100                 | 6/17            | 38              | 0              | 9.5            |
| <b>IDO1902S</b>                      | 132          | 109        | <b>119</b> | 58.0                | 100                 | 6/18            | 37              | 0              | 9.7            |
| UI Cookie                            | 143          | 106        | 117        | 55.8                | 100                 | 6/17            | 37              | 0              | 9.8            |
| IDO1404S                             | 111          | 107        | 116        | 57.0                | 100                 | 6/18            | 36              | 0              | 9.9            |
| Alturas                              | 131          | 102        | 115        | 57.0                | 100                 | 6/19            | 38              | 0              | 9.5            |
| WA 8351                              | 130          | 106        | 115        | 58.1                | 100                 | 6/17            | 36              | 0              | 9.2            |
| Louise                               | 133          | 102        | 112        | 56.9                | 100                 | 6/20            | 40              | 2              | 10.5           |
| WB6211CLP                            | 104          | 96         | 112        | 55.8                | 100                 | 6/17            | 36              | 0              | 10.8           |
| Seahawk                              | 140          | 109        | 112        | 58.1                | 100                 | 6/24            | 39              | 0              | 9.9            |
| Tekoa                                | 111          | 102        | 111        | 41.0                | 100                 | 6/24            | 39              | 0              | 9.4            |
| Hedge CL+**                          | 111          | 93         | 109        | 58.1                | 100                 | 6/21            | 40              | 30             | 10.7           |
| Melba**                              | 133          | 98         | 107        | 58.2                | 99                  | 6/22            | 35              | 0              | 9.5            |
| Ryan                                 | 134          | 112        | 104        | 55.5                | 100                 | 6/15            | 35              | 0              | 10.0           |
| Butch CL+                            | ---          | ---        | 103        | 55.7                | 100                 | 6/17            | 34              | 0              | 10.9           |
| Roger (WA 8325)*                     | ---          | ---        | 96         | 56.8                | 100                 | 6/18            | 35              | 0              | 10.3           |
| <b>Average</b>                       | <b>128</b>   | <b>102</b> | <b>112</b> | <b>56.0</b>         | <b>100</b>          | <b>6/19</b>     | <b>37</b>       | <b>2</b>       | <b>9.9</b>     |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>21</b>    | <b>14</b>  | <b>10</b>  | <b>12.0</b>         | <b>1</b>            | <b>1</b>        | <b>2</b>        | <b>15</b>      | <b>---</b>     |
| <b>CV (%)</b>                        | <b>11.5</b>  | <b>9.8</b> | <b>6.4</b> | <b>14.9</b>         | <b>0.6</b>          | <b>0.6</b>      | <b>3.7</b>      | <b>362.0</b>   | <b>---</b>     |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates club wheat

Table 39. Agronomic Data for Soft White Spring Wheat at Aberdeen, Irrigated, 2023.

| Variety or Selection                 | Yield (Bu/A) |             |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|--------------|-------------|------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|
|                                      | 2021         | 2022        | 2023*      |                     |                     |                 |                 |                |                |
| <b>UI Stone</b>                      | 116          | 128         | <b>154</b> | 57.7                | 96                  | 5/28            | 37              | 3              | 10.7           |
| <b>WB6430</b>                        | 117          | 115         | <b>150</b> | 57.7                | 100                 | 6/17            | 34              | 0              | 11.2           |
| <b>WA 8327</b>                       | 114          | 113         | <b>149</b> | 57.9                | 97                  | 5/31            | 38              | 14             | 11.4           |
| <b>WA 8351</b>                       | 114          | 121         | <b>148</b> | 58.9                | 98                  | 6/18            | 38              | 4              | 10.9           |
| <b>Alturas</b>                       | 123          | 111         | <b>147</b> | 57.1                | 95                  | 5/28            | 41              | 0              | 11.0           |
| <b>IDO1902S</b>                      | 129          | 123         | <b>145</b> | 58.4                | 94                  | 5/26            | 39              | 0              | 11.8           |
| <b>Melba**</b>                       | 120          | 111         | <b>144</b> | 57.5                | 100                 | 6/4             | 39              | 0              | 10.6           |
| <b>UI Cookie</b>                     | 110          | 114         | <b>144</b> | 57.5                | 99                  | 6/17            | 38              | 0              | 11.8           |
| <b>Seahawk</b>                       | 124          | 108         | <b>142</b> | 58.6                | 94                  | 6/2             | 39              | 8              | 11.9           |
| Ryan                                 | 114          | 112         | 139        | 57.2                | 100                 | 5/30            | 38              | 54             | 11.3           |
| Butch CL+                            | --           | --          | 138        | 57.1                | 100                 | 6/17            | 34              | 6              | 11.6           |
| Tekoa                                | 107          | 111         | 137        | 58.4                | 98                  | 6/3             | 37              | 9              | 11.8           |
| IDO1404S                             | 117          | 116         | 136        | 57.3                | 98                  | 5/30            | 36              | 19             | 11.7           |
| Louise                               | 116          | 102         | 130        | 57.2                | 76                  | 6/20            | 40              | 40             | 11.5           |
| Roger (WA 8325)**                    | --           | --          | 128        | 57.6                | 98                  | 5/31            | 38              | 38             | 11.2           |
| WB6211CLP                            | 109          | 115         | 127        | 56.0                | 98                  | 5/30            | 36              | 2              | 12.7           |
| Hedge CL+**                          | 105          | 100         | 115        | 57.6                | 98                  | 6/19            | 42              | 79             | 13.1           |
| <b>Average</b>                       | <b>114</b>   | <b>113</b>  | <b>140</b> | <b>57.6</b>         | <b>96</b>           | <b>6/7</b>      | <b>38</b>       | <b>16</b>      | <b>11.5</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>16</b>    | <b>16</b>   | <b>13</b>  | <b>1</b>            | <b>17(NS)</b>       | <b>28(NS)</b>   | <b>3</b>        | <b>25</b>      | <b>--</b>      |
| <b>CV (%)</b>                        | <b>9.7</b>   | <b>10.2</b> | <b>6.6</b> | <b>1.4</b>          | <b>12.1</b>         | <b>12.3</b>     | <b>5.8</b>      | <b>106.9</b>   | <b>--</b>      |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates club wheat

NS: Non-significant

Table 40. Agronomic Data for Soft White Spring Wheat, Idaho Falls, Irrigated, 2023.

| Variety or Selection                 | Yield (bu/A) |            |            | Test Wt.<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|--------------|------------|------------|---------------------|-----------------|-----------------|----------------|----------------|
|                                      | 2021         | 2022       | 2023*      |                     |                 |                 |                |                |
| <b>IDO1902S</b>                      | 143          | 129        | <b>143</b> | 60.5                | 6/24            | 37              | 0              | 10.5           |
| <b>UI Stone</b>                      | 136          | 130        | <b>143</b> | 58.6                | 6/20            | 36              | 0              | 9.5            |
| <b>WB6430</b>                        | 138          | 125        | <b>142</b> | 58.6                | 6/21            | 32              | 0              | 10.0           |
| <b>Ryan</b>                          | 130          | 110        | <b>140</b> | 58.2                | 6/22            | 35              | 0              | 10.5           |
| <b>WA 8327</b>                       | 138          | 131        | <b>138</b> | 59.4                | 5/21            | 28              | 0              | 9.9            |
| <b>Alturas</b>                       | 135          | 132        | <b>138</b> | 59.5                | 6/27            | 40              | 2              | 10.4           |
| <b>UI Cookie</b>                     | 137          | 126        | <b>131</b> | 57.1                | 5/18            | 29              | 0              | 10.7           |
| <b>Melba**</b>                       | 131          | 113        | <b>131</b> | 59.9                | 6/29            | 37              | 0              | 9.6            |
| <b>IDO1404S</b>                      | 134          | 118        | <b>130</b> | 58.3                | 6/25            | 36              | 0              | 10.8           |
| <b>Seahawk</b>                       | 123          | 122        | <b>128</b> | 60.8                | 6/28            | 39              | 6              | 10.2           |
| <b>WA 8351</b>                       | 131          | 119        | <b>127</b> | 60.2                | 6/24            | 35              | 5              | 10.3           |
| Tekoa                                | 121          | 116        | 125        | 60.5                | 6/26            | 38              | 3              | 10.3           |
| <b>WB6211CLP</b>                     | 122          | 106        | 119        | 56.4                | 5/8             | 22              | 0              | 11.4           |
| Butch CL+                            | ---          | ---        | 119        | 58.7                | 6/24            | 34              | 1              | 11.5           |
| Hedge CL+**                          | 114          | 85         | 118        | 59.9                | 6/26            | 41              | 50             | 12.1           |
| Roger (WA 8325)**                    | ---          | ---        | 113        | 58.6                | 6/25            | 36              | 13             | 9.9            |
| <b>Average</b>                       | <b>128</b>   | <b>118</b> | <b>130</b> | <b>59.1</b>         | <b>6/17</b>     | <b>35</b>       | <b>5</b>       | <b>10.5</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>10</b>    | <b>10</b>  | <b>16</b>  | <b>0.7</b>          | <b>44</b>       | <b>12</b>       | <b>15</b>      | ---            |
| <b>CV (%)</b>                        | <b>5.5</b>   | <b>5.9</b> | <b>8.3</b> | <b>0.8</b>          | <b>17.7</b>     | <b>22.7</b>     | <b>175.4</b>   | ---            |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates club wheat

\*\*\*All plots had full stand.

Table 41. Agronomic Data for Soft White Spring Wheat at Tetonia, Irrigated, 2023.

| Variety or Selection                 | Yield (bu/A) |            |             | Test Wt.<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) |
|--------------------------------------|--------------|------------|-------------|---------------------|-----------------|-----------------|----------------|----------------|
|                                      | 2021*        | 2022       | 2023**      |                     |                 |                 |                |                |
| Melba***                             | 64           | 125        | <b>128</b>  | 60.9                | 7/14            | 35              | 0              | 10.3           |
| WB6430                               | 71           | 127        | <b>127</b>  | 61                  | 7/13            | 32              | 0              | 10.9           |
| Alturas                              | 69           | 120        | <b>127</b>  | 61.3                | 7/16            | 37              | 0              | 10.8           |
| WA 8351                              | 70           | 134        | <b>126</b>  | 63.6                | 7/12            | 35              | 0              | 10.8           |
| IDO1404S                             | 70           | 121        | <b>124</b>  | 61.4                | 7/14            | 36              | 0              | 11.0           |
| Seahawk                              | 73           | 119        | <b>122</b>  | 59.8                | 7/15            | 37              | 0              | 9.0            |
| Butch CL+                            | ---          | ---        | <b>120</b>  | 61.9                | 7/13            | 34              | 0              | 11.1           |
| Ryan                                 | 57           | 115        | <b>120</b>  | 61.2                | 7/12            | 35              | 0              | 10.7           |
| WA 8327                              | 86           | 141        | <b>119</b>  | 62.0                | 7/11            | 35              | 0              | 9.9            |
| IDO1902S                             | 81           | 133        | <b>119</b>  | 63.1                | 7/13            | 37              | 0              | 11.1           |
| WB6211CLP                            | 56           | 98         | <b>114</b>  | 59.0                | 7/12            | 36              | 0              | 10.4           |
| Roger (WA 8325)***                   | ---          | ---        | <b>109</b>  | 61.0                | 7/11            | 38              | 21             | 9.4            |
| UI Cookie                            | 58           | 120        | 103         | 59.0                | 7/11            | 36              | 0              | 10.8           |
| UI Stone                             | 52           | 130        | 102         | 60.8                | 7/12            | 35              | 0              | 10.4           |
| Tekoa                                | 83           | 112        | 101         | 62.3                | 7/14            | 36              | 0              | 10.8           |
| Hedge CL+***                         | 69           | 98         | 92          | 60.6                | 7/14            | 36              | 30             | 11.2           |
| <b>Average</b>                       | <b>65</b>    | <b>120</b> | <b>116</b>  | <b>61.2</b>         | <b>7/13</b>     | <b>35</b>       | <b>3</b>       | <b>10.5</b>    |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>12</b>    | <b>14</b>  | <b>27</b>   | <b>1.6</b>          | <b>2</b>        | <b>3</b>        | <b>16.7</b>    | <b>---</b>     |
| <b>CV (%)</b>                        | <b>13</b>    | <b>7.9</b> | <b>16.1</b> | <b>1.9</b>          | <b>0.7</b>      | <b>6.6</b>      | <b>347.6</b>   | <b>---</b>     |

\* The trial location in 2021 was in Ashton.

\*\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\*\* Indicates club wheat

Table 42. Agronomic Data for Soft White Spring Wheat at Soda Springs, Dryland, 2023.

| Variety or Selection                  | Yield (bu/A) |             |             | Test Wt.<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) |
|---------------------------------------|--------------|-------------|-------------|---------------------|-----------------|-----------------|----------------|
|                                       | 2021         | 2022        | 2023*       |                     |                 |                 |                |
| <b>UI Stone</b>                       | 24           | 32          | <b>64</b>   | 60.1                | 7/14            | 31              | 10.3           |
| <b>AP Coachman</b>                    | 24           | 35          | <b>61</b>   | 57.8                | 7/14            | 31              | 10.2           |
| <b>Hedge CL+***</b>                   | 22           | 33          | <b>59</b>   | 60.4                | 7/16            | 31              | 10.8           |
| <b>IDO1902S</b>                       | 26           | 29          | <b>58</b>   | 60.9                | 7/14            | 31              | 10.4           |
| <b>Louise</b>                         | 29           | 28          | <b>57</b>   | 60.0                | 7/16            | 36              | 10.0           |
| <b>Roger (WA 8325)**</b>              | 70           | ---         | <b>56</b>   | 59.1                | 7/14            | 31              | 10.3           |
| <b>Melba**</b>                        | 27           | 29          | <b>54</b>   | 59.1                | 7/17            | 28              | 10.8           |
| <b>WB6430</b>                         | 21           | 29          | <b>54</b>   | 60.1                | 7/14            | 26              | 10.9           |
| Ryan                                  | 26           | 31          | 51          | 58.5                | 7/13            | 30              | 10.2           |
| WA 8351                               | 26           | 34          | 50          | 57.9                | 7/12            | 30              | 10.8           |
| WB6211CLP                             | 23           | 28          | 50          | 61.8                | 7/13            | 27              | 10.3           |
| Alturas                               | 24           | 35          | 49          | 59.8                | 7/15            | 29              | 10.2           |
| IDO1404S                              | 20           | 31          | 48          | 60.1                | 7/14            | 29              | 10.5           |
| Seahawk                               | 26           | 33          | 43          | 59.6                | 7/17            | 27              | 10.8           |
| Butch CL+                             | ---          | 32          | 43          | 59.2                | 7/14            | 28              | 10.9           |
| UI Cookie                             | 18           | 25          | 43          | 58.7                | 7/13            | 32              | 11.4           |
| Tekoa                                 | 21           | 34          | 41          | 61.4                | 7/15            | 30              | 10.7           |
| <b>Average</b>                        | <b>23</b>    | <b>31</b>   | <b>52</b>   | <b>59.6</b>         | <b>7/14</b>     | <b>30</b>       | <b>10.6</b>    |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>4</b>     | <b>6</b>    | <b>11</b>   | <b>1</b>            | <b>3</b>        | <b>2</b>        | ---            |
| <b>CV (%)</b>                         | <b>12.6</b>  | <b>12.0</b> | <b>14.8</b> | <b>0.9</b>          | <b>0.9</b>      | <b>4.8</b>      | ---            |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates club wheat

No lodging or stand losses to report at this location.

**Table 43. Soft White Spring Wheat Yield Percentage of Location Averages, 2023.**

| Variety or Selection           | (100% = Average) |            |             |            |              | Variety Average |
|--------------------------------|------------------|------------|-------------|------------|--------------|-----------------|
|                                | Aberdeen         | Rupert     | Idaho Falls | Tetonia    | Soda Springs |                 |
| AP Coachman                    | ---              | ---        | ---         | ---        | 117          | <b>117</b>      |
| WB6430                         | 107              | 114        | 109         | 110        | 104          | <b>109</b>      |
| UI Stone                       | 110              | 111        | 110         | 88         | 123          | <b>109</b>      |
| IDO1902S                       | 103              | 106        | 110         | 103        | 112          | <b>107</b>      |
| WA 8327                        | 106              | ---        | 106         | 103        | ---          | <b>105</b>      |
| Alturas                        | 105              | 103        | 106         | 109        | 94           | <b>104</b>      |
| Melba*                         | 103              | 96         | 100         | 110        | 105          | <b>103</b>      |
| WA 8351                        | 106              | 102        | 97          | 109        | 96           | <b>102</b>      |
| Louise                         | 93               | 100        | ---         | ---        | 110          | <b>101</b>      |
| Ryan                           | 100              | 93         | 108         | 104        | 99           | <b>101</b>      |
| IDO1404S                       | 97               | 104        | 100         | 107        | 93           | <b>100</b>      |
| Seahawk                        | 102              | 100        | 98          | 105        | 83           | <b>98</b>       |
| UI Cookie                      | 103              | 104        | 101         | 89         | 82           | <b>96</b>       |
| WB6211CLP                      | 91               | 100        | 91          | 98         | 96           | <b>95</b>       |
| Butch CL+                      | 99               | 92         | 91          | 104        | 83           | <b>94</b>       |
| Roger (WA 8325)*               | 91               | 85         | 87          | 94         | 108          | <b>93</b>       |
| Hedge CL+*                     | 82               | 97         | 91          | 79         | 114          | <b>92</b>       |
| Tekoa                          | 98               | 99         | 96          | 87         | 79           | <b>92</b>       |
| <b>Location Average (bu/A)</b> | <b>140</b>       | <b>112</b> | <b>130</b>  | <b>116</b> | <b>52</b>    |                 |

\* Indicates club wheat

Chart 5. 2023 Soft White Spring Wheat Yield Percentage Across All Locations  
(Average=100%)

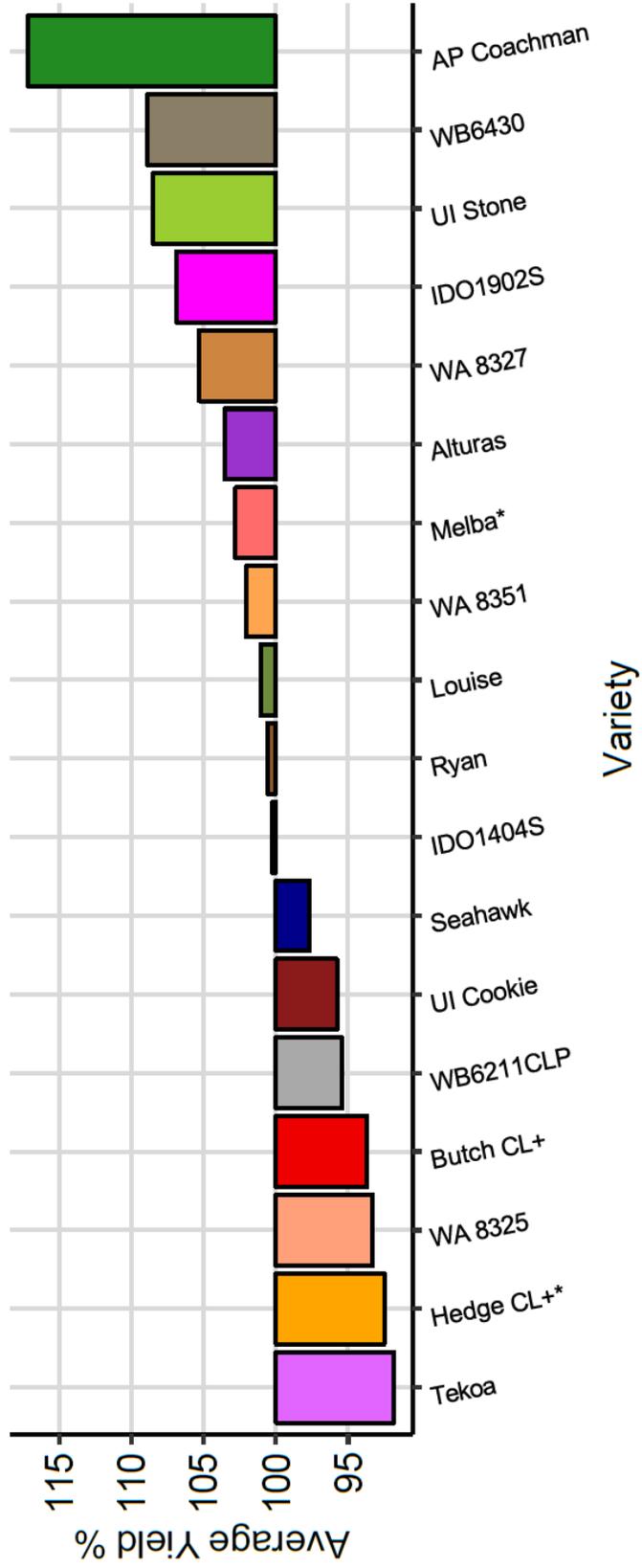


Table 44. Spring Malt Barley Irrigated Nurseries, 3-Year Averages (2021-2023; 12 site-years).

| Variety                              | Yield<br>(bu/A)* | Test Wt<br>(lb/bu) | Spring<br>Stand % | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump<br>(>6/64) | Plump<br>(>5.5/64) | % Thin      |
|--------------------------------------|------------------|--------------------|-------------------|-----------------|-----------------|----------------|----------------|------------------|--------------------|-------------|
| <b>Esma</b>                          | <b>152</b>       | 49.5               | 100               | 6/26            | 33              | 24             | 10.8           | 93.9             | 4.2                | 2.4         |
| <b>BC Leandra</b>                    | <b>147</b>       | 48.3               | 100               | 6/28            | 31              | 25             | 10.5           | 94.2             | 4.1                | 2.1         |
| LCS Odyssey                          | 144              | 48.7               | 100               | 6/28            | 31              | 26             | 10.6           | 94.6             | 3.7                | 2.1         |
| BC Lexy                              | 143              | 47.9               | 100               | 6/27            | 31              | 21             | 10.0           | 94.1             | 3.9                | 2.7         |
| Moravian 179                         | 139              | 49.5               | 99                | 6/28            | 32              | 14             | 11.5           | 95.2             | 3.2                | 1.8         |
| ABI Eagle                            | 137              | 49.8               | 99                | 6/26            | 35              | 17             | 11.4           | 94.7             | 3.7                | 1.9         |
| GemCraft                             | 137              | 48.8               | 100               | 6/27            | 35              | 36             | 10.8           | 91.7             | 5.1                | 3.3         |
| LCS Genie                            | 135              | 49.8               | 100               | 6/29            | 32              | 21             | 10.3           | 94.0             | 4.0                | 2.5         |
| ABI Raptor                           | 131              | 49.1               | 99                | 6/25            | 36              | 20             | 10.9           | 95.2             | 2.6                | 2.0         |
| ABI Voyager                          | 128              | 49.8               | 99                | 6/24            | 38              | 33             | 11.5           | 96.7             | 2.1                | 1.6         |
| CDC Copeland                         | 128              | 49.9               | 100               | 6/28            | 40              | 35             | 10.9           | 93.5             | 4.3                | 2.8         |
| Moravian 69                          | 127              | 48.7               | 100               | 6/29            | 32              | 30             | 10.8           | 90.5             | 5.9                | 3.2         |
| Conrad                               | 126              | 50.2               | 100               | 6/26            | 37              | 30             | 11.9           | 94.4             | 3.6                | 2.4         |
| Merit 57                             | 122              | 48.6               | 98                | 6/28            | 37              | 24             | 11.0           | 89.5             | 6.5                | 4.2         |
| AC Metcalfe                          | 117              | 50.3               | 100               | 6/25            | 39              | 44             | 11.7           | 94.4             | 3.6                | 2.4         |
| <b>Average</b>                       | <b>134</b>       | <b>49.0</b>        | <b>100</b>        | <b>6/27</b>     | <b>34</b>       | <b>27</b>      | <b>10.9</b>    | <b>93.7</b>      | <b>4.0</b>         | <b>2.4</b>  |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>6</b>         | <b>1</b>           | <b>1</b>          | <b>0.4</b>      | <b>1</b>        | <b>10</b>      | <b>0.3</b>     | <b>3</b>         | <b>1</b>           | <b>1</b>    |
| <b>CV (%)</b>                        | <b>11.0</b>      | <b>2.6</b>         | <b>2.2</b>        | <b>0.6</b>      | <b>8.3</b>      | <b>92.9</b>    | <b>4.3</b>     | <b>3.3</b>       | <b>43.7</b>        | <b>56.4</b> |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

Table 45. Spring Malt Barley Dryland Nurseries, 3-Year Averages (2021-2023; 3 site-years).

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt<br>(lb/bu) | Spring<br>Stand % | Heading<br>Date | Height<br>(in.) | Protein<br>(%) | (>6/64)     | Plump<br>(>5.5/64) | % Thin      |
|--------------------------------------|------------------|--------------------|-------------------|-----------------|-----------------|----------------|-------------|--------------------|-------------|
| <b>GemCraft</b>                      | <b>46</b>        | 49.1               | 100               | 7/14            | 23              | 10.8           | 88.8        | 7.8                | 3.6         |
| <b>Esma</b>                          | <b>45</b>        | 49.8               | 100               | 7/12            | 23              | 10.8           | 91.1        | 6.9                | 2.4         |
| CDC Copeland                         | 40               | 49.3               | 99                | 7/15            | 26              | 11.4           | 95.1        | 3.3                | 1.3         |
| Moravian 69                          | 40               | 49.5               | 100               | 7/16            | 23              | 11.5           | 88.6        | 8.2                | 3.3         |
| Merit 57                             | 39               | 49.6               | 100               | 7/14            | 23              | 11.1           | 87.8        | 8.3                | 3.8         |
| Conrad                               | 39               | 49.8               | 100               | 7/15            | 24              | 11.8           | 94.1        | 4.7                | 1.7         |
| ABI Voyager                          | 38               | 50.4               | 100               | 7/14            | 24              | 11.4           | 96.3        | 2.6                | 1.4         |
| AC Metcalfe                          | 36               | 49.2               | 99                | 7/12            | 25              | 11.3           | 93.6        | 4.6                | 1.7         |
| <b>Average</b>                       | <b>40</b>        | <b>49.5</b>        | <b>100</b>        | <b>7/14</b>     | <b>24</b>       | <b>11.2</b>    | <b>91.9</b> | <b>5.7</b>         | <b>2.3</b>  |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>2</b>         | <b>1</b>           | <b>1</b>          | <b>1</b>        | <b>2</b>        | <b>1</b>       | <b>6</b>    | <b>4</b>           | <b>2</b>    |
| <b>CV (%)</b>                        | <b>12</b>        | <b>1.4</b>         | <b>0.7</b>        | <b>0.8</b>      | <b>8.0</b>      | <b>3.8</b>     | <b>3.4</b>  | <b>35.2</b>        | <b>48.8</b> |

\* Variety or selection in bold are not statistically different from the top yielding variety.  
No lodging to report.

Table 46. Irrigated Spring Malt Barley Data Combined from Aberdeen, Idaho Falls, Rupert and Tetonia, 2023

| Variety or Selection (bu/A)*         | Yield (lb/bu) | Test Wt (lb/bu) | Spring Stand % | Heading Date | Height (in.) | Lodging (%) | Protein (%) | (>6/64)     | Plump (>5.5/64) | % Thin      |
|--------------------------------------|---------------|-----------------|----------------|--------------|--------------|-------------|-------------|-------------|-----------------|-------------|
| <b>Esma</b>                          | <b>162</b>    | 49.4            | 99             | 6/28         | 34           | 18          | 11.2        | 96.9        | 2.1             | 1.0         |
| <b>BC Leandra</b>                    | <b>158</b>    | 48.0            | 100            | 6/29         | 33           | 21          | 10.4        | 96.1        | 2.5             | 1.5         |
| <b>16ARS067-13</b>                   | <b>157</b>    | 50.4            | 100            | 6/30         | 32           | 19          | 10.7        | 95.1        | 3.4             | 1.6         |
| <b>BC Lexy</b>                       | <b>157</b>    | 48.2            | 99             | 6/30         | 31           | 17          | 10.1        | 97.6        | 1.5             | 1.0         |
| <b>S14230-41513</b>                  | <b>154</b>    | 50.2            | 100            | 6/30         | 36           | 7           | 11.0        | 98.0        | 1.3             | 0.8         |
| LCS Odyssey                          | 151           | 48.6            | 100            | 6/30         | 32           | 24          | 10.9        | 97.0        | 2.3             | 1.0         |
| 2IM18-4142                           | 149           | 48.8            | 99             | 6/28         | 37           | 6           | 11.3        | 95.6        | 2.9             | 1.3         |
| 17ARS072-5                           | 147           | 48.8            | 100            | 6/30         | 36           | 29          | 11.1        | 94.8        | 3.1             | 2.1         |
| LCS Diablo                           | 147           | 46.6            | 100            | 7/1          | 32           | 27          | 10.3        | 95.5        | 2.9             | 1.5         |
| GemCraft                             | 147           | 48.7            | 100            | 6/29         | 35           | 44          | 11.0        | 94.0        | 3.6             | 2.0         |
| LG8016-1320A                         | 147           | 48.5            | 99             | 7/1          | 32           | 12          | 10.6        | 96.5        | 2.3             | 1.3         |
| 17ARS069-1                           | 145           | 48.9            | 100            | 6/27         | 39           | 22          | 12.8        | 96.4        | 2.1             | 1.5         |
| ABI Raptor                           | 144           | 48.4            | 99             | 6/27         | 36           | 35          | 11.5        | 95.7        | 2.1             | 1.8         |
| 2IM17-2221                           | 144           | ---             | 100            | 6/29         | 36           | 19          | 11.5        | 96.7        | 1.5             | 1.4         |
| ABI Eagle                            | 141           | 48.7            | 99             | 6/29         | 36           | 30          | 11.9        | 94.7        | 3.2             | 1.8         |
| Moravian 179                         | 140           | 49.2            | 99             | 7/2          | 32           | 5           | 11.8        | 97.8        | 1.4             | 0.9         |
| AAC Prairie                          | 139           | 49.8            | 100            | 6/29         | 38           | 46          | 12.0        | 95.1        | 2.4             | 1.9         |
| Moravian 69                          | 137           | 49.2            | 100            | 7/3          | 33           | 33          | 11.1        | 95.4        | 3.4             | 1.4         |
| CDC Copeland                         | 137           | 50.1            | 100            | 7/1          | 41           | 37          | 11.5        | 95.2        | 2.6             | 2.0         |
| LCS Genie                            | 136           | 49.6            | 100            | 7/2          | 34           | 19          | 10.7        | 96.1        | 2.6             | 1.5         |
| ABI Voyager                          | 134           | 49.7            | 99             | 6/27         | 39           | 34          | 11.9        | 97.1        | 1.2             | 1.5         |
| Merit 57                             | 132           | 49.4            | 99             | 6/30         | 37           | 20          | 11.3        | 94.1        | 3.7             | 2.3         |
| Conrad                               | 131           | 49.9            | 99             | 6/28         | 37           | 32          | 12.5        | 95.2        | 2.7             | 1.9         |
| AC Metcalfe                          | 129           | 50.2            | 100            | 6/27         | 40           | 52          | 12.3        | 95.8        | 2.6             | 1.6         |
| <b>Average</b>                       | <b>144</b>    | <b>48.9</b>     | <b>100</b>     | <b>6/29</b>  | <b>35</b>    | <b>24</b>   | <b>11.2</b> | <b>95.9</b> | <b>2.4</b>      | <b>1.5</b>  |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>9</b>      | <b>0.5</b>      | <b>0.9</b>     | <b>0.7</b>   | <b>2</b>     | <b>16</b>   | <b>1.0</b>  | <b>2.0</b>  | <b>1.0</b>      | <b>1.0</b>  |
| <b>CV (%)</b>                        | <b>9.3</b>    | <b>1.5</b>      | <b>1.3</b>     | <b>0.6</b>   | <b>8.8</b>   | <b>94.0</b> | <b>4.1</b>  | <b>1.3</b>  | <b>31.2</b>     | <b>36.7</b> |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

Table 47. Agronomic Data for Two-rowed Malt Barley at Rupert, Irrigated, 2023.

| Variety or Selection                 | Yield (Bu/A) |             |             | Test Wt<br>(lb/bu) | Spring<br>Stand % | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |            |            |
|--------------------------------------|--------------|-------------|-------------|--------------------|-------------------|-----------------|-----------------|----------------|----------------|-------------|------------|------------|
|                                      | 2021         | 2022        | 2023*       |                    |                   |                 |                 |                |                | (>6/64      | (>5.5/64   | % Thin     |
| BC Lexy                              | 131          | 123         | <b>171</b>  | 48.4               | 100               | 6/21            | 28              | 0              | 9.5            | 98.3        | 0.6        | 0.4        |
| LCS Diablo                           | ---          | 119         | <b>166</b>  | 47.3               | 100               | 6/22            | 32              | 0              | 9.8            | 96.7        | 1.4        | 0.6        |
| Esma                                 | 145          | 152         | <b>162</b>  | 49.1               | 100               | 6/21            | 30              | 0              | 10.5           | 97.6        | 1          | 0.5        |
| LCS Odyssey                          | 151          | 129         | <b>160</b>  | 49.1               | 100               | 6/22            | 30              | 0              | 10.2           | 97.4        | 1.5        | 0.4        |
| BC Leandra                           | 131          | 135         | <b>159</b>  | 48.7               | 99                | 6/21            | 30              | 0              | 9.9            | 97.0        | 1.5        | 0.6        |
| GemCraft                             | 134          | 132         | <b>158</b>  | 50.1               | 100               | 6/21            | 34              | 0              | 10.0           | 96.7        | 1.2        | 0.6        |
| 2IM17-2221                           | ---          | 134         | <b>157</b>  | 49.4               | 100               | 6/21            | 30              | 0              | 10.9           | 96.8        | 0.9        | 0.6        |
| 16ARS067-13                          | ---          | ---         | <b>154</b>  | 50.6               | 100               | 6/22            | 29              | 0              | 10.3           | 96.8        | 1.6        | 0.8        |
| LG8016-1320A                         | ---          | ---         | <b>153</b>  | 47.1               | 98                | 6/20            | 32              | 0              | 10.4           | 98.4        | 0.8        | 0.2        |
| AAC Prairie                          | ---          | ---         | <b>153</b>  | 50.6               | 99                | 6/22            | 40              | 1              | 11.4           | 97.9        | 0.7        | 0.5        |
| ABI Raptor                           | ---          | ---         | <b>152</b>  | 48.3               | 100               | 6/20            | 34              | 0              | 11.0           | 97.8        | 1.3        | 0.8        |
| 17ARS072-5                           | ---          | ---         | <b>150</b>  | 49.6               | 100               | 6/22            | 35              | 0              | 10.2           | 96.6        | 1.4        | 1          |
| S14230-41513                         | ---          | ---         | <b>150</b>  | 49.1               | 100               | 6/21            | 34              | 0              | 11.1           | 98.2        | 0.5        | 0.3        |
| 2IM18-4142                           | ---          | ---         | <b>147</b>  | 48.5               | 100               | 6/21            | 34              | 0              | 10.8           | 95.6        | 2.6        | 1.0        |
| 17ARS069-1                           | ---          | ---         | 144         | 50.2               | 100               | 6/20            | 34              | 3              | 11.7           | 96.8        | 1.5        | 0.9        |
| CDC Copeland                         | 130          | 133         | 142         | 50.9               | 99                | 6/26            | 41              | 0              | 10.7           | 97.5        | 0.7        | 0.5        |
| AC Metcalfe                          | 98           | 115         | 139         | 50.9               | 100               | 6/21            | 38              | 3              | 11.1           | 97.9        | 1.4        | 0.3        |
| ABI Eagle                            | 144          | 150         | 137         | 48.7               | 99                | 6/21            | 33              | 6              | 11.1           | 97.8        | 1.1        | 0.4        |
| Conrad                               | 118          | 139         | 135         | 50.4               | 99                | 6/21            | 34              | 0              | 11.5           | 97.4        | 1          | 0.4        |
| LCS Genie                            | 142          | 118         | 134         | 49.6               | 100               | 6/26            | 33              | 0              | 10.5           | 96.5        | 1.9        | 0.8        |
| Moravian 69                          | 127          | 120         | 133         | 49.3               | 100               | 6/27            | 34              | 0              | 11.1           | 97.5        | 1.4        | 0.5        |
| Moravian 179                         | 138          | 131         | 131         | 49.4               | 99                | 6/25            | 29              | 6              | 11.7           | 98          | 0.7        | 0.3        |
| ABI Voyager                          | 117          | 140         | 129         | 49.8               | 98                | 6/21            | 36              | 1              | 11.0           | 98.4        | 0.3        | 0.3        |
| Merit 57                             | 126          | 131         | 127         | 48.7               | 100               | 6/21            | 33              | 0              | 10.1           | 96.6        | 1.9        | 0.8        |
| <b>Average</b>                       | <b>131</b>   | <b>131</b>  | <b>148</b>  | <b>49.3</b>        | <b>100</b>        | <b>6/22</b>     | <b>33</b>       | <b>1</b>       | <b>10.7</b>    | <b>97.3</b> | <b>1.2</b> | <b>0.6</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>25</b>    | <b>20</b>   | <b>25</b>   | <b>0.6</b>         | <b>1</b>          | <b>1</b>        | <b>4</b>        | <b>5</b>       | ---            | ---         | ---        | ---        |
| <b>CV (%)</b>                        | <b>13.5</b>  | <b>10.7</b> | <b>12.0</b> | <b>0.9</b>         | <b>1.1</b>        | <b>0</b>        | <b>10</b>       | <b>513.3</b>   | ---            | ---         | ---        | ---        |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

Table 48. Agronomic Data for Two-rowed Malt Barley at Aberdeen, Irrigated, 2023.

| Variety or Selection                 | Yield (Bu/A) |            |            | Test Wt<br>(lb/bu) | Spring<br>Stand % | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |            |            |
|--------------------------------------|--------------|------------|------------|--------------------|-------------------|-----------------|-----------------|----------------|----------------|-------------|------------|------------|
|                                      | 2021         | 2022       | 2023*      |                    |                   |                 |                 |                |                | (>6/64      | (>5.5/64   | % Thin     |
| BC Lexy                              | 147          | 147        | <b>178</b> | 48.8               | 98                | 6/23            | 35              | 3              | 10.4           | 98.4        | 0.9        | 0.8        |
| Esma                                 | 171          | 131        | <b>173</b> | 49.7               | 98                | 6/20            | 39              | 19             | 11.2           | 98.8        | 1.2        | 0.8        |
| <b>16ARS067-13</b>                   | ---          | ---        | <b>169</b> | 50.3               | 100               | 6/24            | 34              | 29             | 10.8           | 96          | 2.8        | 1.5        |
| <b>S14230-41513</b>                  | ---          | ---        | <b>168</b> | 49.8               | 99                | 6/24            | 41              | 4              | 10.9           | 98.4        | 1.1        | 0.9        |
| LCS Odyssey                          | 151          | 135        | 160        | 48.4               | 99                | 6/21            | 37              | 26             | 10.9           | 97.1        | 2.1        | 1.3        |
| BC Leandra                           | 161          | 142        | 160        | 48.1               | 100               | 6/23            | 42              | 1              | 10.0           | 96.9        | 1.6        | 1.2        |
| LG8016-1320A                         | ---          | ---        | 154        | 46.3               | 100               | 6/24            | 35              | 5              | 11.4           | 96.6        | 1.9        | 1.3        |
| 2IM18-4142                           | ---          | ---        | 152        | 48.1               | 98                | 6/19            | 42              | 22             | 11.1           | 97.6        | 1.8        | 1.3        |
| GemCraft                             | 141          | 145        | 149        | 49.6               | 100               | 6/24            | 37              | 54             | 11.6           | 95.9        | 2.8        | 1.5        |
| Moravian 179                         | 155          | 123        | 148        | 49.1               | 96                | 6/27            | 35              | 3              | 11.4           | 98.2        | 1          | 0.8        |
| LCS Diablo                           | ---          | 128        | 147        | 46.6               | 100               | 6/26            | 35              | 34             | 10.3           | 96.0        | 2.9        | 1.7        |
| 17ARS069-1                           | ---          | ---        | 146        | 49.7               | 99                | 6/20            | 44              | 41             | 13.3           | 97.4        | 1.6        | 1.4        |
| Moravian 69                          | 118          | 150        | 146        | 49.4               | 99                | 6/27            | 35              | 71             | 11.0           | 95.3        | 3.3        | 1.5        |
| 17ARS072-5                           | ---          | ---        | 146        | 47.8               | 100               | 6/22            | 42              | 50             | 11.7           | 94.8        | 3          | 2.6        |
| LCS Genie                            | 144          | 144        | 144        | 49.0               | 100               | 6/25            | 37              | 0              | 10.3           | 97          | 2          | 1.5        |
| ABI Voyager                          | 134          | 110        | 142        | 48.9               | 97                | 6/20            | 44              | 66             | 13.1           | 95.3        | 2.2        | 2.5        |
| 2IM17-2221                           | ---          | 124        | 141        | 48.2               | 100               | 6/21            | 42              | 24             | 11.1           | 97.8        | 1.2        | 1.5        |
| ABI Eagle                            | 152          | 119        | 137        | 47.8               | 96                | 6/22            | 40              | 44             | 12.8           | 94.1        | 3.7        | 2          |
| ABI Raptor                           | ---          | ---        | 137        | 48.2               | 97                | 6/19            | 40              | 38             | 11.1           | 95.9        | 1.4        | 2.1        |
| CDC Copeland                         | 119          | 128        | 131        | 49.5               | 100               | 6/24            | 45              | 38             | 12.0           | 92.6        | 3.8        | 3.7        |
| AAC Prairie                          | ---          | ---        | 129        | 48.1               | 99                | 6/23            | 40              | 65             | 12.0           | 93.6        | 3          | 2.6        |
| Merit 57                             | 134          | 115        | 126        | 47.7               | 98                | 6/25            | 43              | 24             | 11.9           | 93.7        | 3.6        | 2.5        |
| AC Metcalfe                          | 122          | 102        | 125        | 48.9               | 98                | 6/20            | 44              | 73             | 13.2           | 94.1        | 3.2        | 2.5        |
| Conrad                               | 131          | 112        | 123        | 49.5               | 98                | 6/18            | 39              | 30             | 12.3           | 95.9        | 2.6        | 1.7        |
| <b>Average</b>                       | <b>140</b>   | <b>127</b> | <b>147</b> | <b>48.6</b>        | <b>99</b>         | <b>6/22</b>     | <b>39</b>       | <b>30</b>      | <b>11.5</b>    | <b>96.1</b> | <b>2.3</b> | <b>1.7</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>20</b>    | <b>16</b>  | <b>15</b>  | <b>1</b>           | <b>3</b>          | <b>2</b>        | <b>6</b>        | <b>36</b>      | ---            | ---         | ---        | ---        |
| <b>CV (%)</b>                        | <b>9.9</b>   | <b>8.8</b> | <b>7.2</b> | <b>1.5</b>         | <b>2.4</b>        | <b>0.7</b>      | <b>10.4</b>     | <b>83.5</b>    | ---            | ---         | ---        | ---        |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

Table 49. Agronomic Data for Two-rowed Malt Barley at Idaho Falls, Irrigated, 2023.

| Variety or Selection                 | Yield (Bu/A) |            |            | Test Wt<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |            |            |
|--------------------------------------|--------------|------------|------------|--------------------|-----------------|-----------------|----------------|----------------|-------------|------------|------------|
|                                      | 2021         | 2022       | 2023*      |                    |                 |                 |                |                | (>6/64)     | (>5.5/64)  | % Thin     |
| Esma                                 | 139          | 159        | <b>170</b> | 49.9               | 6/25            | 31              | 34             | 11.8           | 95.7        | 3.0        | 1.5        |
| BC Leandra                           | 106          | 127        | <b>169</b> | 47.5               | 6/28            | 29              | 80             | 11.6           | 92.7        | 5.0        | 3.3        |
| S14230-41513                         | ---          | ---        | <b>162</b> | 49.1               | 6/29            | 34              | 23             | 10.9           | 98.0        | 2.0        | 1.0        |
| 16ARS067-13                          | ---          | ---        | <b>161</b> | 50.0               | 6/30            | 32              | 48             | 11.3           | 91.4        | 6.3        | 2.7        |
| ABI Eagle                            | 127          | 120        | <b>160</b> | 49.6               | 6/28            | 35              | 41             | 12.4           | 92.0        | 4.7        | 3.2        |
| 2IM18-4142                           | ---          | ---        | <b>159</b> | 49.3               | 6/27            | 37              | 2              | 11.3           | 94.0        | 4.4        | 2.0        |
| Moravian 179                         | 112          | 143        | <b>155</b> | 50.2               | 6/29            | 31              | 8              | 12.4           | 98.8        | 1.5        | 1.0        |
| ABI Raptor                           | ---          | ---        | <b>154</b> | 48.6               | 6/24            | 36              | 83             | 12.4           | 92.6        | 4.0        | 3.2        |
| 17ARS069-1                           | ---          | ---        | <b>154</b> | 51.0               | 6/25            | 40              | 24             | 13.3           | 95.6        | 2.8        | 1.8        |
| 17ARS072-5                           | ---          | ---        | <b>153</b> | 48.8               | 6/30            | 35              | 59             | 11.2           | 92.8        | 4.5        | 3.0        |
| 2IM17-2221                           | ---          | 121        | 151        | 50.3               | 6/27            | 37              | 66             | 12.0           | 94.2        | 3.3        | 2.3        |
| AAC Prairie                          | ---          | ---        | 151        | 49.2               | 6/30            | 37              | 38             | 11.9           | 96.1        | 2.6        | 1.8        |
| CDC Copeland                         | 100          | 116        | 151        | 50.5               | 6/30            | 42              | 71             | 12.2           | 93.8        | 3.8        | 2.6        |
| LCS Diablo                           | ---          | 136        | 150        | 46.0               | 6/30            | 33              | 73             | 11.5           | 92.5        | 5.5        | 2.6        |
| GemCraft                             | 109          | 128        | 148        | 47.3               | 6/26            | 35              | 91             | 11.5           | 89.4        | 6.5        | 4.2        |
| LCS Genie                            | 121          | 126        | 148        | 49.7               | 7/3             | 33              | 69             | 11.0           | 93.8        | 4.7        | 2.5        |
| BC Lexy                              | 117          | 145        | 147        | 47.6               | 6/29            | 32              | 64             | 10.8           | 95.0        | 3.3        | 2.2        |
| LG8016-1320A                         | ---          | ---        | 145        | 46.3               | 7/2             | 32              | 43             | 10.5           | 94.6        | 4.1        | 2.3        |
| Conrad                               | 115          | 112        | 145        | 49.8               | 6/28            | 36              | 88             | 13.5           | 91.0        | 5.1        | 4.0        |
| LCS Odyssey                          | 132          | 131        | 144        | 48.1               | 6/29            | 31              | 68             | 11.8           | 94.7        | 4.5        | 1.8        |
| Merit 57                             | 109          | 99         | 144        | 48.9               | 6/29            | 37              | 56             | 11.9           | 90.1        | 6.5        | 4.5        |
| Moravian 69                          | 98           | 129        | 143        | 49.1               | 7/2             | 32              | 47             | 11.1           | 93.2        | 5.8        | 2.1        |
| ABI Voyager                          | 126          | 128        | 143        | 50.6               | 6/24            | 37              | 30             | 12.0           | 97.3        | 1.3        | 1.7        |
| AC Metcalfe                          | 106          | 113        | 138        | 50.6               | 6/24            | 39              | 73             | 13.1           | 94.6        | 3.7        | 2.3        |
| <b>Average</b>                       | <b>118</b>   | <b>128</b> | <b>152</b> | <b>49.1</b>        | <b>6/28</b>     | <b>34</b>       | <b>51</b>      | <b>11.8</b>    | <b>93.9</b> | <b>4.1</b> | <b>2.5</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>28</b>    | <b>15</b>  | <b>17</b>  | <b>1</b>           | <b>2</b>        | <b>3</b>        | <b>43</b>      | ---            | ---         | ---        | ---        |
| <b>CV (%)</b>                        | <b>15.7</b>  | <b>8.3</b> | <b>8.1</b> | <b>1.7</b>         | <b>0.7</b>      | <b>6.5</b>      | <b>59.5</b>    | ---            | ---         | ---        | ---        |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\*\*All plots had full stand.

Table 50. Agronomic Data for Two-rowed Malt Barley at Tetonia, Irrigated, 2023.

| Variety or Selection                 | Yield (Bu/A) |            |            | Test Wt<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |            |            |
|--------------------------------------|--------------|------------|------------|--------------------|-----------------|-----------------|----------------|----------------|-------------|------------|------------|
|                                      | 2021*        | 2022       | 2023**     |                    |                 |                 |                |                | (>6/64      | (>5.5/64   | % Thin     |
| 16ARS067-13                          | ---          | ---        | <b>144</b> | 50.1               | 7/15            | 31              | 1              | 10.5           | 96.1        | 2.9        | 1.3        |
| Esma                                 | 124          | 158        | <b>144</b> | 49.0               | 7/15            | 34              | 20             | 11.3           | 95.3        | 3.3        | 1.2        |
| BC Leandra                           | 144          | 159        | <b>142</b> | 47.7               | 7/16            | 30              | 3              | 10.0           | 97.7        | 1.7        | 0.8        |
| 17ARS072-5                           | ---          | ---        | <b>140</b> | 49.0               | 7/16            | 34              | 6              | 11.1           | 94.8        | 3.6        | 1.8        |
| LCS Odyssey                          | 146          | 145        | <b>139</b> | 49.1               | 7/17            | 29              | 0              | 10.7           | 98.6        | 1.2        | 0.6        |
| S14230-41513                         | ---          | ---        | <b>138</b> | 49.1               | 7/16            | 33              | 0              | 10.9           | 97.5        | 1.6        | 1.1        |
| 2IM18-4142                           | ---          | ---        | <b>136</b> | 48.9               | 7/15            | 37              | 1              | 12.0           | 95.2        | 2.6        | 1.0        |
| 17ARS069-1                           | ---          | ---        | <b>135</b> | 50.9               | 7/15            | 39              | 19             | 12.9           | 95.8        | 2.3        | 2.0        |
| LG8016-1320A                         | ---          | ---        | <b>134</b> | 46.8               | 7/17            | 30              | 1              | 10.1           | 96.3        | 2.5        | 1.2        |
| ABI Raptor                           | ---          | ---        | <b>134</b> | 48.7               | 7/14            | 34              | 21             | 11.4           | 96.6        | 1.5        | 1.2        |
| BC Lexy                              | 119          | 156        | <b>132</b> | 48.2               | 7/16            | 29              | 0              | 9.6            | 98.6        | 1.0        | 0.5        |
| GemCraft                             | 133          | 154        | <b>132</b> | 48.2               | 7/16            | 36              | 30             | 11.0           | 94.1        | 3.9        | 1.7        |
| ABI Eagle                            | 125          | 146        | <b>131</b> | 48.6               | 7/15            | 35              | 29             | 11.4           | 95.0        | 3.1        | 1.6        |
| Merit 57                             | 105          | 133        | <b>131</b> | 48.7               | 7/15            | 35              | 0              | 11.3           | 96.0        | 2.8        | 1.3        |
| Moravian 179                         | ---          | 156        | <b>128</b> | 48.9               | 7/16            | 32              | 1              | 11.5           | 96.2        | 2.4        | 1.4        |
| Moravian 69                          | ---          | 140        | <b>128</b> | 49.1               | 7/17            | 33              | 12             | 11.1           | 95.7        | 3.1        | 1.4        |
| 2IM17-2221                           | ---          | 142        | 125        | 48.6               | 7/14            | 36              | 13             | 11.9           | 96.1        | 1.4        | 1.5        |
| LCS Diablo                           | ---          | 145        | 125        | 46.7               | 7/16            | 29              | 0              | 9.5            | 96.9        | 1.8        | 1.1        |
| AAC Prairie                          | ---          | ---        | 124        | 49.7               | 7/14            | 38              | 51             | 12.4           | 94.7        | 2.7        | 2.1        |
| CDC Copeland                         | 127          | 130        | 124        | 49.5               | 7/15            | 37              | 40             | 11.2           | 96.8        | 2.1        | 1.0        |
| ABI Voyager                          | 114          | 134        | 123        | 49.6               | 7/14            | 37              | 39             | 11.5           | 97.2        | 1.1        | 1.4        |
| Conrad                               | 115          | 144        | 123        | 50.0               | 7/14            | 38              | 10             | 12.5           | 96.3        | 2.0        | 1.4        |
| LCS Genie                            | 134          | 145        | 120        | 50.0               | 7/17            | 32              | 8              | 11.0           | 97.2        | 1.9        | 1.0        |
| AC Metcalfe                          | 108          | 122        | 114        | 50.0               | 7/14            | 38              | 60             | 11.8           | 96.6        | 1.9        | 1.3        |
| <b>Average</b>                       | <b>124</b>   | <b>144</b> | <b>131</b> | <b>48.9</b>        | <b>7/15</b>     | <b>34</b>       | <b>15</b>      | <b>11.2</b>    | <b>96.3</b> | <b>2.3</b> | <b>1.3</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | ---          | <b>14</b>  | <b>17</b>  | <b>1</b>           | <b>1</b>        | <b>4</b>        | <b>31</b>      | ---            | ---         | ---        | ---        |
| <b>CV (%)</b>                        | ---          | <b>6.9</b> | <b>9.4</b> | <b>1.6</b>         | <b>0.4</b>      | <b>8.0</b>      | <b>151.1</b>   | ---            | ---         | ---        | ---        |

\* The trial location in 2021 was in Ashton.

\*\* Varieties or selections in bold are not statistically different from the top yielding variety.

All plots had full stand.

Table 51. Agronomic Data for Two-row Spring Malt Barley at Soda Springs, Dryland, 2023.

| Variety or Selection | Yield (bu/A) |             |            | Test Wt.<br>(lb/bu) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |            |            |
|----------------------|--------------|-------------|------------|---------------------|-----------------|-----------------|----------------|----------------|-------------|------------|------------|
|                      | 2021         | 2022        | 2023*      |                     |                 |                 |                |                | (>6/64)     | (>5.5/64)  | % Thin     |
| <b>17ARS072-5</b>    | ---          | ---         | <b>66</b>  | 48.1                | 7/21            | 24              | 11             | 11.2           | 96.1        | 1.8        | 0.8        |
| <b>Esma</b>          | 23           | 48          | <b>65</b>  | 49.6                | 7/15            | 27              | 11             | 10.8           | 97.9        | 1.1        | 0.3        |
| <b>GemCraft</b>      | 25           | 43          | <b>64</b>  | 48.3                | 7/17            | 29              | 11             | 11.3           | 96.7        | 1.6        | 0.6        |
| Moravian 69          | 26           | 36          | 56         | 48.9                | 7/21            | 28              | 12             | 12.2           | 96.5        | 1.6        | 0.7        |
| CDC Copeland         | 23           | 35          | 56         | 48.6                | 7/18            | 32              | 11             | 11.0           | 97.3        | 1.1        | 0.5        |
| AAC Prairie          | ---          | ---         | 54         | .                   | 7/15            | 32              | 12             | 11.5           | 96.0        | 0.9        | 0.6        |
| 17ARS069-1           | ---          | ---         | 53         | 50.2                | 7/16            | 30              | 12             | 11.9           | 97.8        | 1.4        | 0.3        |
| 16ARS067-13          | ---          | ---         | 53         | 49.1                | 7/21            | 28              | 11             | 11.3           | 97.1        | 1.3        | 0.9        |
| AC Metcalfe          | 21           | 38          | 50         | .                   | 7/17            | 31              | 11             | 11.3           | 98.1        | 0.5        | 0.4        |
| Conrad               | 20           | 48          | 50         | 48.9                | 7/18            | 30              | 12             | 12.2           | 97.1        | 1.7        | 0.8        |
| ABI Voyager          | 22           | 42          | 49         | .                   | 7/19            | 29              | 11             | 11.4           | 97.7        | 0.6        | 0.5        |
| Merit 57             | 23           | 48          | 47         | 48.9                | 7/19            | 28              | 11             | 11.2           | 95.3        | 2.6        | 0.9        |
| Moravian 179         | ---          | 38          | 46         | 48.4                | 7/22            | 24              | 13             | 13.0           | 96.3        | 1.9        | 0.9        |
| <b>AVERAGE</b>       | <b>24</b>    | <b>43</b>   | <b>55</b>  | <b>48.9</b>         | <b>7/18</b>     | <b>28</b>       | <b>12</b>      | <b>11.6</b>    | <b>96.9</b> | <b>1.4</b> | <b>0.6</b> |
| <b>LSD</b>           | <b>4</b>     | <b>8</b>    | <b>7</b>   | <b>0.6</b>          | <b>2</b>        | <b>4</b>        | ---            | ---            | ---         | ---        | ---        |
| <b>CV</b>            | <b>12.4</b>  | <b>11.7</b> | <b>8.3</b> | <b>0.8</b>          | <b>0.8</b>      | <b>9.9</b>      | ---            | ---            | ---         | ---        | ---        |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

No stand losses to report at this location.

**Table 52. 2-Row Spring Malt Barley Yield Percentage of Location Averages, 2023.**  
(100% = Average)

| Variety or Selection           | Aberdeen   | Rupert     | Idaho Falls | Tetonia    | Soda Springs | Variety Average |
|--------------------------------|------------|------------|-------------|------------|--------------|-----------------|
| Esma                           | 118        | 111        | 112         | 110        | 120          | <b>114</b>      |
| BC Leandra                     | 109        | 109        | 112         | 109        | --           | <b>110</b>      |
| BC Lexy                        | 121        | 117        | 97          | 101        | --           | <b>109</b>      |
| S14230-41513                   | 114        | 102        | 107         | 106        | --           | <b>107</b>      |
| 16ARS067-13                    | 115        | 106        | 106         | 110        | 96           | <b>107</b>      |
| 17ARS072-5                     | 99         | 102        | 102         | 107        | 121          | <b>106</b>      |
| GemCraft                       | 101        | 108        | 98          | 101        | 117          | <b>105</b>      |
| LCS Odyssey                    | 109        | 109        | 95          | 107        | --           | <b>105</b>      |
| 2IM18-4142                     | 103        | 100        | 105         | 104        | --           | <b>103</b>      |
| LCS Diablo                     | 100        | 113        | 99          | 96         | --           | <b>102</b>      |
| LG8016-1320A                   | 104        | 105        | 96          | 103        | --           | <b>102</b>      |
| ABI Raptor                     | 93         | 104        | 102         | 102        | --           | <b>100</b>      |
| 17ARS069-1                     | 99         | 98         | 102         | 104        | 98           | <b>100</b>      |
| 2IM17-2221                     | 96         | 108        | 100         | 96         | --           | <b>100</b>      |
| ABI Eagle                      | 93         | 94         | 106         | 100        | --           | <b>98</b>       |
| AAC Prairie                    | 88         | 105        | 100         | 95         | 98           | <b>97</b>       |
| CDC Copeland                   | 89         | 97         | 100         | 95         | 102          | <b>96</b>       |
| Moravian 69                    | 99         | 91         | 95          | 98         | 103          | <b>96</b>       |
| LCS Genie                      | 98         | 92         | 98          | 92         | --           | <b>95</b>       |
| Moravian 179                   | 100        | 89         | 102         | 98         | 84           | <b>94</b>       |
| ABI Voyager                    | 97         | 88         | 95          | 94         | 90           | <b>93</b>       |
| Conrad                         | 83         | 93         | 96          | 94         | 91           | <b>91</b>       |
| Merit 57                       | 86         | 87         | 95          | 100        | 87           | <b>91</b>       |
| AC Metcalfe                    | 85         | 95         | 91          | 87         | 92           | <b>90</b>       |
| <b>Location Average (bu/A)</b> | <b>147</b> | <b>146</b> | <b>151</b>  | <b>131</b> | <b>55</b>    |                 |

**Chart 6. 2023 Spring Malt Barley Yield Percentage Across All Locations  
(Average=100%)**

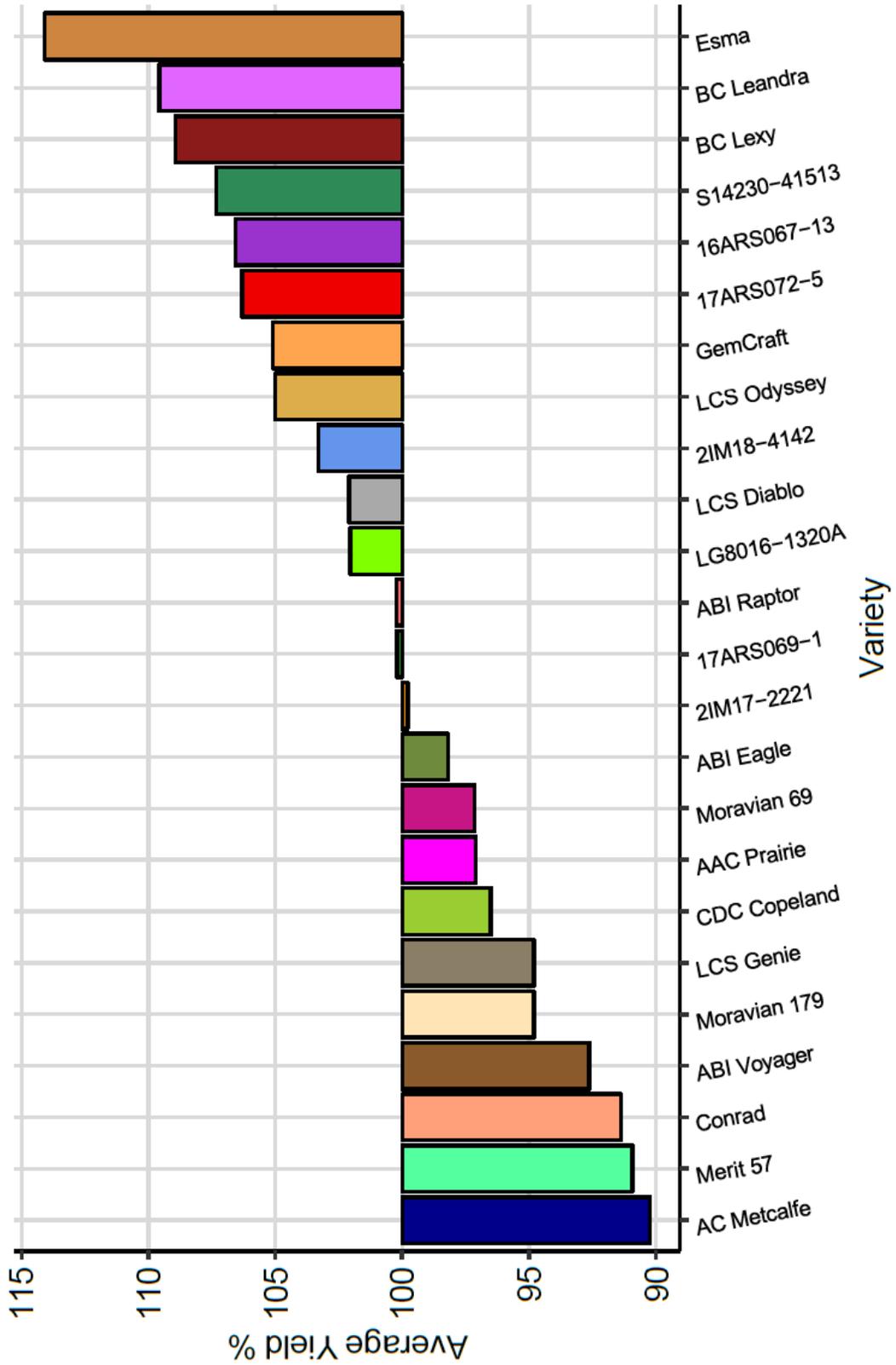


Table 53. 2-Row Spring Feed Barley Irrigated Nurseries, 3-Year Averages (2021-2023; 12 site-years)

| Variety or Selection                 | Yield (bu/A)* | Test Wt. (lb/bu) | Spring Stand (%) | Heading Date | Height (in.) | Lodging (%)  | Protein (%) | Plump (> 6/64) (5.5/64) | % Thin      |             |
|--------------------------------------|---------------|------------------|------------------|--------------|--------------|--------------|-------------|-------------------------|-------------|-------------|
| <b>2-Row Spring Feed Barley</b>      |               |                  |                  |              |              |              |             |                         |             |             |
| <b>HO516-429</b>                     | <b>148</b>    | 50.8             | 100              | 6/26         | 39           | 25           | 11.0        | 94.1                    | 3.8         | 2.6         |
| <b>Altorado</b>                      | <b>147</b>    | 51.6             | 100              | 6/26         | 37           | 14           | 11.2        | 93.4                    | 4.2         | 2.4         |
| <b>Claymore</b>                      | <b>144</b>    | 50.2             | 100              | 6/26         | 38           | 25           | 10.8        | 92.6                    | 4.7         | 2.9         |
| <b>Oreana</b>                        | <b>144</b>    | 50.3             | 100              | 6/28         | 32           | 27           | 10.9        | 90.4                    | 6.4         | 3.5         |
| Champion                             | 134           | 51.3             | 100              | 6/24         | 38           | 28           | 11.6        | 92.6                    | 4.8         | 2.9         |
| Idagold II                           | 128           | 50.5             | 100              | 6/25         | 36           | 24           | 11.4        | 92.1                    | 4.9         | 3.4         |
| Diamondback (SB6)                    | 109           | 44.8             | 100              | 6/24         | 28           | 12           | 11.8        | 85.4                    | 8.8         | 4.0         |
| <b>Feed Average</b>                  | <b>136</b>    | <b>49.9</b>      | <b>100</b>       | <b>6/25</b>  | <b>35</b>    | <b>22</b>    | <b>11.2</b> | <b>91.5</b>             | <b>5.4</b>  | <b>3.1</b>  |
| <b>2-Row Spring Food Barley</b>      |               |                  |                  |              |              |              |             |                         |             |             |
| Kardia                               | 128           | 49.5             | 100              | 6/29         | 38           | 32           | 11.2        | 89.8                    | 6.3         | 4.4         |
| Julie **                             | 103           | 56.9             | 98               | 6/29         | 37           | 11           | 13.6        | 89.1                    | 7.8         | 3.6         |
| Transit **                           | 89            | 53.0             | 99               | 6/28         | 40           | 18           | 14.8        | 78.2                    | 15.9        | 6.3         |
| Goldenhart**                         | 87            | 57.0             | 95               | 6/28         | 37           | 29           | 14.0        | 84.7                    | 10.1        | 5.7         |
| <b>Food Average</b>                  | <b>102</b>    | <b>54.1</b>      | <b>98</b>        | <b>6/28</b>  | <b>38</b>    | <b>23</b>    | <b>13.4</b> | <b>85.5</b>             | <b>10.0</b> | <b>5.0</b>  |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>7</b>      | <b>2</b>         | <b>1</b>         | <b>1</b>     | <b>1</b>     | <b>9</b>     | <b>1</b>    | <b>2</b>                | <b>2</b>    | <b>1</b>    |
| <b>CV (%)</b>                        | <b>13.9</b>   | <b>8.1</b>       | <b>2.6</b>       | <b>0.9</b>   | <b>6.5</b>   | <b>102.4</b> | <b>11.3</b> | <b>4.8</b>              | <b>37.2</b> | <b>37.7</b> |

\* Variety or selection in bold are not statistically different from the top yielding variety.

\*\* Indicates hullless variety.

SB6 = six-rowed barley

Table 54. 2-Row Spring Feed Barley Dryland Nurseries, 3-Year Averages (2021-2023; 3 site-years)

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Protein<br>(%) | Plump<br>(> 6/64)<br>(5.5/64) | % Thin      |             |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|-------------------------------|-------------|-------------|
| <b>2-Row Spring Feed Barley</b>      |                  |                     |                     |                 |                 |                |                               |             |             |
| <b>Idagold II</b>                    | <b>45</b>        | 51.0                | 100                 | 7/12            | 23              | 11.5           | 94.3                          | 4.6         | 1.8         |
| <b>HO516-429</b>                     | <b>45</b>        | 51.0                | 100                 | 7/11            | 25              | 11.4           | 93.8                          | 4.9         | 2.2         |
| <b>Champion</b>                      | <b>45</b>        | 52.0                | 100                 | 7/13            | 25              | 11.5           | 90.6                          | 7.3         | 2.7         |
| <b>Altorado</b>                      | <b>44</b>        | 50.0                | 100                 | 7/12            | 25              | 10.9           | 89.2                          | 8.6         | 2.6         |
| <b>Claymore</b>                      | <b>43</b>        | 50.0                | 98                  | 7/12            | 25              | 11.0           | 91.1                          | 6.7         | 2.5         |
| <b>Oreana</b>                        | <b>41</b>        | 51.0                | 98                  | 7/14            | 22              | 11.7           | 91.7                          | 6.1         | 2.9         |
| <b>Feed Average</b>                  | <b>44</b>        | <b>50.8</b>         | <b>99</b>           | <b>7/12</b>     | <b>24</b>       | <b>11.3</b>    | <b>91.8</b>                   | <b>6.4</b>  | <b>2.4</b>  |
| <b>2-Row Spring Food Barley</b>      |                  |                     |                     |                 |                 |                |                               |             |             |
| Kardia                               | 39               | 50.0                | 99                  | 7/15            | 24              | 13.1           | 94.9                          | 4.3         | 1.6         |
| Julie **                             | 27               | 55.0                | 90                  | 7/19            | 22              | 14.7           | 85.4                          | 11.6        | 3.6         |
| Goldenhart**                         | 27               | 56.0                | 82                  | 7/16            | 21              | \              | 73.8                          | 19.8        | 7.0         |
| Transit**                            | 26               | 55.0                | 98                  | 7/14            | 26              | 15.0           | 63.6                          | 28.6        | 8.2         |
| <b>Food Average</b>                  | <b>30</b>        | <b>54.0</b>         | <b>92</b>           | <b>7/16</b>     | <b>23</b>       | <b>14.3</b>    | <b>79.4</b>                   | <b>16.1</b> | <b>5.1</b>  |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>4</b>         | <b>2</b>            | <b>4</b>            | <b>1</b>        | <b>1</b>        | <b>1</b>       | <b>11</b>                     | <b>7</b>    | <b>4</b>    |
| <b>CV (%)</b>                        | <b>12.3</b>      | <b>4.3</b>          | <b>5.2</b>          | <b>0.8</b>      | <b>6.4</b>      | <b>5.0</b>     | <b>7.2</b>                    | <b>40.8</b> | <b>66.1</b> |

\* Variety or selection in bold are not statistically different from the top yielding variety.

\*\* Indicates hulless variety.

No lodging to report

Table 55. Irrigated 2-Row Spring Feed and Food Barley Data Combined from Aberdeen, Rupert, Idaho Falls and Tetonia, 2023.

| Variety or Selection                 | Yield<br>(bu/A)* | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | (> 6/64)    | Plump<br>(5.5/64) | % Thin      |
|--------------------------------------|------------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|-------------|-------------------|-------------|
| <b>2-Row Spring Feed Barley</b>      |                  |                     |                     |                 |                 |                |                |             |                   |             |
| <b>HO516-429</b>                     | <b>157</b>       | 50.3                | 100                 | 6/30            | 41              | 29             | 11.0           | 94.1        | 3.8               | 2.6         |
| <b>Altorado</b>                      | <b>155</b>       | 51.5                | 99                  | 6/29            | 39              | 19             | 11.2           | 93.4        | 4.2               | 2.4         |
| Claymore                             | 150              | 49.7                | 100                 | 6/29            | 39              | 31             | 10.8           | 92.6        | 4.7               | 2.9         |
| Oreana                               | 143              | 50.1                | 100                 | 7/1             | 33              | 25             | 10.9           | 90.4        | 6.4               | 3.5         |
| Champion                             | 142              | 50.9                | 100                 | 6/28            | 38              | 29             | 11.6           | 92.6        | 4.8               | 2.9         |
| Carleton                             | 139              | 49.7                | 99                  | 6/29            | 35              | 33             | ---            | ---         | ---               | ---         |
| Idagold II                           | 138              | 50.9                | 100                 | 6/28            | 37              | 25             | 11.4           | 92.1        | 4.9               | 3.4         |
| Diamondback (SB6)                    | 121              | 44.7                | 99                  | 6/27            | 29              | 16             | 11.8           | 85.4        | 8.8               | 4.0         |
| <b>Feed Average</b>                  | <b>143</b>       | <b>50</b>           | <b>100</b>          | <b>6/29</b>     | <b>36</b>       | <b>26</b>      | <b>11.2</b>    | <b>91.5</b> | <b>5.4</b>        | <b>3.1</b>  |
| <b>2-Row Spring Food Barley</b>      |                  |                     |                     |                 |                 |                |                |             |                   |             |
| <b>10ARS191-3</b>                    | <b>156</b>       | 50.4                | 100                 | 6/29            | 40              | 34             | ---            | ---         | ---               | ---         |
| Kardia                               | 140              | 49.1                | 100                 | 7/2             | 39              | 39             | 11.2           | 89.8        | 6.3               | 4.4         |
| Julie**                              | 105              | 58.4                | 99                  | 7/1             | 38              | 11             | 13.6           | 89.1        | 7.8               | 3.6         |
| Transit**                            | 101              | 56.8                | 98                  | 7/1             | 41              | 21             | 14.8           | 78.2        | 15.9              | 6.3         |
| 16ARS295-1                           | 98               | 56.1                | 97                  | 6/27            | 35              | 24             | ---            | ---         | ---               | ---         |
| Goldenhart**                         | 92               | 58.1                | 87                  | 7/2             | 38              | 20             | 14.0           | 84.7        | 10.1              | 5.7         |
| <b>Food Average</b>                  | <b>115</b>       | <b>55</b>           | <b>97</b>           | <b>6/30</b>     | <b>39</b>       | <b>25</b>      | <b>13.4</b>    | <b>85.5</b> | <b>10.0</b>       | <b>5.0</b>  |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>10</b>        | <b>1</b>            | <b>2</b>            | <b>1</b>        | <b>2</b>        | <b>16</b>      | <b>1</b>       | <b>3</b>    | <b>2</b>          | <b>1</b>    |
| <b>CV (%)</b>                        | <b>11.1</b>      | <b>1.4</b>          | <b>3.2</b>          | <b>0.80</b>     | <b>6.1</b>      | <b>91.1</b>    | <b>11.3</b>    | <b>4.8</b>  | <b>37.2</b>       | <b>37.7</b> |

\* Variety or selection in bold are not statistically different from the top yielding variety.

\*\* Indicates hullless variety.

SB6 = six-rowed barley

Table 56. Agronomic Data for Spring Feed and Food Barley, Rupert, Irrigated, 2023.

| Variety or Selection                 | Yield (Bu/A) |             |            | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |             |             |
|--------------------------------------|--------------|-------------|------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|-------------|-------------|-------------|
|                                      | 2021         | 2022        | 2023*      |                     |                     |                 |                 |                |                | (> 6/64)    | (5.5/64)    | % Thin      |
| <b>2-Row Spring Feed Barley</b>      |              |             |            |                     |                     |                 |                 |                |                |             |             |             |
| <b>10ARS191-3</b>                    | ---          | 125         | <b>174</b> | 51.0                | 100                 | 6/23            | 43              | 9              | 11.6           | 94.6        | 2.9         | 1.5         |
| <b>HO516-429</b>                     | 156          | 126         | <b>169</b> | 51.0                | 100                 | 6/24            | 43              | 23             | 11.3           | 95.3        | 2.5         | 1.4         |
| <b>Claymore</b>                      | 148          | 157         | <b>167</b> | 50.5                | 100                 | 6/21            | 41              | 15             | 10.5           | 97.0        | 1.5         | 1.2         |
| <b>Altorado</b>                      | 166          | 142         | <b>166</b> | 51.4                | 100                 | 6/21            | 41              | 10             | 11.9           | 93.1        | 3.6         | 1.7         |
| <b>Oreana</b>                        | 155          | 152         | <b>159</b> | 50.6                | 100                 | 6/25            | 35              | 11             | 11.1           | 95.8        | 2.7         | 0.8         |
| <b>Champion</b>                      | 131          | 120         | <b>159</b> | 50.5                | 100                 | 6/22            | 41              | 12             | 12.3           | 96.1        | 2.5         | 1.2         |
| Carleton                             | ---          | ---         | 155        | 50.4                | 100                 | 6/24            | 36              | 8              | 10.2           | 94.9        | 2.9         | 1.4         |
| Idagold II                           | 133          | 128         | 152        | 51.2                | 100                 | 6/20            | 38              | 18             | 11.2           | 98.1        | 1.3         | 0.7         |
| Diamondback (SB6)                    | 140          | 101         | 142        | 45.3                | 100                 | 6/20            | 31              | 10             | 11.1           | 92.0        | 5.4         | 2.4         |
| <b>Feed Average</b>                  | <b>140</b>   | <b>127</b>  | <b>160</b> | <b>50</b>           | <b>100</b>          | <b>6/22</b>     | <b>39</b>       | <b>13</b>      | <b>11.2</b>    | <b>95.2</b> | <b>2.8</b>  | <b>1.4</b>  |
| <b>2-Row Spring Food Barley</b>      |              |             |            |                     |                     |                 |                 |                |                |             |             |             |
| <b>Kardia</b>                        | 132          | 98          | <b>160</b> | 49.5                | 100                 | 6/26            | 42              | 28             | 10.7           | 94.2        | 3.4         | 2.1         |
| HO517-126**                          | ---          | 107         | 128        | 57.7                | 99                  | 6/22            | 36              | 0              | 12.3           | 83.3        | 13.1        | 2.9         |
| Julie**                              | 109          | 80          | 108        | 58.0                | 99                  | 6/25            | 40              | 10             | 12.6           | 93.6        | 4.3         | 1.8         |
| PlanetMax3.16**                      | ---          | ---         | 106        | 54.6                | 99                  | 6/25            | 32              | 9              | 12.0           | 2.8         | 34.5        | 62.0        |
| 16ARS295-1**                         | ---          | ---         | 106        | 56.2                | 99                  | 6/26            | 34              | 11             | 13.6           | 82.3        | 10.9        | 6.1         |
| Transit **                           | 94           | 80          | 106        | 54.3                | 96                  | 6/22            | 44              | 11             | 12.5           | 84.4        | 12.3        | 3.0         |
| PlanetMax3.6**                       | ---          | ---         | 100        | 54.9                | 97                  | 6/25            | 32              | 8              | 12.0           | 3.8         | 38.3        | 57.4        |
| Goldenhart**                         | 90           | 62          | 93         | 57.3                | 90                  | 6/25            | 38              | 31             | 14.2           | 90.5        | 6.7         | 2.7         |
| MerlinMax3.19**                      | ---          | ---         | 85         | 54.5                | 91                  | 6/29            | 28              | 8              | 14.3           | 0.3         | 4.4         | 95.4        |
| MerlinMax3.18**                      | ---          | ---         | 82         | 54.3                | 83                  | 6/25            | 28              | 7              | 14.0           | 0.5         | 4.0         | 95.1        |
| MerlinMax3.6**                       | ---          | ---         | 74         | 52.0                | 91                  | 6/28            | 24              | 7              | 13.8           | 1.1         | 2.5         | 96.1        |
| <b>Food Average</b>                  | <b>106</b>   | <b>80</b>   | <b>104</b> | <b>54.8</b>         | <b>95</b>           | <b>6/25</b>     | <b>35</b>       | <b>12</b>      | <b>12.9</b>    | <b>48.8</b> | <b>12.2</b> | <b>38.6</b> |
| <b>LSD (<math>\alpha=.05</math>)</b> | <b>26</b>    | <b>23</b>   | <b>16</b>  | <b>1</b>            | <b>3</b>            | <b>3</b>        | <b>3</b>        | <b>22</b>      | <b>---</b>     | <b>---</b>  | <b>---</b>  | <b>---</b>  |
| <b>CV (%)</b>                        | <b>13.2</b>  | <b>12.8</b> | <b>9.0</b> | <b>1.0</b>          | <b>2.5</b>          | <b>1.2</b>      | <b>5.5</b>      | <b>128.7</b>   | <b>---</b>     | <b>---</b>  | <b>---</b>  | <b>---</b>  |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates hullless variety.

SB6 = six-rowed barley.

Table 57. Agronomic Data for Spring Feed and Food Barley, Aberdeen, Irrigated, 2023.

| Variety or Selection                | Yield (Bu/A) |            |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump<br>(5.5/64) | % Thin      |             |
|-------------------------------------|--------------|------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|-------------------|-------------|-------------|
|                                     | 2021         | 2022       | 2023*       |                     |                     |                 |                 |                |                |                   |             |             |
| <b>2-Row Spring Feed Barley</b>     |              |            |             |                     |                     |                 |                 |                |                |                   |             |             |
| Altorado                            | 155          | 140        | <b>176</b>  | 51.5                | 98                  | 6/19            | 43              | 36             | 12.9           | 96.8              | 2.0         | 0.9         |
| 10ARS191-3                          | ---          | 132        | <b>173</b>  | 49.2                | 100                 | 6/21            | 44              | 73             | 12.9           | 96.8              | 2.0         | 0.9         |
| HO516-429                           | 163          | 139        | <b>173</b>  | 49.6                | 99                  | 6/22            | 45              | 60             | 13.9           | 94.3              | 3.1         | 2.8         |
| Oreana                              | 147          | 147        | <b>170</b>  | 49.5                | 98                  | 6/24            | 37              | 43             | 13.7           | 94.4              | 3.8         | 2.4         |
| Carleton                            | ---          | ---        | <b>164</b>  | 50.5                | 97                  | 6/21            | 39              | 40             | 13.4           | 92.8              | 4.8         | 2.3         |
| Champion                            | 140          | 120        | <b>162</b>  | 50.7                | 99                  | 6/19            | 41              | 70             | 12.3           | 93.0              | 5.5         | 2.1         |
| Idagold II                          | 134          | 133        | <b>159</b>  | 51.0                | 100                 | 6/21            | 41              | 15             | 14.0           | 91.6              | 4.7         | 3.3         |
| Claymore                            | 152          | 140        | 157         | 49.1                | 100                 | 6/20            | 42              | 64             | 13.8           | 95.0              | 3.1         | 1.9         |
| Diamondback (SB6)                   | 138          | 122        | 124         | 44.9                | 98                  | 6/19            | 29              | 0              | 13.8           | 88.6              | 8.0         | 3.1         |
| <b>Feed Average</b>                 | <b>142</b>   | <b>131</b> | <b>162</b>  | <b>49.5</b>         | <b>99</b>           | <b>6/21</b>     | <b>40</b>       | <b>44</b>      | <b>13.4</b>    | <b>93.7</b>       | <b>4.1</b>  | <b>2.2</b>  |
| <b>2-Row Spring Food Barley</b>     |              |            |             |                     |                     |                 |                 |                |                |                   |             |             |
| Kardia                              | 128          | 122        | 139         | 48.0                | 98                  | 6/26            | 42              | 63             | 14.1           | 87.7              | 7.8         | 4.6         |
| HO517-126**                         | ---          | 96         | 133         | 59.6                | 99                  | 6/19            | 40              | 15             | 13.8           | 89.5              | 7.3         | 3.6         |
| Julie**                             | 92           | 85         | 110         | 58.1                | 98                  | 6/27            | 43              | 8              | 14.5           | 91.6              | 5.9         | 2.6         |
| PlanetMax3.13**                     | ---          | ---        | 109         | 54.6                | 97                  | 6/24            | 37              | 1              | 13.0           | 3.9               | 33.4        | 62.4        |
| PlanetMax3.6**                      | ---          | ---        | 108         | 55.5                | 95                  | 6/25            | 37              | 0              | 13.0           | 5.1               | 44.6        | 50.1        |
| PlanetMax3.16**                     | ---          | ---        | 106         | 54.9                | 95                  | 6/27            | 37              | 1              | 12.5           | 6.4               | 42.8        | 50.9        |
| LaureateMax3.8**                    | ---          | ---        | 106         | 54.6                | 66                  | 6/29            | 38              | 0              | 12.8           | 8.0               | 43.8        | 48.6        |
| 16ARS295-1**                        | ---          | ---        | 104         | 57.0                | 94                  | 6/17            | 39              | 14             | 14.7           | 87.7              | 7.6         | 5.4         |
| Goldenhart**                        | 101          | 81         | 98          | 57.5                | 69                  | 6/25            | 41              | 18             | 15.8           | 86.9              | 7.8         | 4.8         |
| Transit **                          | 95           | 94         | 98          | 56.3                | 95                  | 6/25            | 44              | 45             | 15.2           | 82.6              | 12.8        | 4.8         |
| MerlinMax3.19**                     | ---          | ---        | 94          | 54.4                | 56                  | 6/29            | 33              | 1              | 15.0           | 0.3               | 9.6         | 90.7        |
| MerlinMax3.18**                     | ---          | ---        | 91          | 54.0                | 55                  | 6/29            | 33              | 0              | 14.8           | 0.4               | 8.7         | 91.4        |
| MerlinMax3.6**                      | ---          | ---        | 83          | 52.7                | 64                  | 6/29            | 31              | 0              | 15.3           | 1.9               | 10.2        | 88          |
| MerlinMax3.11**                     | ---          | ---        | 82          | 52.9                | 66                  | 6/29            | 33              | 0              | 15.6           | 0.4               | 10.4        | 88.7        |
| MerlinMax3.3**                      | ---          | ---        | 81          | 52.7                | 49                  | 6/30            | 31              | 0              | 15.6           | 0.7               | 9.4         | 90.1        |
| PlanetMax3.3**                      | ---          | ---        | 68          | 39.1                | 82                  | 6/24            | 35              | 0              | 13.1           | 16.2              | 44.5        | 38.9        |
| <b>Food Average</b>                 | <b>102</b>   | <b>97</b>  | <b>101</b>  | <b>53.9</b>         | <b>80</b>           | <b>6/26</b>     | <b>37</b>       | <b>10</b>      | <b>14.3</b>    | <b>35.6</b>       | <b>19.2</b> | <b>45.4</b> |
| <b>LSD (<math>\alpha=05</math>)</b> | <b>23</b>    | <b>18</b>  | <b>18</b>   | <b>9</b>            | <b>14</b>           | <b>3</b>        | <b>3</b>        | <b>25</b>      | ---            | ---               | ---         | ---         |
| <b>CV (%)</b>                       | <b>10.3</b>  | <b>10</b>  | <b>10.4</b> | <b>12.3</b>         | <b>11.1</b>         | <b>1.1</b>      | <b>5.7</b>      | <b>77.3</b>    | ---            | ---               | ---         | ---         |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates hullless variety.

SB6 = six-rowed barley.

Table 58. Agronomic Data for Spring Feed and Food Barley at Idaho Falls, Irrigated, 2023.

| Variety or Selection                  | Yield (Bu/A) |            |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump<br>(> 6/64)<br>(5.5/64) | % Thin      |            |
|---------------------------------------|--------------|------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|-------------------------------|-------------|------------|
|                                       | 2021         | 2022       | 2023*       |                     |                     |                 |                 |                |                |                               |             |            |
| <b>2-Row Spring Feed Barley</b>       |              |            |             |                     |                     |                 |                 |                |                |                               |             |            |
| <b>HO516-429</b>                      | 130          | 128        | <b>165</b>  | 50.3                | 100                 | 6/28            | 39              | 24             | 11.7           | 93.2                          | 3.9         | 2.6        |
| <b>Altorado</b>                       | 107          | 154        | <b>162</b>  | 52.3                | 100                 | 6/30            | 36              | 31             | 12             | 93.1                          | 3.7         | 3.2        |
| <b>Claymore</b>                       | 129          | 138        | <b>162</b>  | 49.8                | 100                 | 6/28            | 39              | 36             | 12             | 91.8                          | 5.2         | 3.2        |
| <b>10ARS191-3</b>                     |              | 121        | <b>158</b>  | 50.9                | 100                 | 6/28            | 40              | 46             | 12             | 91.9                          | 4.7         | 3.8        |
| <b>Champion</b>                       | 117          | 133        | <b>157</b>  | 52.0                | 100                 | 6/27            | 38              | 33             | 12.5           | 94.6                          | 3.4         | 1.8        |
| Idagold II                            | 100          | 125        | 133         | 50.8                | 100                 | 6/25            | 36              | 68             | 13             | 92.1                          | 5.0         | 3.5        |
| Carleton                              | ---          | ---        | 133         | 48.9                | 100                 | 6/25            | 37              | 84             | 12             | 79.2                          | 11.6        | 9.2        |
| Diamondback (SB6)                     | 37           | 133        | 132         | 45.2                | 100                 | 6/25            | 29              | 68             | 13             | 65.5                          | 6.7         | 2.5        |
| Oreana                                | 141          | 135        | 126         | 50.0                | 100                 | 6/29            | 31              | 46             | 11.8           | 88.5                          | 6.5         | 4.6        |
| <b>Feed Average</b>                   | <b>104</b>   | <b>131</b> | <b>147</b>  | <b>50.0</b>         | <b>100</b>          | <b>6/27</b>     | <b>36</b>       | <b>48</b>      | <b>12.4</b>    | <b>87.8</b>                   | <b>5.6</b>  | <b>3.8</b> |
| <b>2-Row Spring Food Barley</b>       |              |            |             |                     |                     |                 |                 |                |                |                               |             |            |
| HO517-126**                           | ---          | ---        | 138         | 59.1                | 100                 | 6/26            | 35              | 39             | 12.7           | 76.8                          | 14.5        | 8.8        |
| Kardia                                | 115          | 113        | 138         | 48.9                | 100                 | 7/2             | 38              | 65             | 12.6           | 86.7                          | 7.6         | 5.6        |
| Julie**                               | 95           | 82         | 122         | 58.7                | 100                 | 7/3             | 38              | 28             | 15.0           | 89.1                          | 8.3         | 3.4        |
| Transit **                            | 71           | 76         | 118         | 56.8                | 100                 | 6/28            | 39              | 27             | 16.8           | 80.6                          | 13.5        | 5.8        |
| 16ARS295-1**                          | ---          | ---        | 112         | 56.2                | 100                 | 6/24            | 35              | 70             | 13.5           | 79.8                          | 11.5        | 8.8        |
| Goldenhart**                          | 86           | 80         | 100         | 58.6                | 100                 | 6/30            | 38              | 33             | 14.2           | 89.6                          | 8.3         | 2.4        |
| <b>Food Average</b>                   | <b>92</b>    | <b>91</b>  | <b>121</b>  | <b>56.4</b>         | <b>100</b>          | <b>6/29</b>     | <b>37</b>       | <b>44</b>      | <b>14.1</b>    | <b>83.8</b>                   | <b>10.6</b> | <b>5.8</b> |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>28</b>    | <b>15</b>  | <b>24</b>   | <b>1</b>            | <b>NS</b>           | <b>2</b>        | <b>3</b>        | <b>51</b>      | <b>---</b>     | <b>---</b>                    | <b>---</b>  | <b>---</b> |
| <b>CV (%)</b>                         | <b>19.7</b>  | <b>8.6</b> | <b>12.4</b> | <b>1.7</b>          | <b>0.0</b>          | <b>0.7</b>      | <b>5.2</b>      | <b>76.0</b>    | <b>---</b>     | <b>---</b>                    | <b>---</b>  | <b>---</b> |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates hullless variety.

SB6 = six-rowed barley.

Table 59. Agronomic Data for Spring Feed and Food Barley at Tetonia, Irrigated, 2023.

| Variety or Selection                  | Yield (Bu/A) |            |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |            |            |
|---------------------------------------|--------------|------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|-------------|------------|------------|
|                                       | 2021*        | 2022       | 2023**      |                     |                     |                 |                 |                |                | (> 6/64)    | (5.5/64)   | % Thin     |
| <b>2-Row Spring Feed Barley</b>       |              |            |             |                     |                     |                 |                 |                |                |             |            |            |
| <b>HO516-429</b>                      | 131          | <b>164</b> | <b>122</b>  | 50.5                | 100                 | 7/15            | 37              | 10             | 10.8           | 97.5        | 1.5        | 1.2        |
| <b>10ARS191-3</b>                     | ---          | <b>159</b> | <b>118</b>  | 50.6                | 100                 | 7/15            | 34              | 10             | 11.0           | 96.1        | 2.6        | 1.3        |
| <b>Oreana</b>                         | 119          | <b>166</b> | <b>115</b>  | 50.2                | 100                 | 7/16            | 31              | 0              | 10.4           | 95.4        | 2.9        | 1.7        |
| <b>Altorado</b>                       | 125          | 148        | <b>114</b>  | 50.8                | 100                 | 7/15            | 34              | 0              | 10.4           | 94.3        | 2.8        | 2.3        |
| <b>Claymore</b>                       | 131          | 152        | <b>114</b>  | 49.3                | 100                 | 7/15            | 35              | 9              | 9.8            | 94.4        | 3.6        | 1.9        |
| <b>Idagold II</b>                     | 114          | 148        | <b>108</b>  | 50.6                | 100                 | 7/15            | 34              | 1              | 10.7           | 97.3        | 1.3        | 1.1        |
| <b>Carleton</b>                       | ---          | ---        | <b>104</b>  | 49.2                | 100                 | 7/15            | 30              | 0              | 8.7            | 94.2        | 4.1        | 1.6        |
| Champion                              | 133          | 147        | 92          | 50.5                | 100                 | 7/15            | 33              | 0              | 10.0           | 92.6        | 4.4        | 2.6        |
| Diamondback (SB6)                     | 69           | 126        | 86          | 43.4                | 100                 | 7/14            | 30              | 0              | 10.9           | 95.5        | 3          | 1.2        |
| <b>Feed Average</b>                   | <b>113</b>   | <b>147</b> | <b>108</b>  | <b>49.4</b>         | <b>100</b>          | <b>7/15</b>     | <b>33</b>       | <b>3</b>       | <b>10.3</b>    | <b>95.3</b> | <b>2.9</b> | <b>1.7</b> |
| <b>2-Row Spring Food Barley</b>       |              |            |             |                     |                     |                 |                 |                |                |             |            |            |
| <b>Kardia</b>                         | 132          | 142        | <b>122</b>  | 50.0                | 100                 | 7/16            | 37              | 2              | 11.8           | 95.0        | 2.8        | 2          |
| Transit***                            | 79           | 100        | 83          | 57.9                | 100                 | 7/16            | 39              | 1              | 13.3           | 88.3        | 8.6        | 3          |
| Julie***                              | 86           | 99         | 81          | 58.9                | 100                 | 4/24            | 16              | 0              | 11.0           | 85.7        | 10         | 4.2        |
| Goldenhart***                         | 91           | 98         | 78          | 58.8                | 90                  | 7/17            | 35              | 0              | 12.0           | 81.2        | 13.5       | 5.1        |
| 16ARS295-1***                         | ---          | ---        | 71          | 57.1                | 100                 | 7/15            | 31              | 0              | 12.8           | 86.0        | 10.3       | 3.8        |
| <b>Food Average</b>                   | <b>98</b>    | <b>112</b> | <b>87</b>   | <b>56.5</b>         | <b>98</b>           | <b>6/29</b>     | <b>32</b>       | <b>1</b>       | <b>12.2</b>    | <b>87.2</b> | <b>9.0</b> | <b>3.6</b> |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>21</b>    | <b>13</b>  | <b>23</b>   | <b>1.0</b>          | <b>NS</b>           | <b>39</b>       | <b>8</b>        | <b>NS</b>      | <b>---</b>     | <b>---</b>  | <b>---</b> | <b>---</b> |
| <b>CV (%)</b>                         | <b>12.7</b>  | <b>6.7</b> | <b>15.8</b> | <b>1.43</b>         | <b>0</b>            | <b>14.0</b>     | <b>17.2</b>     | <b>330.5</b>   | <b>---</b>     | <b>---</b>  | <b>---</b> | <b>---</b> |

\* The trial location in 2021 was in Ashton.

\*\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\*\* Indicates hullless variety.

SB6 = six-rowed barley.

Table 60. Agronomic Data for Spring Feed and Food Barley at Soda Springs, Dryland, 2023

| Variety or Selection                  | Yield (Bu/A) |             |             | Test Wt.<br>(lb/bu) | Spring<br>Stand (%) | Heading<br>Date | Height<br>(in.) | Lodging<br>(%) | Protein<br>(%) | Plump       |             |             |
|---------------------------------------|--------------|-------------|-------------|---------------------|---------------------|-----------------|-----------------|----------------|----------------|-------------|-------------|-------------|
|                                       | 2021         | 2022        | 2023*       |                     |                     |                 |                 |                |                | (> 6/64)    | (5.5/64)    | % Thin      |
| <b>2-Row Spring Feed Barley</b>       |              |             |             |                     |                     |                 |                 |                |                |             |             |             |
| <b>10ARS191-3</b>                     | ---          | 45          | <b>68</b>   | 48.9                | 100                 | 7/15            | 32              | 0              | 11.8           | 98.3        | 1.9         | 0.7         |
| <b>Carleton</b>                       | ---          | ---         | <b>65</b>   | 47.8                | 100                 | 7/14            | 29              | 0              | 11.0           | 92.3        | 7.0         | 1.9         |
| <b>HO516-429</b>                      | 27           | 49          | <b>60</b>   | 49.1                | 100                 | 7/16            | 32              | 0              | 12.3           | 98.6        | 1.3         | 1.2         |
| <b>Oreana</b>                         | 19           | 47          | <b>59</b>   | 49.6                | 98                  | 7/18            | 28              | 0              | 12.6           | 99.1        | 1.1         | 0.5         |
| Altorado                              | 28           | 47          | 58          | 50.5                | 100                 | 7/15            | 31              | 0              | 11.0           | 98.4        | 1.2         | 0.4         |
| Claymore                              | 20           | 53          | 56          | 48.4                | 100                 | 7/16            | 30              | 0              | 11.5           | 97.3        | 1.6         | 1.0         |
| Champion                              | 26           | 54          | 56          | 50.2                | 100                 | 7/15            | 31              | 0              | 12.2           | 98.0        | 1.2         | 0.7         |
| Idagold II                            | 25           | 51          | 55          | 49.9                | 100                 | 7/16            | 29              | 0              | 12.4           | 99.0        | 1.2         | 0.5         |
| <b>Feed Average</b>                   | <b>20</b>    | <b>48</b>   | <b>59</b>   | <b>49.3</b>         | <b>100</b>          | <b>7/15</b>     | <b>30</b>       | <b>0</b>       | <b>11.9</b>    | <b>97.6</b> | <b>2.1</b>  | <b>0.9</b>  |
| <b>2-Row Spring Food Barley</b>       |              |             |             |                     |                     |                 |                 |                |                |             |             |             |
| Kardia                                | 18           | 37          | 58          | 48.7                | 100                 | 7/18            | 31              | 0              | 13.2           | 98          | 2           | 1           |
| 16ARS295-1**                          | ---          | ---         | 51          | 56.5                | 96                  | 7/11            | 28              | 0              | 15.3           | 89          | 10          | 2           |
| Julie **                              | 11           | 29          | 43          | 57.0                | 91                  | 7/22            | 27              | 0              | 16.0           | 89.1        | 8.6         | 2.6         |
| Transit **                            | 11           | 30          | 38          | 56.2                | 99                  | 7/19            | 31              | 0              | 16.7           | 75.4        | 21.3        | 3.2         |
| PlanetMax3.16                         | ---          | ---         | 36          | 55.6                | 98                  | 7/18            | 27              | 0              | 14             | 1.7         | 17.4        | 81.4        |
| Goldenhart**                          | 14           | 36          | 31          | 57.6                | 71                  | 7/20            | 26              | 0              | 16.7           | 89.6        | 7.4         | 3.1         |
| <b>Food Average</b>                   | <b>14</b>    | <b>35</b>   | <b>43</b>   | <b>55.3</b>         | <b>93</b>           | <b>7/18</b>     | <b>28</b>       | <b>0</b>       | <b>15.3</b>    | <b>73.8</b> | <b>11.0</b> | <b>15.6</b> |
| <b>LSD (<math>\alpha=0.05</math>)</b> | <b>5</b>     | <b>9</b>    | <b>9</b>    | <b>1.1</b>          | <b>10</b>           | <b>2</b>        | <b>2</b>        | <b>0</b>       | ---            | ---         | ---         | ---         |
| <b>CV (%)</b>                         | <b>19.1</b>  | <b>14.0</b> | <b>12.2</b> | <b>1.4</b>          | <b>6.8</b>          | <b>0.5</b>      | <b>5.8</b>      | ---            | ---            | ---         | ---         | ---         |

\* Varieties or selections in bold are not statistically different from the top yielding variety.

\*\* Indicates hullless variety.

No lodging to report.

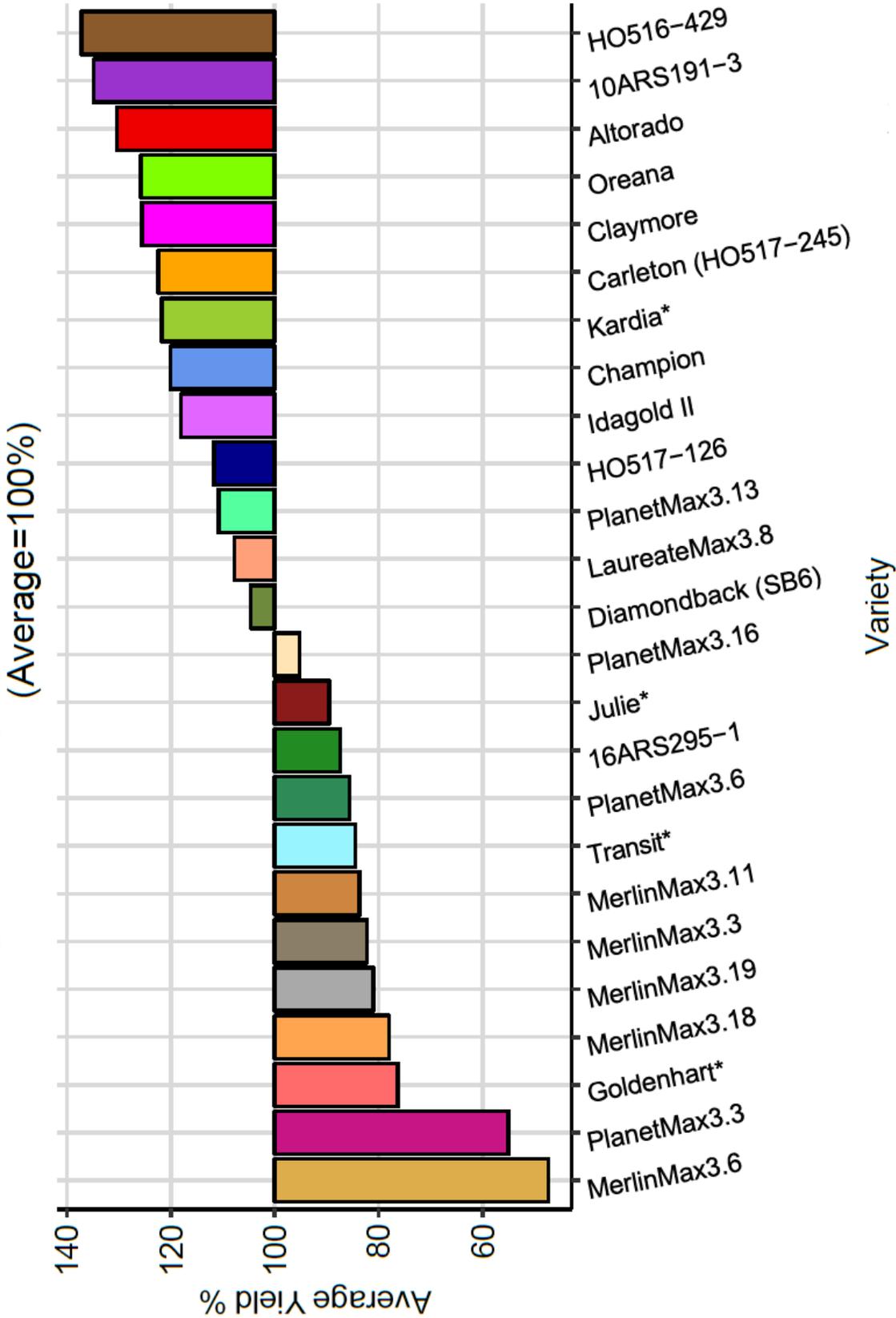
**Table 61. 2-Row Spring Feed and Food Barley Yield Percentage of Location Averages, 2023.**

| Variety or Selection           | (100% = Average) |            |             |            |              | Variety average |
|--------------------------------|------------------|------------|-------------|------------|--------------|-----------------|
|                                | Aberdeen         | Rupert     | Idaho Falls | Tetonia    | Soda Springs |                 |
| <b>Feed Barley</b>             |                  |            |             |            |              |                 |
| HO516-429                      | 177              | 130        | 121         | 121        | ---          | 137             |
| 10ARS191-3                     | 177              | 134        | 116         | 118        | 130          | 135             |
| Altorado                       | 180              | 128        | 119         | 113        | 112          | 130             |
| Oreana                         | 173              | 123        | 92          | 115        | ---          | 126             |
| Claymore                       | 160              | 129        | 119         | 113        | 107          | 126             |
| Carleton                       | 168              | 120        | 97          | 104        | 124          | 122             |
| Champion                       | 165              | 123        | 115         | 91         | 107          | 120             |
| Idagold II                     | 163              | 118        | 97          | 107        | 106          | 118             |
| Diamondback (SB6)              | 127              | 110        | 96          | 86         | ---          | 105             |
| <b>Location Average (bu/A)</b> | <b>157</b>       | <b>120</b> | <b>145</b>  | <b>105</b> | <b>58</b>    |                 |
| <b>Food Barley</b>             |                  |            |             |            |              |                 |
| Kardia                         | 142              | 123        | 101         | 121        | ---          | 122             |
| HO517-126*                     | 135              | 99         | 101         | ---        | ---          | 112             |
| PlanetMax3.13*                 | 111              | ---        | ---         | ---        | ---          | 111             |
| LaureateMax3.8*                | 108              | ---        | ---         | ---        | ---          | 108             |
| PlanetMax3.16*                 | 108              | 82         | ---         | ---        | ---          | 95              |
| Julie*                         | 112              | 84         | 89          | 81         | 82           | 90              |
| 16ARS295-1                     | 106              | 81         | 82          | 71         | 97           | 87              |
| PlanetMax3.6*                  | 110              | 77         | ---         | ---        | 69           | 86              |
| Transit*                       | 100              | 81         | 86          | 82         | 72           | 84              |
| MerlinMax3.11*                 | 84               | ---        | ---         | ---        | ---          | 84              |
| MerlinMax3.3*                  | 82               | ---        | ---         | ---        | ---          | 82              |
| MerlinMax3.19*                 | 96               | 66         | ---         | ---        | ---          | 81              |
| MerlinMax3.18*                 | 93               | 63         | ---         | ---        | ---          | 78              |
| Goldenhart*                    | 100              | 72         | 73          | 78         | 58           | 76              |
| PlanetMax3.3*                  | 55               | ---        | ---         | ---        | ---          | 55              |
| MerlinMax3.6*                  | 85               | 57         | ---         | ---        | 0            | 47              |
| <b>Location Average (bu/A)</b> | <b>100</b>       | <b>104</b> | <b>121</b>  | <b>88</b>  | <b>43</b>    |                 |

\* Indicates hullless varieties.

SB6 = Six-rowed barley

Chart 7. 2023 Spring Food Barley Yield Percentage Across All Locations



**Table 62. Grain Protein & Kernel Hardness of Hard Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2021-22.**

| Variety or Selector     | -----Grain Protein %----- |             |             |             |             |             |             | -----Kernel Hardness 0-100----- |           |             |             |             |             |           |
|-------------------------|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------------------|-----------|-------------|-------------|-------------|-------------|-----------|
|                         | Aberdeen                  | Kimberly    | Rupert      | Ririe Irrig | Rockland    | Joda Spring | Average     | Aberdeen                        | Kimberly  | Rupert      | Ririe Irrig | Rockland    | Joda Spring | Average   |
| Balance                 | 19.8                      | 14.5        | 15.6        | 15.2        | 13.5        | 11.9        | <b>15.1</b> | 119                             | 87        | 99          | 92          | 64          | 46          | <b>84</b> |
| Flathead                | 16.3                      | 13.1        | 14.1        | 13.2        | 12.2        | 10.8        | <b>13.3</b> | 95                              | 106       | 107         | 109         | 69          | 45          | <b>88</b> |
| FourOsix                | 14.3                      | 13.4        | 14.9        | 13.8        | 12.5        | 10.6        | <b>13.2</b> | 95                              | 90        | 101         | 91          | 57          | 24          | <b>76</b> |
| Juniper                 | ---                       | ---         | ---         | ---         | 13.0        | 10.9        | <b>12.0</b> | ---                             | ---       | ---         | ---         | 71          | 49          | <b>60</b> |
| Kairos                  | 14.3                      | 13.0        | 13.9        |             |             |             | <b>13.7</b> | 76                              | 89        | 94          | ---         | ---         | ---         | <b>86</b> |
| Keldin                  | 15.7                      | 12.9        | 15.7        | 13.4        | 11.1        | 10.8        | <b>13.3</b> | 84                              | 90        | 98          | 87          | 57          | 40          | <b>76</b> |
| Keldin + 11-52-0        | 17.1                      | 13.1        | 14.9        | 13.6        | 11.6        | 11.0        | <b>13.6</b> | 82                              | 78        | 98          | 82          | 49          | 33          | <b>70</b> |
| LCS Jet                 | 14.9                      | 13.6        | 14.4        | 14.2        | 12.0        | 10.5        | <b>13.3</b> | 83                              | 92        | 96          | 87          | 55          | 31          | <b>74</b> |
| LCS Rocket              | 14.9                      | 13.2        | 13.9        | 13.6        | ---         | ---         | <b>13.9</b> | 93                              | 83        | 98          | 86          | ---         | ---         | <b>90</b> |
| Milestone               | 14.6                      | 13.8        | 14.2        | 13.6        | ---         | ---         | <b>14.1</b> | 91                              | 84        | 95          | 91          | ---         | ---         | <b>90</b> |
| MT1745                  | 15.3                      | 13.1        | 14.5        | 13.5        | 11.7        | 10.8        | <b>13.1</b> | 103                             | 93        | 98          | 95          | 65          | 36          | <b>82</b> |
| OR2170199R              | 15.2                      | 13.5        | 15.0        | 14.0        | 13.5        | 10.8        | <b>13.7</b> | 87                              | 92        | 83          | 89          | 68          | 39          | <b>76</b> |
| Promontory              | ---                       | ---         | ---         | ---         | 13.0        | 12.0        | <b>12.5</b> | ---                             | ---       | ---         | ---         | 81          | 54          | <b>68</b> |
| Scorpio                 | 15.3                      | 14.1        | 13.8        | 14.1        | 12.5        | 11.1        | <b>13.5</b> | 92                              | 96        | 93          | 89          | 61          | 36          | <b>78</b> |
| Sequoia                 | ---                       | ---         | ---         | ---         | 11.9        | 11.0        | <b>11.5</b> | ---                             | ---       | ---         | ---         | 54          | 32          | <b>43</b> |
| UI Silver               | ---                       | ---         | ---         | ---         | 12.7        | 10.6        | <b>11.6</b> | ---                             | ---       | ---         | ---         | 79          | 37          | <b>58</b> |
| UI SRG                  | ---                       | ---         | ---         | ---         | 12.7        | 11.4        | <b>12.0</b> | ---                             | ---       | ---         | ---         | 71          | 43          | <b>57</b> |
| WA8309                  | 14.3                      | 13.3        | 15.3        | 13.8        | 13.1        | 10.8        | <b>13.5</b> | 126                             | 83        | 87          | 84          | 62          | 28          | <b>78</b> |
| WB4401                  | 16.1                      | 12.8        | 14.2        | 13.6        | 12.3        | 11.2        | <b>13.4</b> | 91                              | 118       | 114         | 115         | 88          | 40          | <b>94</b> |
| WB4510CLP               | 15.3                      | 13.2        | 13.9        | 13.8        | 12.4        | 10.7        | <b>13.2</b> | 98                              | 90        | 88          | 89          | 68          | 43          | <b>79</b> |
| Yellowstone             | 16.0                      | 13.3        | 15.4        | 14.3        | 11.7        | 10.9        | <b>13.6</b> | 113                             | 107       | 102         | 96          | 67          | 35          | <b>87</b> |
| Variety or Selector     | -----Grain Protein %----- |             |             |             |             |             |             | -----Kernel Hardness 0-100----- |           |             |             |             |             |           |
| Aberdeen                | Kimberly                  | Rupert      | Ririe Irrig | Rockland    | Joda Spring | Average     | Aberdeen    | Kimberly                        | Rupert    | Ririe Irrig | Rockland    | Joda Spring | Average     |           |
| IDO1906 (W)             | 16.4                      | 14.2        | 15.7        | 15.1        | 12.3        | 11.3        | <b>14.2</b> | 87                              | 88        | 88          | 84          | 65          | 37          | <b>75</b> |
| IDO2006 (W)             | 15.0                      | 13.4        | 15.3        | 13.5        | 12.6        | 10.6        | <b>13.4</b> | 110                             | 78        | 92          | 86          | 55          | 34          | <b>76</b> |
| Millie (W)              | 16.2                      | 14.1        | 16.6        | 14.6        | 12.6        | 11.6        | <b>14.3</b> | 92                              | 90        | 111         | 83          | 50          | 36          | <b>77</b> |
| OR2170052H (W)          | 15.7                      | 13.2        | 14.8        | 13.9        | 13.2        | 10.2        | <b>13.5</b> | 110                             | 115       | 109         | 95          | 57          | 30          | <b>86</b> |
| UI Bronze Jade (W)      | 14.7                      | 13.1        | 14.6        | 14.3        | 12.9        | 11.0        | <b>13.4</b> | 92                              | 90        | 101         | 102         | 74          | 34          | <b>82</b> |
| Golden Spike (W)        | ---                       | ---         | ---         | ---         | 12.6        | 10.5        | <b>11.6</b> | ---                             | ---       | ---         | ---         | 61          | 31          | <b>46</b> |
| Irv (W)                 | ---                       | ---         | ---         | ---         | 13.0        | 11.3        | <b>12.1</b> | ---                             | ---       | ---         | ---         | 66          | 38          | <b>52</b> |
| <b>Location Average</b> | <b>15.6</b>               | <b>13.4</b> | <b>14.8</b> | <b>13.9</b> | <b>12.5</b> | <b>11.0</b> | <b>13.2</b> | <b>96</b>                       | <b>92</b> | <b>98</b>   | <b>91</b>   | <b>65</b>   | <b>37</b>   | <b>75</b> |

(W) = Hard White Winter

Table 63. Percent Flour Protein and Flour Yield of Hard Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection           | Flour Protein (14% mb) |             |             |             |             |              |             | Flour Yield (%) |           |           |             |           |              |           |
|--------------------------------|------------------------|-------------|-------------|-------------|-------------|--------------|-------------|-----------------|-----------|-----------|-------------|-----------|--------------|-----------|
|                                | Aberdeen               | Kimberly    | Rupert      | Ririe Irrig | Rockland    | Soda Springs | Average     | Aberdeen        | Kimberly  | Rupert    | Ririe Irrig | Rockland  | Soda Springs | Average   |
| <b>Hard Red Winter Wheat</b>   |                        |             |             |             |             |              |             |                 |           |           |             |           |              |           |
| Balance                        | 16.6                   | 11.6        | 12.8        | 12.8        | 11.0        | 8.8          | 12.3        | 67              | 72        | 70        | 71          | 73        | 69           | 70        |
| Flathead                       | 14.2                   | 10.8        | 11.3        | 10.7        | 9.8         | 8.4          | 10.9        | 72              | 75        | 74        | 74          | 73        | 71           | 73        |
| FourOsix                       | 12.0                   | 11.3        | 12.3        | 11.4        | 10.0        | 7.5          | 10.7        | 72              | 75        | 71        | 72          | 74        | 71           | 73        |
| Keldin                         | 13.4                   | 11.0        | 12.7        | 10.8        | 8.8         | 8.2          | 10.8        | 70              | 73        | 68        | 72          | 71        | 70           | 71        |
| Keldin + 11-52-0               | 14.1                   | 10.8        | 12.2        | 11.1        | 9.1         | 7.9          | 10.9        | 67              | 73        | 68        | 72          | 70        | 69           | 70        |
| LCS Jet                        | 11.8                   | 10.5        | 11.7        | 11.5        | 9.2         | 7.5          | 10.4        | 73              | 74        | 73        | 73          | 72        | 70           | 72        |
| LCS Rocket                     | 12.8                   | 10.7        | 11.5        | 11.0        | ---         | ---          | 11.5        | 72              | 73        | 71        | 72          | ---       | ---          | 72        |
| Milestone                      | 11.3                   | 11.3        | 11.5        | 11.0        | ---         | ---          | 11.2        | 70              | 73        | 71        | 71          | ---       | ---          | 71        |
| MT1745                         | 12.8                   | 10.1        | 11.6        | 11.0        | 9.2         | 8.1          | 10.5        | 74              | 74        | 71        | 72          | 73        | 71           | 72        |
| OR2170199R                     | 12.4                   | 10.6        | 12.1        | 11.4        | 10.9        | 8.1          | 10.9        | 71              | 71        | 68        | 70          | 71        | 71           | 70        |
| Scorpio                        | 12.7                   | 11.1        | 11.2        | 11.5        | 10.1        | 8.4          | 10.8        | 69              | 73        | 69        | 70          | 72        | 71           | 71        |
| WA8309                         | 13.0                   | 10.5        | 12.1        | 11.1        | 10.1        | 8.2          | 10.8        | 67              | 72        | 68        | 69          | 73        | 70           | 70        |
| WB4401                         | 14.0                   | 10.1        | 11.7        | 10.7        | 10.0        | 8.1          | 10.8        | 68              | 69        | 66        | 66          | 71        | 69           | 68        |
| WB4510CLP                      | 12.0                   | 10.5        | 11.0        | 11.2        | 9.6         | 8.0          | 10.4        | 70              | 73        | 71        | 71          | 72        | 71           | 71        |
| Yellowstone                    | 13.5                   | 10.6        | 12.9        | 11.6        | 9.4         | 8.0          | 11.0        | 69              | 73        | 70        | 71          | 72        | 70           | 71        |
| Kairos                         | 11.9                   | 10.6        | 11.4        | 11.3        | ---         | ---          | 11.3        | 73              | 74        | 72        | 72          | ---       | ---          | 73        |
| Juniper                        | ---                    | ---         | ---         | ---         | 10.3        | 8.7          | 9.5         | ---             | ---       | ---       | ---         | 72        | 68           | 70        |
| Promontory                     | ---                    | ---         | ---         | ---         | 10.7        | 9.3          | 10.0        | ---             | ---       | ---       | ---         | 74        | 71           | 72        |
| Sequoia                        | ---                    | ---         | ---         | ---         | 8.9         | 8.4          | 8.6         | ---             | ---       | ---       | ---         | 73        | 72           | 72        |
| UI Silver                      | ---                    | ---         | ---         | ---         | 10.3        | 8.0          | 9.1         | ---             | ---       | ---       | ---         | 73        | 71           | 72        |
| UI SRG                         | ---                    | ---         | ---         | ---         | 9.8         | 8.6          | 9.2         | ---             | ---       | ---       | ---         | 71        | 71           | 71        |
| <b>Location Average</b>        | <b>13.0</b>            | <b>10.8</b> | <b>11.9</b> | <b>11.2</b> | <b>9.8</b>  | <b>8.2</b>   | <b>10.6</b> | <b>70</b>       | <b>73</b> | <b>70</b> | <b>71</b>   | <b>72</b> | <b>70</b>    | <b>71</b> |
| <b>Hard White Winter Wheat</b> |                        |             |             |             |             |              |             |                 |           |           |             |           |              |           |
| IDO1906 (W)                    | 13.3                   | 11.6        | 12.3        | 12.3        | 9.7         | 8.8          | 11.3        | 68              | 72        | 67        | 69          | 71        | 70           | 70        |
| IDO2006 (W)                    | 12.4                   | 10.2        | 12.3        | 10.7        | 10.1        | 7.5          | 10.5        | 71              | 71        | 69        | 71          | 72        | 70           | 71        |
| Millie (W)                     | 13.2                   | 11.1        | 13.5        | 11.9        | 9.9         | 8.8          | 11.4        | 71              | 73        | 69        | 71          | 72        | 70           | 71        |
| OR2170052H (W)                 | 12.7                   | 10.6        | 12.3        | 11.3        | 10.6        | 7.6          | 10.8        | 66              | 72        | 64        | 70          | 71        | 69           | 69        |
| UI Bronze Jade (W)             | 12.2                   | 10.7        | 11.7        | 11.4        | 10.7        | 8.4          | 10.8        | 72              | 75        | 71        | 73          | 75        | 74           | 74        |
| Golden Spike (W)               | ---                    | ---         | ---         | ---         | 9.5         | 8.1          | 8.8         | ---             | ---       | ---       | ---         | 72        | 72           | 72        |
| Irv (W)                        | ---                    | ---         | ---         | ---         | 10.3        | 8.5          | 9.4         | ---             | ---       | ---       | ---         | 73        | 71           | 72        |
| <b>Location Average</b>        | <b>12.7</b>            | <b>10.8</b> | <b>12.4</b> | <b>11.5</b> | <b>10.1</b> | <b>8.2</b>   | <b>10.4</b> | <b>70</b>       | <b>73</b> | <b>68</b> | <b>71</b>   | <b>72</b> | <b>71</b>    | <b>71</b> |

mb = moisture basis

**Table 64. Bake Volume of Hard Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2022.**

| Variety or Selection           | Bake Volume (cc) |            |            |             |            | Average     |
|--------------------------------|------------------|------------|------------|-------------|------------|-------------|
|                                | Aberdeen         | Kimberly   | Rupert     | Ririe Irrig | Rockland   |             |
| <b>Hard Red Winter Wheat</b>   |                  |            |            |             |            |             |
| Balance                        | 1175             | 1075       | 925        | 1050        | 975        | <b>1040</b> |
| LCS Rocket                     | 1125             | 1050       | 925        | 975         | ---        | <b>1019</b> |
| Flathead                       | 1200             | 1000       | 900        | 1025        | 825        | <b>990</b>  |
| Yellowstone                    | 1200             | 950        | 1000       | 975         | 775        | <b>980</b>  |
| FourOsix                       | 1025             | 1075       | 925        | 1025        | 800        | <b>970</b>  |
| OR2170199R                     | 1075             | 975        | 925        | 975         | 875        | <b>965</b>  |
| Milestone                      | 1025             | 1025       | 850        | 900         | ---        | <b>950</b>  |
| MT1745                         | 1150             | 1050       | 850        | 900         | 800        | <b>950</b>  |
| Kairos                         | 1075             | 900        | 900        | 900         | ---        | <b>944</b>  |
| Scorpio                        | 1050             | 900        | 875        | 950         | 825        | <b>920</b>  |
| Keldin + 11-52-0               | 1125             | 975        | 775        | 875         | 800        | <b>910</b>  |
| WB4510CLP                      | 1075             | 875        | 800        | 950         | 850        | <b>910</b>  |
| Keldin                         | 1075             | 975        | 800        | 875         | 725        | <b>890</b>  |
| LCS Jet                        | 1000             | 925        | 800        | 975         | 725        | <b>885</b>  |
| Promontory                     | ---              | ---        | ---        | ---         | 875        | <b>875</b>  |
| WA8309                         | 925              | 850        | 850        | 925         | 800        | <b>870</b>  |
| UI Silver                      | ---              | ---        | ---        | ---         | 825        | <b>825</b>  |
| Juniper                        | ---              | ---        | ---        | ---         | 800        | <b>800</b>  |
| UI SRG                         | ---              | ---        | ---        | ---         | 800        | <b>800</b>  |
| Sequoia                        | ---              | ---        | ---        | ---         | 700        | <b>700</b>  |
| WB4401                         | >1200            | <600       | <400       | 600         | 600        | <b>600</b>  |
| <b>Location Average</b>        | <b>1087</b>      | <b>973</b> | <b>873</b> | <b>930</b>  | <b>799</b> | <b>895</b>  |
| <b>Hard White Winter Wheat</b> |                  |            |            |             |            |             |
| IDO1906 (W)                    | 1200             | 1075       | 950        | 1125        | 800        | <b>1030</b> |
| Millie (W)                     | 1100             | 975        | 950        | 975         | 825        | <b>965</b>  |
| IDO2006 (W)                    | 1100             | 875        | 900        | 925         | 850        | <b>930</b>  |
| UI Bronze Jade (W)             | 1075             | 950        | 900        | 875         | 800        | <b>920</b>  |
| OR2170052H (W)                 | 1050             | 875        | 850        | 900         | 850        | <b>905</b>  |
| Irv (W)                        | ---              | ---        | ---        | ---         | 850        | <b>850</b>  |
| Golden Spike (W)               | ---              | ---        | ---        | ---         | 800        | <b>800</b>  |
| <b>Location Average</b>        | <b>1105</b>      | <b>950</b> | <b>910</b> | <b>960</b>  | <b>825</b> | <b>914</b>  |

Table 65. Grain Protein &amp; Kernel Hardness of Soft White Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection | -----Grain Protein %----- |             |             |             |             |              |             | -----Kernel Hardness 0-100----- |           |           |             |           |              |           |
|----------------------|---------------------------|-------------|-------------|-------------|-------------|--------------|-------------|---------------------------------|-----------|-----------|-------------|-----------|--------------|-----------|
|                      | Aberdeen                  | Kimberly    | Rupert      | Ririe Irrig | Rockland    | Soda Springs | Average     | Aberdeen                        | Kimberly  | Rupert    | Ririe Irrig | Rockland  | Soda Springs | Average   |
| AP Exceed            | 11.9                      | 10.7        | 14.1        | 12.3        | ---         | ---          | 12.2        | 36                              | 33        | 42        | 27          | ---       | ---          | 35        |
| AP Iliad             | 12.5                      | 11.7        | 13.6        | 12.9        | 12.8        | 10.7         | 12.4        | 38                              | 35        | 47        | 43          | 14        | 23           | 33        |
| Brundage             | 13.5                      | 11.1        | 14.4        | 12.1        | 12.5        | 11.0         | 12.4        | 42                              | 34        | 38        | 24          | 15        | 18           | 29        |
| IDO1708              | 14.3                      | 11.5        | 14.4        | 12.3        | 13.1        | 10.3         | 12.6        | 38                              | 33        | 60        | 59          | 19        | 21           | 38        |
| IDO2008              | 14.9                      | 11.6        | 14.2        | 12.8        | 13.2        | 11.3         | 13.0        | 39                              | 35        | 50        | 30          | 19        | 20           | 32        |
| LCS Blackjack        | 13.0                      | 11.1        | 14.0        | 11.9        | ---         | ---          | 12.5        | 38                              | 25        | 47        | 43          | ---       | ---          | 38        |
| LCS Hulk             | 13.0                      | 11.2        | 14.0        | 12.8        | ---         | 10.9         | 12.4        | 37                              | 37        | 45        | 38          | ---       | 24           | 36        |
| LWW17-5877           | 14.1                      | 11.1        | 13.3        | 12.6        | ---         | ---          | 12.8        | 36                              | 30        | 52        | 47          | ---       | ---          | 41        |
| M-Press              | 11.8                      | 11.1        | 13.6        | 12.6        | 12.6        | 11.1         | 12.1        | 47                              | 35        | 50        | 47          | 20        | 22           | 37        |
| Norwest Tandem       | 12.7                      | 11.1        | 13.8        | 11.9        | 12.2        | 11.0         | 12.1        | 38                              | 38        | 47        | 46          | 22        | 30           | 37        |
| OR2130755            | 15.0                      | 11.9        | 13.3        | 12.6        | ---         | ---          | 13.2        | 40                              | 28        | 42        | 32          | ---       | ---          | 35        |
| OR2160243            | 14.1                      | 11.4        | 14.4        | 12.4        | ---         | ---          | 13.1        | 39                              | 27        | 43        | 41          | ---       | ---          | 38        |
| OR2160264            | 12.6                      | 11.8        | 14.5        | 12.8        | ---         | ---          | 12.9        | 39                              | 32        | 49        | 35          | ---       | ---          | 39        |
| OR2170559            | 13.1                      | 12.1        | 14.6        | 12.4        | ---         | ---          | 13.1        | 39                              | 37        | 44        | 34          | ---       | ---          | 39        |
| OR2180377            | 13.4                      | 11.5        | 13.7        | 12.4        | ---         | ---          | 12.8        | 48                              | 29        | 49        | 43          | ---       | ---          | 42        |
| Piranha CL+          | 12.2                      | 11.0        | 13.1        | 12.7        | 12.6        | 10.7         | 12.0        | 27                              | 27        | 39        | 41          | 13        | 20           | 28        |
| Sockeye CL+          | 14.0                      | 10.9        | 14.6        | 12.7        | 12.0        | 10.6         | 12.5        | 36                              | 24        | 50        | 33          | 19        | 22           | 31        |
| Stephens             | 13.1                      | 12.0        | 15.9        | 12.7        | 13.3        | 11.1         | 13.0        | 41                              | 39        | 51        | 44          | 26        | 20           | 37        |
| Stingray CL+         | 13.9                      | 11.1        | 14.9        | 12.8        | ---         | ---          | 13.2        | 38                              | 30        | 47        | 29          | ---       | ---          | 36        |
| SY Assure            | 12.3                      | 11.7        | 12.9        | 12.3        | 11.9        | 10.5         | 11.9        | 28                              | 30        | 41        | 33          | 20        | 23           | 29        |
| SY Ovation           | 13.2                      | 11.5        | 13.3        | 12.4        | 12.4        | 11.2         | 12.3        | 39                              | 33        | 56        | 33          | 19        | 22           | 34        |
| UI Magic CL+         | 13.0                      | 10.8        | 14.3        | 12.6        | 12.8        | 10.8         | 12.4        | 38                              | 26        | 51        | 35          | 18        | 27           | 32        |
| UI Sparrow           | 13.5                      | 10.8        | 14.1        | 13.2        | 12.0        | 11.2         | 12.5        | 42                              | 33        | 57        | 49          | 23        | 20           | 37        |
| UIL13-046145A        | 11.3                      | 10.8        | 13.9        | 11.6        | ---         | ---          | 11.9        | 35                              | 32        | 42        | 29          | ---       | ---          | 34        |
| UIL15-028024         | 11.7                      | 10.6        | 14.2        | 12.3        | ---         | 10.6         | 11.9        | 45                              | 33        | 53        | 33          | ---       | 27           | 38        |
| UIL15-423062A        | 13.0                      | 11.2        | 14.6        | 12.6        | ---         | 10.7         | 12.4        | 31                              | 23        | 41        | 23          | ---       | 13           | 26        |
| UIL15-451104B        | 12.0                      | 11.5        | 14.4        | 12.3        | ---         | 10.6         | 12.2        | 29                              | 31        | 39        | 31          | ---       | 26           | 31        |
| VI Presto CL+        | 12.3                      | 11.8        | 15.0        | 12.6        | 12.9        | 11.8         | 12.7        | 23                              | 33        | 46        | 22          | 17        | 22           | 27        |
| VI Shock             | 11.6                      | 10.8        | 14.6        | 12.0        | ---         | ---          | 12.2        | 26                              | 26        | 39        | 22          | ---       | ---          | 28        |
| VI Voodoo CL+        | 13.2                      | 11.5        | 13.1        | 13.1        | 12.8        | 11.3         | 12.5        | 26                              | 23        | 36        | 25          | 18        | 28           | 26        |
| WA8415               | 14.3                      | 11.0        | 12.9        | 12.9        | ---         | ---          | 12.8        | 40                              | 36        | 43        | 37          | ---       | ---          | 39        |
| WB 456               | 14.6                      | 12.1        | 13.1        | 13.2        | 13.2        | 11.4         | 12.9        | 46                              | 46        | 45        | 39          | 22        | 24           | 37        |
| WB1376CLP            | 13.2                      | 11.6        | 14.7        | 12.9        | 14.1        | 11.4         | 13.0        | 31                              | 34        | 53        | 24          | 30        | 26           | 33        |
| WB1529               | 11.7                      | 11.3        | 13.0        | 12.1        | 13.1        | 10.9         | 12.0        | 34                              | 31        | 41        | 24          | 17        | 20           | 28        |
| WB1621               | 12.8                      | 10.9        | 14.4        | 11.9        | 12.8        | 10.0         | 12.1        | 32                              | 27        | 48        | 23          | 27        | 20           | 30        |
| WB1783               | 12.0                      | 11.0        | 13.6        | 12.6        | 13.0        | 10.6         | 12.1        | 53                              | 38        | 48        | 35          | 24        | 27           | 37        |
| YSC-215              | 14.2                      | ---         | ---         | 12.2        | ---         | ---          | 13.2        | 36                              | ---       | ---       | 31          | ---       | ---          | 33        |
| YSC-268              | 13.2                      | ---         | ---         | ---         | ---         | ---          | 13.2        | 44                              | ---       | ---       | ---         | ---       | ---          | 44        |
| YSC-93               | 13.6                      | ---         | ---         | 12.2        | ---         | ---          | 12.9        | 50                              | ---       | ---       | 42          | ---       | ---          | 46        |
| Appleby CL+          | ---                       | ---         | ---         | ---         | 13.1        | 11.3         | 12.2        | ---                             | ---       | ---       | ---         | 28        | 27           | 28        |
| Devote               | ---                       | ---         | ---         | ---         | 12.8        | 11.3         | 12.0        | ---                             | ---       | ---       | ---         | 19        | 20           | 20        |
| Eltan                | ---                       | ---         | ---         | ---         | 12.2        | 10.5         | 11.4        | ---                             | ---       | ---       | ---         | 20        | 22           | 21        |
| Eltan 11-52-0        | ---                       | ---         | ---         | ---         | 12.2        | 11.8         | 12.0        | ---                             | ---       | ---       | ---         | 9         | 17           | 13        |
| Norwest Duet         | ---                       | ---         | ---         | ---         | 12.6        | 11.0         | 11.8        | ---                             | ---       | ---       | ---         | 21        | 29           | 25        |
| ORI2190025 CL+       | ---                       | ---         | ---         | ---         | 13.6        | 10.8         | 12.2        | ---                             | ---       | ---       | ---         | 17        | 25           | 21        |
| ORI2190027CL+        | ---                       | ---         | ---         | ---         | 13.7        | 11.0         | 12.3        | ---                             | ---       | ---       | ---         | 28        | 22           | 25        |
| Otto                 | ---                       | ---         | ---         | ---         | 14.6        | 10.8         | 12.7        | ---                             | ---       | ---       | ---         | 17        | 26           | 21        |
| UIL14-085001A        | ---                       | ---         | ---         | ---         | 13.4        | 10.8         | 12.1        | ---                             | ---       | ---       | ---         | 21        | 14           | 18        |
| UIL16-072025         | ---                       | ---         | ---         | ---         | 12.8        | 10.3         | 11.6        | ---                             | ---       | ---       | ---         | 15        | 20           | 18        |
| UIL16-478001         | ---                       | ---         | ---         | ---         | 13.6        | 11.6         | 12.6        | ---                             | ---       | ---       | ---         | 26        | 21           | 24        |
| WA8334               | ---                       | ---         | ---         | ---         | 13.0        | 10.4         | 11.7        | ---                             | ---       | ---       | ---         | 14        | 25           | 19        |
| <b>Average</b>       | <b>13.1</b>               | <b>11.3</b> | <b>14.0</b> | <b>12.5</b> | <b>12.9</b> | <b>10.9</b>  | <b>12.4</b> | <b>38</b>                       | <b>32</b> | <b>46</b> | <b>35</b>   | <b>20</b> | <b>23</b>    | <b>31</b> |

Table 66. Percent Flour Protein and Flour Yield of Soft White Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection | Flour Protein (%) |          |        |             |          |              |             | Flour Yield (%) |          |        |             |          |              |             |
|----------------------|-------------------|----------|--------|-------------|----------|--------------|-------------|-----------------|----------|--------|-------------|----------|--------------|-------------|
|                      | Aberdeen          | Kimberly | Rupert | Ririe Irrig | Rockland | Soda Springs | Average     | Aberdeen        | Kimberly | Rupert | Ririe Irrig | Rockland | Soda Springs | Average     |
| AP Exceed            | 9.39              | 8.52     | 11.11  | 9.74        | ---      | ---          | <b>9.7</b>  | 72.9            | 74.5     | 68.0   | 74.4        | ---      | ---          | <b>72.5</b> |
| AP Iliad             | 9.79              | 9.14     | 11.71  | 9.95        | 10.5     | 8.6          | <b>9.9</b>  | 73.6            | 74.5     | 70.0   | 75.0        | 75.1     | 74.7         | <b>73.8</b> |
| Brundage             | 11.66             | 8.88     | 10.92  | 9.68        | 10.5     | 8.5          | <b>10.0</b> | 71.2            | 75.5     | 67.9   | 74.5        | 73.8     | 74.9         | <b>73.0</b> |
| IDO1708              | 12.5              | 9.23     | 11.98  | 9.69        | 10.9     | 8.4          | <b>10.5</b> | 70.2            | 74.9     | 66.5   | 75.0        | 74.4     | 74.5         | <b>72.6</b> |
| IDO2008              | 12.47             | 8.93     | 11.73  | 10.22       | 10.3     | 8.5          | <b>10.4</b> | 70.6            | 75.0     | 67.5   | 73.3        | 74.5     | 74.3         | <b>72.5</b> |
| LCS Blackjack        | 10.12             | 8.64     | 11.6   | 9.79        | ---      | ---          | <b>10.0</b> | 75.4            | 77.2     | 70.5   | 77.5        | ---      | ---          | <b>75.1</b> |
| LCS Hulk             | 11.79             | 9.05     | 11.79  | 10.17       | ---      | 8.9          | <b>10.3</b> | 69.4            | 74.6     | 66.5   | 74.1        | ---      | 74.3         | <b>71.8</b> |
| LWW17-5877           | 11.01             | 8.94     | 10.36  | 10.12       | ---      | ---          | <b>10.1</b> | 74.3            | 75.1     | 70.6   | 75.9        | ---      | ---          | <b>74.0</b> |
| M-Press              | 9.47              | 8.87     | 11     | 9.97        | 10.5     | 8.4          | <b>9.7</b>  | 76.7            | 75.7     | 69.6   | 75.1        | 75.7     | 75.3         | <b>74.7</b> |
| Norwest Tandem       | 9.96              | 9.05     | 11.15  | 9.15        | 9.8      | 8.6          | <b>9.6</b>  | 72.4            | 73.1     | 66.6   | 74.2        | 73.5     | 73.5         | <b>72.2</b> |
| OR2130755            | 12.43             | 9.11     | 10.87  | 9.95        | ---      | ---          | <b>10.6</b> | 70.2            | 74.9     | 70.3   | 75.2        | ---      | ---          | <b>72.6</b> |
| OR2160243            | 11.49             | 8.85     | 11.98  | 9.9         | ---      | ---          | <b>10.6</b> | 71.4            | 75.2     | 64.9   | 74.7        | ---      | ---          | <b>71.5</b> |
| OR2160264            | 10.06             | 9.47     | 12.21  | 9.77        | ---      | ---          | <b>10.4</b> | 75.9            | 76.3     | 68.4   | 74.3        | ---      | ---          | <b>73.7</b> |
| OR2170559            | 10.71             | 9.53     | 11.34  | 10.2        | ---      | ---          | <b>10.4</b> | 75.0            | 75.7     | 69.6   | 75.9        | ---      | ---          | <b>74.1</b> |
| OR2180377            | 10.81             | 9.15     | 11.28  | 9.71        | ---      | ---          | <b>10.2</b> | 73.4            | 76.3     | 66.9   | 75.7        | ---      | ---          | <b>73.0</b> |
| Piranha CL+          | 9.46              | 8.78     | 10.49  | 9.81        | 10.3     | 8.0          | <b>9.5</b>  | 74.3            | 74.3     | 66.7   | 73.0        | 74.1     | 74.5         | <b>72.8</b> |
| Sockeye CL+          | 11.32             | 8.47     | 12.15  | 10.12       | 9.5      | 8.2          | <b>10.0</b> | 71.1            | 74.8     | 65.4   | 74.1        | 73.9     | 75.0         | <b>72.4</b> |
| Stephens             | 10.64             | 9.67     | 12.7   | 10.12       | 11.0     | 8.3          | <b>10.4</b> | 74.0            | 74.5     | 63.7   | 73.7        | 73.0     | 75.2         | <b>72.4</b> |
| Stingray CL+         | 11.87             | 8.79     | 12.43  | 10.22       | ---      | ---          | <b>10.8</b> | 71.6            | 73.9     | 64.1   | 72.7        | ---      | ---          | <b>70.6</b> |
| SY Assure            | 9.7               | 9.32     | 10.09  | 9.64        | 9.3      | 8.3          | <b>9.4</b>  | 73.7            | 74.2     | 70.2   | 74.4        | 72.6     | 72.3         | <b>72.9</b> |
| SY Ovation           | 11.04             | 8.81     | 10.58  | 9.96        | 9.9      | 8.7          | <b>9.8</b>  | 72.3            | 73.8     | 70.2   | 75.1        | 74.6     | 74.5         | <b>73.4</b> |
| UI Magic CL+         | 10.53             | 8.81     | 11.61  | 10.21       | 10.4     | 8.8          | <b>10.1</b> | 73.6            | 74.8     | 65.3   | 73.7        | 72.4     | 73.8         | <b>72.3</b> |
| UI Sparrow           | 11.07             | 8.74     | 11.29  | 10.2        | 9.7      | 8.1          | <b>9.8</b>  | 71.1            | 74.6     | 66.3   | 73.3        | 72.5     | 74.2         | <b>72.0</b> |
| UIL13-046145A        | 8.95              | 8.36     | 11.21  | 9.25        | ---      | ---          | <b>9.4</b>  | 75.6            | 75.1     | 64.3   | 73.6        | ---      | ---          | <b>72.2</b> |
| UIL15-028024         | 8.75              | 8.31     | 11.51  | 9.36        | ---      | 8.2          | <b>9.2</b>  | 75.5            | 74.5     | 65.1   | 73.4        | ---      | 73.8         | <b>72.4</b> |
| UIL15-423062A        | 10.6              | 8.68     | 11.4   | 10.07       | ---      | 7.7          | <b>9.7</b>  | 73.6            | 75.6     | 65.3   | 73.3        | ---      | 73.4         | <b>72.2</b> |
| UIL15-451104B        | 9.55              | 8.8      | 12.42  | 9.42        | ---      | 8.3          | <b>9.7</b>  | 73.4            | 74.5     | 64.5   | 73.5        | ---      | 74.2         | <b>72.0</b> |
| VI Presto CL+        | 9.96              | 9.08     | 11.96  | 10.12       | 10.5     | 8.9          | <b>10.1</b> | 74.8            | 76.0     | 66.9   | 74.2        | 73.1     | 74.0         | <b>73.2</b> |
| VI Shock             | 9.23              | 8.72     | 12.52  | 9.82        | ---      | ---          | <b>10.1</b> | 75.7            | 76.6     | 64.6   | 74.8        | ---      | ---          | <b>72.9</b> |
| VI Voodoo CL+        | 10.66             | 9.2      | 10.21  | 9.81        | 10.2     | 9.1          | <b>9.9</b>  | 72.2            | 74.8     | 68.1   | 73.6        | 72.1     | 73.0         | <b>72.3</b> |
| WA8515               | 11.94             | 8.84     | 10.29  | 10.12       | ---      | ---          | <b>10.3</b> | 71.3            | 76.0     | 70.1   | 74.3        | ---      | ---          | <b>72.9</b> |
| WB 456               | 12.74             | 9.6      | 10.29  | 10.6        | 10.9     | 8.7          | <b>10.5</b> | 72.0            | 75.8     | 70.6   | 74.9        | 73.0     | 74.0         | <b>73.4</b> |
| WB1376CLP            | 10.39             | 9.17     | 12.28  | 10.19       | 11.4     | 8.8          | <b>10.4</b> | 73.2            | 73.3     | 71.0   | 72.9        | 71.3     | 72.6         | <b>72.4</b> |
| WB1529               | 9.62              | 8.6      | 10.67  | 9.44        | 10.6     | 8.6          | <b>9.6</b>  | 72.0            | 71.9     | 69.5   | 72.9        | 71.2     | 72.1         | <b>71.6</b> |
| WB1621               | 10.06             | 8.53     | 11.44  | 9.38        | 10.5     | 7.4          | <b>9.6</b>  | 75.5            | 75.1     | 68.9   | 75.2        | 71.2     | 74.0         | <b>73.3</b> |
| WB1783               | 9.64              | 8.37     | 10.71  | 9.98        | 11.0     | 8.2          | <b>9.7</b>  | 74.3            | 74.2     | 69.1   | 75.2        | 72.4     | 74.1         | <b>73.2</b> |
| YSC-215              | 11.56             | ---      | ---    | 9.65        | ---      | ---          | <b>10.6</b> | 71.0            | ---      | ---    | 75.9        | ---      | ---          | <b>73.4</b> |
| YSC-268              | 10.34             | ---      | ---    | ---         | ---      | ---          | <b>10.3</b> | 72.4            | ---      | ---    | ---         | ---      | ---          | <b>72.4</b> |
| YSC-93               | 9.76              | ---      | ---    | 9.36        | ---      | ---          | <b>9.6</b>  | 72.4            | ---      | ---    | 75.4        | ---      | ---          | <b>73.9</b> |
| Appleby CL+          | ---               | ---      | ---    | ---         | 10.8     | 8.7          | <b>9.7</b>  | ---             | ---      | ---    | ---         | 72.5     | 73.7         | <b>73.1</b> |
| Devote               | ---               | ---      | ---    | ---         | 10.5     | 8.4          | <b>9.5</b>  | ---             | ---      | ---    | ---         | 71.1     | 71.6         | <b>71.3</b> |
| Eltan                | ---               | ---      | ---    | ---         | 9.7      | 7.9          | <b>8.8</b>  | ---             | ---      | ---    | ---         | 71.3     | 73.1         | <b>72.2</b> |
| Eltan 11-52-0        | ---               | ---      | ---    | ---         | 9.6      | 8.5          | <b>9.0</b>  | ---             | ---      | ---    | ---         | 72.1     | 71.7         | <b>71.9</b> |
| Norwest Duet         | ---               | ---      | ---    | ---         | 10.0     | 8.7          | <b>9.3</b>  | ---             | ---      | ---    | ---         | 73.4     | 74.4         | <b>73.9</b> |
| OR12190025 CL+       | ---               | ---      | ---    | ---         | 10.9     | 8.2          | <b>9.5</b>  | ---             | ---      | ---    | ---         | 73.4     | 75.0         | <b>74.2</b> |
| OR12190027CL+        | ---               | ---      | ---    | ---         | 11.0     | 8.5          | <b>9.7</b>  | ---             | ---      | ---    | ---         | 70.7     | 71.2         | <b>71.0</b> |
| Otto                 | ---               | ---      | ---    | ---         | 11.7     | 8.1          | <b>9.9</b>  | ---             | ---      | ---    | ---         | 71.1     | 71.0         | <b>71.1</b> |
| UIL14-085001A        | ---               | ---      | ---    | ---         | 10.5     | 8.0          | <b>9.2</b>  | ---             | ---      | ---    | ---         | 72.1     | 72.7         | <b>72.4</b> |
| UIL16-072025         | ---               | ---      | ---    | ---         | 10.1     | 7.7          | <b>8.9</b>  | ---             | ---      | ---    | ---         | 73.0     | 71.8         | <b>72.4</b> |
| UIL16-478001         | ---               | ---      | ---    | ---         | 11.3     | 8.6          | <b>10.0</b> | ---             | ---      | ---    | ---         | 72.1     | 71.9         | <b>72.0</b> |

Table 67. Percent Break Flour Yield and Cookie Diameter of Soft White Winter Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection    | Break Flour Yield (%) |             |             |             |             |              |             | Cookie Diameter (cm) |            |            |             |            |              |            |
|-------------------------|-----------------------|-------------|-------------|-------------|-------------|--------------|-------------|----------------------|------------|------------|-------------|------------|--------------|------------|
|                         | Aberdeen              | Kimberly    | Rupert      | Ririe Irrig | Rockland    | Soda Springs | Average     | Aberdeen             | Kimberly   | Rupert     | Ririe Irrig | Rockland   | Soda Springs | Average    |
| AP Exceed               | 47.4                  | 47.3        | 45.1        | 51.6        | ---         | ---          | 47.8        | 8.8                  | 8.7        | 8.4        | 8.8         | ---        | ---          | 8.7        |
| AP Iliad                | 44.9                  | 44.8        | 44.6        | 48.4        | 54.3        | 53.3         | 48.4        | 8.8                  | 8.6        | 8.8        | 8.7         | 8.5        | 8.7          | 8.7        |
| Brundage                | 47.3                  | 47.4        | 46.2        | 52.2        | 57.2        | 56.8         | 51.2        | 8.6                  | 9.0        | 8.4        | 9.3         | 8.8        | 9.0          | 8.8        |
| IDO1708                 | 43.6                  | 46.5        | 42.7        | 49.3        | 53.4        | 54.1         | 48.3        | 8.1                  | 8.6        | 8.3        | 8.8         | 8.8        | 9.0          | 8.6        |
| IDO2008                 | 45.5                  | 50.2        | 45.8        | 53.0        | 56.5        | 55.0         | 51.0        | 8.4                  | 9.1        | 8.4        | 9.1         | 8.7        | 8.9          | 8.8        |
| LCS Blackjack           | 45.4                  | 47.8        | 44.9        | 49.9        | ---         | ---          | 47.0        | 8.9                  | 8.9        | 8.3        | 8.9         | ---        | ---          | 8.8        |
| LCS Hulk                | 43.2                  | 46.6        | 43.7        | 49.0        | ---         | 53.9         | 47.3        | 8.4                  | 9.1        | 8.2        | 8.8         | ---        | 9.0          | 8.7        |
| LWW17-5877              | 43.5                  | 44.7        | 44.1        | 47.8        | ---         | ---          | 45.0        | 8.4                  | 8.7        | 8.4        | 8.8         | ---        | ---          | 8.5        |
| M-Press                 | 43.5                  | 45.2        | 44.1        | 47.7        | 53.4        | 53.3         | 47.9        | 8.8                  | 8.8        | 8.3        | 8.8         | 8.9        | 8.9          | 8.7        |
| Norwest Tandem          | 44.5                  | 45.0        | 43.2        | 48.1        | 53.4        | 52.1         | 47.7        | 8.8                  | 8.6        | 8.5        | 9.0         | 8.9        | 8.8          | 8.8        |
| OR2130755               | 46.8                  | 47.7        | 47.8        | 51.6        | ---         | ---          | 48.5        | 8.2                  | 9.1        | 8.5        | 9.1         | ---        | ---          | 8.7        |
| OR2160243               | 47.4                  | 49.9        | 44.5        | 52.6        | ---         | ---          | 48.6        | 8.6                  | 9.1        | 8.5        | 9.1         | ---        | ---          | 8.8        |
| OR2160264               | 47.5                  | 48.4        | 45.5        | 51.1        | ---         | ---          | 48.1        | 9.1                  | 8.9        | 8.5        | 9.0         | ---        | ---          | 8.9        |
| OR2170559               | 44.5                  | 45.7        | 43.8        | 48.9        | ---         | ---          | 45.7        | 8.9                  | 8.8        | 8.6        | 9.0         | ---        | ---          | 8.8        |
| OR2180377               | 46.3                  | 47.7        | 45.0        | 49.9        | ---         | ---          | 47.2        | 8.8                  | 9.0        | 8.5        | 9.0         | ---        | ---          | 8.8        |
| Piranha CL+             | 46.5                  | 47.8        | 45.0        | 49.3        | 55.4        | 54.3         | 49.7        | 9.0                  | 8.9        | 8.6        | 8.5         | 8.8        | 8.9          | 8.8        |
| Sockeye CL+             | 48.1                  | 50.2        | 44.0        | 51.7        | 55.9        | 57.0         | 51.2        | 8.7                  | 9.4        | 8.4        | 9.1         | 9.0        | 9.1          | 8.9        |
| Stephens                | 42.7                  | 43.1        | 38.8        | 45.2        | 51.1        | 50.9         | 45.3        | 8.9                  | 8.9        | 8.3        | 8.7         | 8.6        | 8.9          | 8.7        |
| Stingray CL+            | 45.3                  | 47.9        | 43.1        | 50.2        | ---         | ---          | 46.6        | 8.6                  | 9.2        | 8.2        | 9.0         | ---        | ---          | 8.8        |
| SY Assure               | 46.5                  | 45.9        | 45.3        | 48.1        | 54.0        | 51.8         | 48.6        | 8.9                  | 9.0        | 8.9        | 9.1         | 9.0        | 9.1          | 9.0        |
| SY Ovation              | 44.4                  | 45.9        | 44.6        | 47.2        | 52.6        | 52.5         | 47.9        | 8.6                  | 8.8        | 8.6        | 8.9         | 8.9        | 8.9          | 8.8        |
| UI Magic CL+            | 43.5                  | 45.4        | 41.1        | 48.2        | 51.8        | 51.8         | 47.0        | 8.7                  | 8.9        | 8.5        | 8.9         | 8.6        | 8.9          | 8.8        |
| UI Sparrow              | 42.9                  | 46.0        | 43.0        | 46.0        | 53.7        | 53.4         | 47.5        | 8.6                  | 9.0        | 8.6        | 8.9         | 8.6        | 9.2          | 8.8        |
| UIL13-046145A           | 48.9                  | 48.2        | 43.9        | 51.0        | ---         | ---          | 48.0        | 9.0                  | 9.1        | 8.5        | 9.1         | ---        | ---          | 8.9        |
| UIL15-028024            | 47.5                  | 48.7        | 42.5        | 49.3        | ---         | 52.6         | 48.1        | 9.1                  | 9.0        | 8.2        | 9.0         | ---        | 9.2          | 8.9        |
| UIL15-423062A           | 46.7                  | 49.0        | 43.6        | 48.6        | ---         | 52.1         | 48.0        | 8.7                  | 8.8        | 8.4        | 8.7         | ---        | 9.0          | 8.7        |
| UIL15-451104B           | 52.5                  | 50.7        | 46.8        | 52.1        | ---         | 55.4         | 51.5        | 8.8                  | 9.2        | 8.2        | 9.0         | ---        | 9.3          | 8.9        |
| VI Presto CL+           | 45.3                  | 45.8        | 39.9        | 46.3        | 50.5        | 48.4         | 46.0        | 8.9                  | 9.0        | 8.4        | 8.9         | 8.9        | 8.9          | 8.8        |
| VI Shock                | 50.4                  | 50.7        | 43.7        | 51.7        | ---         | ---          | 49.1        | 9.0                  | 9.0        | 8.3        | 9.1         | ---        | ---          | 8.8        |
| VI Voodoo CL+           | 47.2                  | 49.2        | 45.9        | 52.3        | 53.5        | 52.6         | 50.1        | 8.4                  | 8.8        | 8.5        | 8.8         | 8.6        | 9.1          | 8.7        |
| WA8415                  | 42.5                  | 47.1        | 45.0        | 48.6        | ---         | ---          | 45.8        | 8.4                  | 9.0        | 8.5        | 8.8         | ---        | ---          | 8.6        |
| WB 456                  | 44.6                  | 44.3        | 44.0        | 48.5        | 52.7        | 50.6         | 47.4        | 8.3                  | 8.8        | 8.7        | 8.8         | 8.8        | 9.0          | 8.7        |
| WB1376CLP               | 43.3                  | 43.1        | 44.3        | 48.2        | 50.0        | 49.0         | 46.3        | 8.6                  | 8.9        | 8.3        | 8.9         | 8.4        | 8.7          | 8.7        |
| WB1529                  | 44.2                  | 44.7        | 45.0        | 48.0        | 53.4        | 52.3         | 48.0        | 8.8                  | 8.9        | 8.6        | 9.0         | 8.7        | 9.1          | 8.8        |
| WB1621                  | 46.6                  | 47.3        | 46.7        | 50.4        | 52.8        | 55.0         | 49.8        | 8.9                  | 9.0        | 8.3        | 9.3         | 8.7        | 9.2          | 8.9        |
| WB1783                  | 41.1                  | 43.0        | 41.3        | 45.3        | 49.2        | 48.2         | 44.7        | 8.8                  | 8.6        | 8.4        | 8.7         | 8.8        | 8.9          | 8.7        |
| YSC-215                 | 45.4                  | ---         | ---         | 51.8        | ---         | ---          | 48.6        | 8.5                  | ---        | ---        | 9.0         | ---        | ---          | 8.7        |
| YSC-268                 | 43.4                  | ---         | ---         | ---         | ---         | ---          | 43.4        | 8.6                  | ---        | ---        | ---         | ---        | ---          | 8.6        |
| YSC-93                  | 43.6                  | ---         | ---         | 48.2        | ---         | ---          | 45.9        | 8.8                  | ---        | ---        | 8.9         | ---        | ---          | 8.8        |
| Appleby CL+             | ---                   | ---         | ---         | ---         | 50.2        | 48.9         | 49.5        | ---                  | ---        | ---        | ---         | 8.4        | 8.7          | 8.6        |
| Devote                  | ---                   | ---         | ---         | ---         | 52.8        | 52.5         | 52.7        | ---                  | ---        | ---        | ---         | 8.6        | 8.9          | 8.8        |
| Eltan                   | ---                   | ---         | ---         | ---         | 54.0        | 54.5         | 54.2        | ---                  | ---        | ---        | ---         | 8.6        | 9.0          | 8.8        |
| Eltan 11-52-0           | ---                   | ---         | ---         | ---         | 54.4        | 54.0         | 54.2        | ---                  | ---        | ---        | ---         | 8.9        | 8.6          | 8.8        |
| Norwest Duet            | ---                   | ---         | ---         | ---         | 53.9        | 52.2         | 53.0        | ---                  | ---        | ---        | ---         | 8.7        | 8.8          | 8.8        |
| ORI2190025 CL+          | ---                   | ---         | ---         | ---         | 51.5        | 49.9         | 50.7        | ---                  | ---        | ---        | ---         | 8.6        | 8.6          | 8.6        |
| ORI2190027CL+           | ---                   | ---         | ---         | ---         | 50.8        | 48.3         | 49.6        | ---                  | ---        | ---        | ---         | 8.2        | 8.9          | 8.5        |
| Otto                    | ---                   | ---         | ---         | ---         | 52.5        | 49.7         | 51.1        | ---                  | ---        | ---        | ---         | 8.5        | 8.9          | 8.7        |
| UIL14-085001A           | ---                   | ---         | ---         | ---         | 54.4        | 51.9         | 53.2        | ---                  | ---        | ---        | ---         | 8.4        | 8.9          | 8.6        |
| UIL16-072025            | ---                   | ---         | ---         | ---         | 57.9        | 55.1         | 56.5        | ---                  | ---        | ---        | ---         | 8.9        | 9.0          | 9.0        |
| UIL16-478001            | ---                   | ---         | ---         | ---         | 55.1        | 50.1         | 52.6        | ---                  | ---        | ---        | ---         | 8.4        | 8.8          | 8.6        |
| WA8334                  | ---                   | ---         | ---         | ---         | 53.9        | 48.6         | 51.3        | ---                  | ---        | ---        | ---         | 8.5        | 8.5          | 8.5        |
| <b>Location average</b> | <b>45.5</b>           | <b>46.9</b> | <b>44.1</b> | <b>49.4</b> | <b>53.3</b> | <b>52.3</b>  | <b>48.9</b> | <b>8.7</b>           | <b>8.9</b> | <b>8.4</b> | <b>8.9</b>  | <b>8.7</b> | <b>8.9</b>   | <b>8.8</b> |

Table 68. Solvent Retention Capacity data for Soft White Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection | Aberdeen |         |        |             | Kimberly |         |        |             | Rupert |         |        |             | Ririe Irrigated |         |        |             | Rockland |         |        |             | Soda Springs |         |        |             |
|----------------------|----------|---------|--------|-------------|----------|---------|--------|-------------|--------|---------|--------|-------------|-----------------|---------|--------|-------------|----------|---------|--------|-------------|--------------|---------|--------|-------------|
|                      | Water    | Sucrose | Na2CO3 | Lactic Acid | Water    | Sucrose | Na2CO3 | Lactic Acid | Water  | Sucrose | Na2CO3 | Lactic Acid | Water           | Sucrose | Na2CO3 | Lactic Acid | Water    | Sucrose | Na2CO3 | Lactic Acid | Water        | Sucrose | Na2CO3 | Lactic Acid |
| AP Exceed            | 49.1     | 84.1    | 61.6   | 64.4        | 49.7     | 86.4    | 63.4   | 58.8        | 51.3   | 96.7    | 67.4   | 85.4        | 49.7            | 85.8    | 66.0   | 59.1        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| AP Iliad             | 48.9     | 89.5    | 61.0   | 65.5        | 49.6     | 90.2    | 63.3   | 67.3        | 50.8   | 98.4    | 67.8   | 82.0        | 50.8            | 87.7    | 63.5   | 62.2        | 50.7     | 99.2    | 80.3   | 87.2        | 50.1         | 86.2    | 70.0   | 75.3        |
| Brundage             | 49.3     | 93.1    | 65.3   | 87.4        | 48.9     | 87.6    | 63.0   | 59.8        | 51.1   | 101.1   | 69.8   | 98.8        | 49.6            | 85.5    | 66.7   | 61.2        | 49.5     | 99.3    | 79.7   | 92.0        | 48.9         | 86.2    | 70.8   | 80.1        |
| IDO1708              | 51.9     | 98.8    | 68.5   | 109.5       | 48.9     | 90.0    | 67.0   | 74.9        | 52.8   | 103.7   | 67.9   | 105.1       | 50.9            | 89.2    | 70.3   | 77.3        | 49.6     | 96.1    | 75.5   | 96.5        | 49.2         | 86.0    | 71.1   | 80.4        |
| IDO2008              | 50.3     | 98.3    | 64.3   | 94.7        | 48.4     | 89.0    | 63.5   | 67.0        | 51.5   | 105.7   | 71.2   | 97.6        | 49.4            | 95.0    | 68.2   | 74.0        | 48.1     | 97.0    | 77.6   | 85.4        | 48.1         | 88.0    | 67.6   | 86.5        |
| LCS Blackjack        | 48.8     | 85.8    | 61.5   | 75.8        | 48.3     | 84.1    | 61.5   | 66.5        | 51.8   | 98.4    | 69.0   | 91.7        | 50.8            | 82.9    | 66.8   | 70.8        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| LCS Hulk             | 52.1     | 96.6    | 67.5   | 84.9        | 47.3     | 86.9    | 60.7   | 67.7        | 53.5   | 107.0   | 72.7   | 95.3        | 50.9            | 91.4    | 66.4   | 75.1        | ---      | ---     | ---    | ---         | 49.3         | 90.7    | 74.6   | 87.0        |
| LWW17-5877           | 50.1     | 94.0    | 64.8   | 92.6        | 49.9     | 90.7    | 62.0   | 76.3        | 51.3   | 100.9   | 66.2   | 102.4       | 51.2            | 91.8    | 66.7   | 78.9        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| M-Press              | 49.2     | 83.7    | 62.5   | 72.5        | 49.9     | 84.6    | 61.9   | 79.0        | 53.8   | 96.7    | 68.6   | 98.5        | 50.9            | 87.0    | 62.5   | 77.5        | 48.6     | 91.3    | 71.5   | 91.1        | 48.8         | 84.8    | 67.5   | 84.7        |
| Norwest Tandem       | 49.3     | 86.8    | 64.1   | 80.3        | 50.9     | 87.0    | 64.6   | 73.0        | 50.7   | 100.5   | 67.4   | 101.1       | 50.3            | 87.1    | 70.3   | 74.1        | 48.7     | 91.5    | 72.1   | 88.5        | 48.9         | 88.1    | 69.1   | 85.0        |
| OR2130755            | 50.3     | 102.5   | 72.0   | 99.0        | 47.7     | 85.8    | 61.2   | 67.0        | 50.4   | 99.8    | 70.3   | 96.3        | 48.2            | 87.7    | 68.0   | 68.2        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| OR2160243            | 49.5     | 95.4    | 64.6   | 86.8        | 49.6     | 85.4    | 62.2   | 66.3        | 53.1   | 104.6   | 71.3   | 102.0       | 49.8            | 88.3    | 71.1   | 77.3        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| OR2160264            | 47.0     | 85.0    | 59.8   | 73.3        | 48.7     | 83.5    | 59.4   | 72.6        | 50.7   | 96.6    | 64.5   | 99.7        | 48.8            | 89.1    | 65.5   | 70.7        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| OR2170559            | 49.7     | 89.5    | 65.7   | 76.3        | 48.6     | 86.2    | 60.1   | 68.9        | 53.4   | 103.4   | 68.2   | 98.3        | 49.6            | 93.1    | 65.7   | 72.6        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| OR2180377            | 50.1     | 90.4    | 64.1   | 80.2        | 49.6     | 84.3    | 61.1   | 68.8        | 52.4   | 98.5    | 69.6   | 89.5        | 50.9            | 89.4    | 69.0   | 77.7        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| Piranha CL+          | 47.8     | 89.0    | 63.3   | 64.7        | 48.1     | 89.2    | 63.0   | 67.5        | 53.2   | 102.5   | 71.8   | 89.5        | 49.8            | 97.2    | 67.8   | 76.0        | 48.5     | 102.7   | 78.3   | 95.3        | 49.2         | 89.8    | 70.4   | 86.5        |
| Sockeye CL+          | 48.8     | 98.9    | 64.6   | 87.1        | 48.6     | 87.3    | 61.9   | 65.4        | 54.6   | 108.7   | 77.1   | 96.4        | 48.6            | 95.3    | 69.6   | 76.2        | 47.8     | 96.4    | 75.5   | 94.0        | 47.5         | 88.4    | 71.8   | 91.3        |
| Stephens             | 49.7     | 85.1    | 62.4   | 67.4        | 49.2     | 86.1    | 61.3   | 61.8        | 54.5   | 99.9    | 64.0   | 95.1        | 50.3            | 90.8    | 62.7   | 71.0        | 49.8     | 90.5    | 72.5   | 90.9        | 48.5         | 83.7    | 65.0   | 73.5        |
| Stingray CL+         | 50.0     | 88.6    | 65.8   | 73.4        | 48.1     | 84.4    | 61.2   | 56.7        | 54.2   | 107.8   | 72.9   | 95.9        | 49.8            | 94.7    | 69.4   | 69.5        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| SY Assure            | 48.6     | 87.6    | 64.5   | 67.1        | 49.9     | 88.9    | 62.8   | 65.3        | 51.2   | 96.3    | 68.7   | 81.0        | 49.3            | 90.3    | 65.0   | 58.7        | 49.0     | 94.0    | 67.0   | 82.9        | 50.2         | 87.4    | 69.0   | 75.6        |
| SY Ovation           | 50.4     | 86.2    | 63.9   | 76.4        | 49.3     | 86.3    | 60.3   | 76.6        | 50.8   | 89.9    | 65.3   | 83.4        | 49.5            | 85.7    | 62.6   | 59.8        | 48.0     | 86.1    | 68.5   | 78.9        | 48.4         | 82.7    | 65.6   | 74.9        |
| UI Magic CL+         | 49.7     | 84.2    | 61.7   | 85.0        | 49.6     | 83.4    | 60.5   | 62.3        | 52.3   | 98.8    | 63.2   | 107.6       | 50.5            | 91.5    | 67.1   | 82.5        | 49.1     | 93.5    | 71.6   | 100.7       | 48.7         | 83.6    | 65.1   | 84.1        |
| UI Sparrow           | 51.3     | 87.4    | 66.5   | 97.8        | 52.3     | 87.4    | 65.4   | 75.0        | 53.2   | 95.0    | 70.4   | 104.0       | 52.0            | 90.8    | 68.8   | 83.7        | 48.5     | 88.4    | 75.3   | 104.4       | 50.2         | 84.4    | 70.8   | 90.5        |
| UIL13-046145A        | 49.7     | 83.0    | 64.7   | 64.7        | 50.6     | 86.6    | 64.3   | 61.5        | 53.2   | 103.8   | 71.6   | 98.2        | 50.4            | 92.6    | 67.6   | 68.9        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| UIL15-028024         | 49.3     | 80.5    | 62.8   | 62.4        | 48.7     | 82.9    | 61.5   | 68.5        | 53.1   | 101.2   | 67.3   | 118.5       | 48.7            | 87.6    | 61.0   | 76.0        | ---      | ---     | ---    | ---         | 49.2         | 84.4    | 67.0   | 89.9        |
| UIL15-423062A        | 51.2     | 88.9    | 68.7   | 80.7        | 49.4     | 85.7    | 61.4   | 65.7        | 54.0   | 108.6   | 70.0   | 116.0       | 50.1            | 93.5    | 68.6   | 81.6        | ---      | ---     | ---    | ---         | 48.0         | 85.9    | 66.1   | 76.1        |
| UIL15-451104B        | 51.1     | 89.8    | 72.2   | 81.9        | 49.7     | 86.1    | 63.6   | 71.7        | 52.5   | 117.0   | 78.0   | 117.3       | 52.0            | 91.3    | 72.7   | 75.8        | ---      | ---     | ---    | ---         | 50.5         | 90.6    | 75.3   | 78.0        |
| VI Presto CL+        | 46.7     | 81.6    | 60.2   | 59.3        | 46.8     | 81.7    | 60.0   | 54.6        | 50.5   | 98.6    | 66.5   | 102.5       | 46.2            | 85.2    | 60.8   | 54.5        | 46.8     | 86.8    | 67.4   | 87.7        | 49.1         | 88.6    | 70.7   | 78.7        |
| VI Shock             | 47.8     | 87.0    | 63.2   | 74.0        | 48.4     | 85.2    | 63.6   | 68.2        | 52.0   | 111.8   | 71.1   | 113.6       | 49.5            | 98.5    | 69.9   | 81.2        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| VI Voodoo CL+        | 51.9     | 91.5    | 69.8   | 102.5       | 48.8     | 88.3    | 62.2   | 86.3        | 50.2   | 102.2   | 70.9   | 111.2       | 50.9            | 97.8    | 74.4   | 95.3        | 49.3     | 97.1    | 72.0   | 114.8       | 49.5         | 94.8    | 70.2   | 98.0        |
| WA8293               | 52.5     | 91.9    | 65.2   | 81.9        | 50.9     | 85.8    | 62.2   | 62.7        | 51.0   | 96.6    | 67.0   | 83.5        | 51.8            | 93.5    | 69.6   | 74.2        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| WB 456               | 51.5     | 89.1    | 64.7   | 83.3        | 49.5     | 83.4    | 62.7   | 61.7        | 49.5   | 92.0    | 67.2   | 88.6        | 50.2            | 86.7    | 64.7   | 61.1        | 48.3     | 92.0    | 73.9   | 89.7        | 48.3         | 89.1    | 66.7   | 81.9        |
| WB1376CLP            | 48.9     | 84.7    | 63.2   | 65.3        | 49.1     | 84.7    | 60.8   | 57.3        | 53.2   | 99.3    | 76.4   | 93.6        | 48.7            | 88.8    | 63.1   | 57.6        | 50.1     | 94.4    | 71.8   | 94.2        | 48.2         | 96.0    | 62.5   | 110.4       |
| WB1529               | 48.0     | 90.1    | 62.2   | 83.0        | 49.4     | 88.9    | 64.2   | 76.1        | 50.6   | 101.3   | 69.9   | 101.5       | 50.6            | 91.4    | 70.2   | 74.7        | 49.3     | 102.9   | 77.1   | 109.7       | 49.9         | 97.1    | 77.7   | 89.8        |
| WB1621               | 47.4     | 85.4    | 62.9   | 77.7        | 49.2     | 85.4    | 60.7   | 68.4        | 51.5   | 105.9   | 76.7   | 109.2       | 47.8            | 87.0    | 67.2   | 68.8        | 48.4     | 98.7    | 75.2   | 107.2       | 50.7         | 92.0    | 73.3   | 82.6        |
| WB1783               | 51.4     | 92.1    | 67.2   | 62.8        | 53.9     | 92.7    | 68.3   | 70.3        | 55.3   | 104.1   | 73.1   | 91.4        | 53.6            | 95.6    | 76.3   | 62.2        | 52.0     | 97.0    | 80.1   | 86.5        | 53.8         | 97.5    | 71.5   | 81.4        |
| YSC-215              | 48.4     | 92.2    | 59.7   | 95.1        | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | 48.2            | 88.2    | 68.0   | 77.4        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| YSC-268              | 48.8     | 90.6    | 63.3   | 71.4        | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| YSC-93               | 50.2     | 87.0    | 63.5   | 78.7        | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | 52.3            | 87.5    | 70.8   | 70.4        | ---      | ---     | ---    | ---         | ---          | ---     | ---    | ---         |
| Appleby CL+          | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 48.6     | 91.5    | 72.1   | 87.4        | 50.2         | 91.0    | 70.5   | 80.9        |
| Devote               | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 51.1     | 109.9   | 80.7   | 100.2       | 50.3         | 107.9   | 78.1   | 106.1       |
| Eltan                | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 49.6     | 108.0   | 79.7   | 118.9       | 49.1         | 98.8    | 74.8   | 101.1       |
| Eltan 11-52-0        | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 50.0     | 104.7   | 79.4   | 118.2       | 49.0         | 108.4   | 76.1   | 117.8       |
| Norwest Duet         | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 49.9     | 94.8    | 77.5   | 98.6        | 48.9         | 90.9    | 75.9   | 86.6        |
| ORI2190025 CL+       | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 54.5     | 103.6   | 81.5   | 107.6       | 48.9         | 95.0    | 73.6   | 94.6        |
| ORI2190027CL+        | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 52.6     | 103.8   | 78.7   | 87.5        | 50.2         | 94.4    | 73.7   | 81.6        |
| Otto                 | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 52.6     | 109.7   | 81.1   | 116.1       | 49.4         | 101.0   | 76.1   | 107.9       |
| UIL14-085001A        | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 49.3     | 99.2    | 75.1   | 82.3        | 49.5         | 92.7    | 74.5   | 82.9        |
| UIL16-072025         | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 50.7     | 104.6   | 82.6   | 100.6       | 48.9         | 96.3    | 75.0   | 94.0        |
| UIL16-478001         | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 51.9     | 103.9   | 79.0   | 97.0        | 49.2         | 92.6    | 70.7   | 88.6        |
| WA8334               | ---      | ---     | ---    | ---         | ---      | ---     | ---    | ---         | ---    | ---     | ---    | ---         | ---             | ---     | ---    | ---         | 54.4     | 109.5   | 87.3   | 115.1       | 51.3         | 103.2   | 73.8   | 108.3       |
| Location average     | 49.7     | 89.4    | 64.4   | 79.2        | 49.3     | 86.5    | 62.4   | 67.7        | 52.2   | 101.5   | 69.8   | 98.4        | 50.1            | 90.3    | 67.5   | 71.9        | 49.9     | 98.1    | 76.2   | 97.1        | 49.4         | 91.6    | 71.2   | 88.1        |

Table 69. Grain Protein & Kernel Hardness of Hard Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection    | -----Grain Protein %----- |             |             |             |              |             | -----Kernel Hardness 0-100----- |           |             |           |              |           |
|-------------------------|---------------------------|-------------|-------------|-------------|--------------|-------------|---------------------------------|-----------|-------------|-----------|--------------|-----------|
|                         | Aberdeen                  | Rupert      | Idaho Falls | Tetonia     | Soda Springs | Average     | Aberdeen                        | Rupert    | Idaho Falls | Tetonia   | Soda Springs | Average   |
| <b>Hard Red Spring</b>  |                           |             |             |             |              |             |                                 |           |             |           |              |           |
| Alum                    | 15.7                      | 16.4        | 16.0        | 14.9        | 15.5         | 15.7        | 95                              | 83        | 75          | 99        | 76           | 86        |
| Dagmar                  | 16.3                      | 16.4        | 16.8        | 15.9        | 15.2         | 16.1        | 113                             | 85        | 96          | 114       | 79           | 98        |
| Espresso                | 16.2                      | 16.0        | 16.0        | 16.1        | 16.3         | 16.1        | 88                              | 86        | 86          | 100       | 85           | 89        |
| Glee                    | 15.4                      | 15.5        | 15.4        | 14.4        | 15.2         | 15.2        | 83                              | 78        | 77          | 94        | 77           | 82        |
| Jefferson HF            | 15.0                      | 15.1        | 15.8        | 14.8        | 15.9         | 15.3        | 83                              | 79        | 87          | 102       | 81           | 87        |
| Net CL+                 | 15.8                      | 15.8        | 15.9        | 15.2        | 15.5         | 15.6        | 93                              | 85        | 81          | 96        | 85           | 88        |
| SY Gunsight             | 14.5                      | 15.0        | 15.0        | 14.1        | ---          | 14.7        | 68                              | 72        | 73          | 85        | ---          | 74        |
| WB9668                  | 16.7                      | 16.8        | 16.4        | 15.3        | 16.6         | 16.4        | 82                              | 77        | 73          | 105       | 85           | 84        |
| WB9707                  | 16.1                      | 16.4        | 16.7        | 15.3        | 16.0         | 16.1        | 85                              | 83        | 87          | 92        | 82           | 86        |
| WB9724CLP               | 16.8                      | 16.4        | 16.8        | 14.9        | 15.2         | 16.0        | 98                              | 79        | 78          | 102       | 84           | 88        |
| WB9879CLP               | 15.9                      | 15.5        | 16.6        | 15.1        | 15.7         | 15.8        | 82                              | 77        | 78          | 88        | 85           | 82        |
| BZ917-221               | 16.1                      | 16.0        | 15.9        | 15.4        | 16.2         | 15.9        | 94                              | 84        | 95          | 99        | 84           | 91        |
| BZ919-101               | 17.6                      | 15.8        | 17.3        | 16.0        | 15.8         | 16.5        | 68                              | 72        | 64          | 84        | 77           | 73        |
| IDO2105S                | 14.7                      | 15.2        | 14.8        | 13.5        | 14.4         | 14.5        | 94                              | 85        | 92          | 106       | 82           | 92        |
| IDO2202CL2              | 15.4                      | 15.0        | 15.0        | 14.9        | 15.1         | 15.1        | 78                              | 88        | 76          | 98        | 85           | 85        |
| MT2063                  | 16.1                      | 15.8        | 15.3        | 15.6        | 15.7         | 15.7        | 85                              | 75        | 82          | 99        | 82           | 84        |
| WA 8356                 | 15.8                      | 15.5        | 15.5        | 14.2        | 14.3         | 15.1        | 79                              | 76        | 60          | 87        | 74           | 75        |
| WA 8357                 | 16.9                      | 17.4        | 17.3        | 15.4        | 16.7         | 16.7        | 88                              | 78        | 84          | 91        | 80           | 84        |
| WA 8359                 | 15.5                      | 15.2        | 15.3        | 14.4        | ---          | 15.1        | 90                              | 101       | 85          | 100       | ---          | 94        |
| WA 8388CL+              | 15.2                      | ---         | 15.3        | 14.1        | 16.8         | 15.4        | 73                              | ---       | 73          | 98        | 89           | 83        |
| IDO2103FHB              | 16.6                      | 16.6        | 16.1        | 14.9        | 14.3         | 15.7        | 71                              | 74        | 76          | 97        | 69           | 77        |
| IDO2104HF               | 15.2                      | 15.2        | 15.3        | 14.5        | 14.2         | 14.9        | 89                              | 90        | 83          | 101       | 88           | 90        |
| Dayn (W)                | 14.8                      | 15.2        | 15.4        | 14.7        | 13.9         | 14.8        | 86                              | 79        | 75          | 96        | 79           | 83        |
| SY-Teton (W)            | 14.9                      | 14.9        | 14.5        | 14.9        | 14.2         | 14.7        | 67                              | 64        | 67          | 83        | 67           | 70        |
| UI Platinum (W)         | 14.6                      | 15.1        | 14.7        | 14.4        | 14.3         | 14.6        | 78                              | 68        | 66          | 88        | 81           | 76        |
| WB7202CLP (W)           | 15.2                      | 15.0        | 14.9        | 13.8        | 15.2         | 14.8        | 80                              | 89        | 86          | 102       | 76           | 86        |
| WB7313 (W)              | 16.1                      | 15.8        | 15.8        | 14.6        | 15.5         | 15.6        | 84                              | 80        | 73          | 98        | 85           | 84        |
| WB7328 (W)              | 15.8                      | 16.2        | 15.2        | 14.4        | 15.8         | 15.5        | 60                              | 67        | 69          | 75        | 68           | 68        |
| WB7589 (W)              | 15.7                      | 15.6        | 15.5        | 14.7        | 15.4         | 15.4        | 85                              | 77        | 79          | 91        | 85           | 83        |
| WB7696 (W)              | 14.9                      | 14.9        | 14.3        | 13.7        | 17.4         | 15.0        | 70                              | 70        | 71          | 87        | 85           | 76        |
| BZ919-059 (W)           | 15.2                      | 14.7        | 15.1        | 14.7        | 15.2         | 15.0        | 68                              | 84        | 62          | 88        | 78           | 76        |
| IDO1804S (W)            | 15.4                      | 15.4        | 15.2        | 13.9        | 15.3         | 15.0        | 90                              | 94        | 88          | 105       | 89           | 93        |
| IDO1904S (W)            | 15.2                      | 15.5        | 15.0        | 14.4        | 15.4         | 15.1        | 87                              | 94        | 87          | 105       | 83           | 91        |
| IDO2002 (W)             | 15.3                      | 15.0        | 14.7        | 13.7        | 14.1         | 14.5        | 69                              | 75        | 78          | 92        | 71           | 77        |
| IDO2004S (W)            | 15.0                      | 14.4        | 14.8        | 14.0        | 13.5         | 14.3        | 76                              | 98        | 73          | 100       | 87           | 87        |
| WA 8330 (W)             | 16.0                      | 16.1        | 16.3        | 15.0        | 14.9         | 15.7        | 69                              | 78        | 73          | 92        | 74           | 77        |
| WA 8342 (W)             | 14.8                      | 14.8        | 14.4        | 14.3        | ---          | 14.5        | 92                              | 88        | 78          | 103       | ---          | 90        |
| WA 8372 (W)             | 15.8                      | 15.2        | 15.4        | 14.0        | ---          | 15.1        | 84                              | 91        | 79          | 107       | ---          | 90        |
| WA 8374 (W)             | 15.3                      | 15.9        | 15.3        | 13.6        | ---          | 15.0        | 90                              | 96        | 91          | 117       | ---          | 99        |
| AP Renegade             | ---                       | ---         | ---         | ---         | 14.4         | 14.4        | ---                             | ---       | ---         | ---       | 91           | 91        |
| Choteau                 | ---                       | ---         | ---         | ---         | 15.4         | 15.4        | ---                             | ---       | ---         | ---       | 86           | 86        |
| Duclair                 | ---                       | ---         | ---         | ---         | 14.9         | 14.9        | ---                             | ---       | ---         | ---       | 80           | 80        |
| MT1939                  | ---                       | ---         | ---         | ---         | 13.9         | 13.9        | ---                             | ---       | ---         | ---       | 77           | 77        |
| Rocker                  | ---                       | ---         | ---         | ---         | 14.4         | 14.4        | ---                             | ---       | ---         | ---       | 108          | 108       |
| <b>Location Average</b> | <b>15.6</b>               | <b>15.6</b> | <b>15.6</b> | <b>14.7</b> | <b>15.2</b>  | <b>15.3</b> | <b>82</b>                       | <b>82</b> | <b>78</b>   | <b>97</b> | <b>81</b>    | <b>85</b> |

(W) = White

Table 70. Percent Flour Protein and Flour Yield of Hard Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection     | Flour Protein (14% mb) |             |             |             |              |             | Flour Yield (%) |             |             |             |              |             |
|--------------------------|------------------------|-------------|-------------|-------------|--------------|-------------|-----------------|-------------|-------------|-------------|--------------|-------------|
|                          | Aberdeen               | Rupert      | Idaho Falls | Tetonia     | Soda Springs | Average     | Aberdeen        | Rupert      | Idaho Falls | Tetonia     | Soda Springs | Average     |
| <b>Hard Red Spring</b>   |                        |             |             |             |              |             |                 |             |             |             |              |             |
| Alum                     | 13.2                   | 13.7        | 13.5        | 12.7        | 12.6         | 13.1        | 74              | 73          | 71          | 71          | 71           | 72          |
| Holmes                   | 13.7                   | 12.5        | 13.7        | 12.6        | 12.6         | 13.0        | 71              | 69          | 73          | 69          | 68           | 70          |
| Dagmar                   | 13.1                   | 13.4        | 14.2        | 13.4        | 12.4         | 13.3        | 72              | 72          | 71          | 70          | 69           | 71          |
| Expresso                 | 14.1                   | 13.3        | 14.0        | 13.0        | 13.8         | 13.6        | 74              | 73          | 71          | 70          | 68           | 71          |
| Glee                     | 12.6                   | 12.9        | 12.8        | 11.6        | 12.2         | 12.4        | 75              | 75          | 71          | 72          | 71           | 73          |
| Jefferson HF             | 12.0                   | 12.4        | 13.3        | 12.5        | 13.6         | 12.8        | 76              | 74          | 72          | 73          | 71           | 73          |
| Net CL+                  | 12.9                   | 13.2        | 13.2        | 13.2        | 12.9         | 13.1        | 74              | 72          | 71          | 71          | 70           | 72          |
| SY Gunsight              | 12.3                   | 12.9        | 12.6        | 11.9        | ---          | 12.4        | 75              | 73          | 72          | 72          | ---          | 73          |
| WB9668                   | 13.6                   | 12.9        | 13.5        | 13.6        | 14.2         | 13.5        | 72              | 70          | 69          | 72          | 70           | 71          |
| WB9707                   | 13.5                   | 14.1        | 14.3        | 12.9        | 13.1         | 13.6        | 74              | 74          | 72          | 75          | 73           | 73          |
| WB9724CLP                | 14.2                   | 14.1        | 13.8        | 13.3        | 12.7         | 13.6        | 72              | 71          | 71          | 72          | 70           | 71          |
| WB9879CLP                | 13.6                   | 13.2        | 14.1        | 12.5        | 13.5         | 13.4        | 72              | 71          | 70          | 71          | 70           | 71          |
| BZ919-101                | 15.0                   | 13.1        | 14.4        | 14.0        | 13.8         | 14.0        | 73              | 72          | 76          | 71          | 70           | 72          |
| IDO2105S                 | 12.5                   | 13.9        | 12.3        | 11.4        | 11.2         | 12.2        | 75              | 72          | 75          | 73          | 71           | 73          |
| IDO2202CL2               | 12.5                   | 12.4        | 12.5        | 12.4        | 12.5         | 12.5        | 75              | 69          | 73          | 71          | 69           | 71          |
| MT2063                   | 13.5                   | 12.5        | 11.9        | 13.2        | 11.3         | 12.5        | 71              | 67          | 71          | 68          | 67           | 69          |
| WA 8356                  | 13.4                   | 12.9        | 12.4        | 12.1        | 11.8         | 12.5        | 75              | 73          | 75          | 73          | 71           | 74          |
| WA 8357                  | 15.3                   | 13.0        | 15.3        | 12.6        | 14.4         | 14.1        | 74              | 71          | 73          | 71          | 69           | 72          |
| WA 8359                  | 12.5                   | 14.9        | 11.8        | 12.0        | ---          | 12.8        | 71              | 68          | 71          | 69          | ---          | 70          |
| WA 8388CL+               | 13.1                   | ---         | 12.3        | 11.8        | 14.2         | 12.8        | 73              | ---         | 73          | 72          | 68           | 72          |
| IDO2103FHB               | 13.8                   | 13.9        | 13.4        | 12.2        | 11.6         | 13.0        | 75              | 75          | 76          | 74          | 69           | 74          |
| IDO2104HF                | 12.5                   | 12.0        | 11.9        | 12.0        | 11.3         | 11.9        | 74              | 73          | 73          | 73          | 68           | 72          |
| AP Renegade              | ---                    | ---         | ---         | ---         | 11.4         | 11.4        | ---             | ---         | ---         | ---         | 69           | 69          |
| Choteau                  | ---                    | ---         | ---         | ---         | 12.3         | 12.3        | ---             | ---         | ---         | ---         | 71           | 71          |
| Duclair                  | ---                    | ---         | ---         | ---         | 12.5         | 12.5        | ---             | ---         | ---         | ---         | 71           | 71          |
| MT1939                   | ---                    | ---         | ---         | ---         | 11.3         | 11.3        | ---             | ---         | ---         | ---         | 69           | 69          |
| Rocker                   | ---                    | ---         | ---         | ---         | 12.1         | 12.1        | ---             | ---         | ---         | ---         | 71           | 71          |
| <b>Location Average</b>  | <b>13.3</b>            | <b>13.2</b> | <b>13.2</b> | <b>12.6</b> | <b>12.6</b>  | <b>13.0</b> | <b>73</b>       | <b>72</b>   | <b>72</b>   | <b>71</b>   | <b>70</b>    | <b>72</b>   |
| <b>Hard White Spring</b> |                        |             |             |             |              |             |                 |             |             |             |              |             |
| Dayn (W)                 | 12.2                   | 13.5        | 13.1        | 12.5        | 11.1         | 12.5        | 74              | 73          | 72          | 73          | 70           | 72          |
| SY-Teton (W)             | 12.1                   | 12.8        | 12.1        | 12.8        | 11.5         | 12.2        | 73              | 72          | 72          | 73          | 68           | 72          |
| UI Platinum (W)          | 12.3                   | 12.0        | 12.6        | 11.9        | 10.8         | 11.9        | 75              | 74          | 73          | 74          | 70           | 73          |
| WB7202CLP (W)            | 12.5                   | 13.0        | 12.1        | 12.0        | 12.0         | 12.3        | 71              | 69          | 69          | 70          | 66           | 69          |
| WB7313 (W)               | 13.5                   | 12.8        | 12.8        | 12.1        | 12.0         | 12.6        | 73              | 71          | 70          | 71          | 66           | 70          |
| WB7328 (W)               | 13.3                   | 13.4        | 13.0        | 11.8        | 12.7         | 12.8        | 73              | 71          | 70          | 70          | 67           | 70          |
| WB7589 (W)               | 13.1                   | 13.9        | 12.9        | 12.5        | 12.2         | 12.9        | 72              | 70          | 71          | 72          | 68           | 70          |
| WB7696 (W)               | 12.1                   | 13.4        | 11.7        | 11.1        | 14.3         | 12.5        | 75              | 71          | 77          | 73          | 69           | 73          |
| BZ919-059 (W)            | 12.8                   | 12.6        | 11.7        | 12.4        | 12.1         | 12.3        | 74              | 72          | 75          | 72          | 68           | 72          |
| IDO1804S (W)             | 12.0                   | 12.4        | 12.5        | 11.8        | 12.4         | 12.2        | 73              | 70          | 73          | 72          | 69           | 71          |
| IDO1904S (W)             | 11.7                   | 12.9        | 12.3        | 11.5        | 12.1         | 12.1        | 73              | 74          | 74          | 72          | 67           | 72          |
| IDO2002 (W)              | 12.4                   | 12.5        | 12.0        | 11.0        | 11.5         | 11.9        | 73              | 74          | 73          | 72          | 69           | 72          |
| IDO2004S (W)             | 12.2                   | 11.4        | 12.0        | 12.0        | 10.7         | 11.7        | 74              | 75          | 75          | 75          | 69           | 74          |
| WA 8330 (W)              | 13.0                   | 13.5        | 13.5        | 12.4        | 12.3         | 12.9        | 73              | 73          | 72          | 72          | 68           | 72          |
| WA 8342 (W)              | 12.7                   | 12.3        | 11.7        | 12.2        | ---          | 12.2        | 72              | 72          | 73          | 72          | ---          | 72          |
| WA 8372 (W)              | 13.7                   | 12.9        | 12.3        | 12.2        | ---          | 12.8        | 73              | 72          | 73          | 73          | ---          | 73          |
| WA 8374 (W)              | 13.2                   | 12.9        | 12.5        | 11.4        | ---          | 12.5        | 71              | 71          | 72          | 71          | ---          | 71          |
| <b>Location Average</b>  | <b>12.6</b>            | <b>12.8</b> | <b>12.4</b> | <b>12.0</b> | <b>12.0</b>  | <b>12.4</b> | <b>73.2</b>     | <b>71.9</b> | <b>72.6</b> | <b>72.1</b> | <b>68.2</b>  | <b>71.8</b> |

mb = moisture basis

Table 71. Bake Volume of Hard Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selectio            | Bake Volume (cc) |             |             |            |              | Average     |
|--------------------------------|------------------|-------------|-------------|------------|--------------|-------------|
|                                | Aberdeen         | Rupert      | Idaho Falls | Tetonia    | Soda Springs |             |
| <b>Hard Red Spring Wheat</b>   |                  |             |             |            |              |             |
| Alum                           | 1075             | 1225        | 1075        | 975        | 975          | <b>1065</b> |
| Dagmar                         | 925              | 1175        | 1125        | 1050       | 1000         | <b>1055</b> |
| Espresso                       | 975              | 1125        | 950         | 875        | 1050         | <b>995</b>  |
| Glee                           | 1000             | 1225        | 1050        | 900        | 1025         | <b>1040</b> |
| Holmes                         | 1100             | 1150        | 1025        | 975        | 1025         | <b>1055</b> |
| Jefferson HF                   | 950              | 1175        | 1025        | 875        | 1050         | <b>1015</b> |
| Net CL+                        | 1000             | 1200        | 950         | 875        | 975          | <b>1000</b> |
| SY Gunsight                    | 1025             | 1000        | 1050        | 900        | ---          | <b>994</b>  |
| WB9668                         | 1150             | 1200>       | 1075        | 1025       | 1050         | <b>1075</b> |
| WB9707                         | 1050             | 1200        | 1100        | 925        | 1025         | <b>1060</b> |
| WB9724CLP                      | 1100             | 1200        | 1075        | 925        | 1025         | <b>1065</b> |
| WB9879CLP                      | 925              | 1025        | 925         | 775        | 1025         | <b>935</b>  |
| BZ919-101                      | 1200             | 1200        | >1200       | 1200       | 1100         | <b>1175</b> |
| IDO2103FHB                     | >1200            | 1100        | >1200       | 1050       | 1000         | <b>1050</b> |
| IDO2104HF                      | 1150             | 1050        | 1075        | 975        | 975          | <b>1045</b> |
| IDO2105S                       | 1025             | 1175        | 1075        | 1025       | 975          | <b>1055</b> |
| IDO2202CL2                     | 1100             | 1100        | 1000        | 1075       | 1050         | <b>1065</b> |
| MT2063                         | 1100             | 950         | 925         | 1000       | 1050         | <b>1005</b> |
| WA 8356                        | 1150             | 1100        | 1025        | 1000       | 1025         | <b>1060</b> |
| WA 8357                        | >1200            | 1125        | 1150        | 1075       | 1225         | <b>1144</b> |
| WA 8359                        | 1000             | 900         | 875         | 825        | ---          | <b>900</b>  |
| WA 8388CL+                     | 1050             | ---         | 1100        | 975        | 1100         | <b>1056</b> |
| AP Renegade                    | ---              | ---         | ---         | ---        | 825          | <b>825</b>  |
| Choteau                        | ---              | ---         | ---         | ---        | 950          | <b>950</b>  |
| Duclair                        | ---              | ---         | ---         | ---        | 1000         | <b>1000</b> |
| MT1939                         | ---              | ---         | ---         | ---        | 850          | <b>850</b>  |
| Rocker                         | ---              | ---         | ---         | ---        | 925          | <b>925</b>  |
| <b>Location Average</b>        | <b>1053</b>      | <b>1120</b> | <b>1033</b> | <b>967</b> | <b>1011</b>  | <b>1017</b> |
| <b>Hard White Spring Wheat</b> |                  |             |             |            |              |             |
| Dayn (W)                       | 1025             | 1250        | 1025        | 950        | 1000         | <b>1050</b> |
| SY-Teton (W)                   | 1050             | 1050        | 975         | 1075       | 1025         | <b>1035</b> |
| UI Platinum (W)                | 1125             | 1200        | 925         | 975        | 1075         | <b>1060</b> |
| WB7202CLP (W)                  | 1100             | 1175        | 975         | 950        | 1050         | <b>1050</b> |
| WB7313 (W)                     | 1175             | 1025        | 1075        | 1050       | 1050         | <b>1075</b> |
| WB7328 (W)                     | >1200            | 1200        | 1050        | 1050       | 1250         | <b>1138</b> |
| WB7589 (W)                     | >1200            | 1100        | 1025        | 1000       | 1125         | <b>1063</b> |
| WB7696 (W)                     | 1150             | 1250        | 1050        | 1025       | 1275         | <b>1150</b> |
| BZ919-059 (W)                  | 1175             | 1050        | 1000        | 1100       | 1125         | <b>1090</b> |
| IDO1804S (W)                   | 1050             | 1025        | 1000        | 875        | 1025         | <b>995</b>  |
| IDO1904S (W)                   | 1100             | 1175        | 1050        | 1050       | 1150         | <b>1105</b> |
| IDO2002 (W)                    | 1050             | 950         | 1000        | 925        | 1025         | <b>990</b>  |
| IDO2004S (W)                   | 1150             | 1075        | 1000        | 925        | 1000         | <b>1030</b> |
| WA 8330 (W)                    | 1175             | 1100        | 1100        | 1000       | 800          | <b>1035</b> |
| WA 8342 (W)                    | 1025             | 975         | 950         | 875        | ---          | <b>956</b>  |
| WA 8372 (W)                    | 1075             | 1000        | 925         | 900        | ---          | <b>975</b>  |
| WA 8374 (W)                    | 1075             | 1025        | 950         | 825        | ---          | <b>969</b>  |
| <b>Location Average</b>        | <b>1100</b>      | <b>1096</b> | <b>1004</b> | <b>974</b> | <b>1070</b>  | <b>1045</b> |

Table 72. Grain Protein &amp; Kernel Hardness of Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho , 2022.

| Variety or Selection    | -----Grain Protein %----- |             |             |             |              |             | -----Kernel Hardness 0-100----- |             |             |             |              |             |
|-------------------------|---------------------------|-------------|-------------|-------------|--------------|-------------|---------------------------------|-------------|-------------|-------------|--------------|-------------|
|                         | Aberdeen                  | Rupert      | Idaho Falls | Tetonia     | Soda Springs | Average     | Aberdeen                        | Rupert      | Idaho Falls | Tetonia     | Soda Springs | Average     |
| Alturas                 | 11.6                      | 12.7        | 12.6        | 11.0        | 11.7         | <b>11.9</b> | 14                              | 26          | 22          | 32          | 26           | <b>24</b>   |
| Hedge CL+               | 12.2                      | 12.9        | 13.7        | 11.8        | 12.4         | <b>12.6</b> | 38                              | 41          | 37          | 44          | 34           | <b>39</b>   |
| IDO1404S                | 11.9                      | 12.5        | 11.8        | 11.4        | 11.9         | <b>11.9</b> | 25                              | 26          | 30          | 41          | 20           | <b>29</b>   |
| IDO1702S                | 11.9                      | 12.9        | 12.2        | 10.4        | 12.0         | <b>11.9</b> | 25                              | 23          | 18          | 32          | 20           | <b>24</b>   |
| IDO1902S                | 11.7                      | 12.3        | 12.4        | 10.7        | 12.0         | <b>11.8</b> | 41                              | 32          | 33          | 34          | 24           | <b>33</b>   |
| IDO2101FHB              | 12.1                      | 13.1        | 13.1        | 10.8        | 12.4         | <b>12.3</b> | 26                              | 25          | 18          | 42          | 23           | <b>27</b>   |
| Louise                  | 12.3                      | 12.3        | ---         | ---         | 11.9         | <b>12.2</b> | 24                              | 33          | ---         | ---         | 33           | <b>30</b>   |
| Melba                   | 10.7                      | 11.9        | 11.9        | 10.7        | 12.5         | <b>11.5</b> | 28                              | 35          | 22          | 40          | 35           | <b>32</b>   |
| Ryan                    | 13.1                      | 13.1        | 12.6        | 11.0        | 11.9         | <b>12.3</b> | 23                              | 25          | 29          | 40          | 28           | <b>29</b>   |
| Seahawk                 | 11.2                      | 12.7        | 12.9        | 10.8        | 12.6         | <b>12.1</b> | 26                              | 32          | 26          | 40          | 33           | <b>31</b>   |
| Tekoa                   | 11.8                      | 12.3        | 12.6        | 10.3        | 12.1         | <b>11.8</b> | 36                              | 17          | 27          | 29          | 30           | <b>28</b>   |
| TMC 2021                | 11.5                      | ---         | 13.1        | 10.9        | ---          | <b>11.9</b> | 40                              | ---         | 25          | 37          | ---          | <b>34</b>   |
| UI Cookie               | 12.1                      | 12.2        | 12.2        | 11.2        | 13.3         | <b>12.2</b> | 34                              | 29          | 26          | 31          | 29           | <b>30</b>   |
| UI Stone                | 11.3                      | 11.8        | 12.2        | 10.8        | 11.9         | <b>11.6</b> | 35                              | 17          | 12          | 33          | 21           | <b>24</b>   |
| WA 8327                 | 11.6                      | 12.4        | 12.3        | 10.3        | 11.7         | <b>11.7</b> | 35                              | 31          | 31          | 32          | 22           | <b>30</b>   |
| WA 8351                 | 11.8                      | 12.2        | 12.6        | 10.2        | 11.3         | <b>11.6</b> | 41                              | 29          | 21          | 47          | 22           | <b>32</b>   |
| WA 8354CL+              | 11.9                      | 12.9        | 12.5        | 10.8        | 12.1         | <b>12.0</b> | 25                              | 28          | 21          | 31          | 21           | <b>25</b>   |
| WB6211CLP               | 12.8                      | 13.4        | 13.5        | 11.2        | 12.8         | <b>12.7</b> | 28                              | 32          | 32          | 38          | 32           | <b>32</b>   |
| WB6430                  | 11.6                      | 12.1        | 11.7        | 10.6        | 12.3         | <b>11.7</b> | 38                              | 24          | 20          | 28          | 27           | <b>28</b>   |
| YSC-603                 | 12.4                      | ---         | 13.8        | 11.0        | ---          | <b>12.4</b> | 76                              | ---         | 55          | 104         | ---          | <b>78</b>   |
| AP Coachman             | ---                       | ---         | ---         | ---         | 11.8         | <b>11.8</b> | ---                             | ---         | ---         | ---         | 34           | <b>34</b>   |
| <b>Location Average</b> | <b>11.9</b>               | <b>12.5</b> | <b>12.6</b> | <b>10.8</b> | <b>12.1</b>  | <b>12.0</b> | <b>32.8</b>                     | <b>28.1</b> | <b>26.6</b> | <b>39.7</b> | <b>27.0</b>  | <b>32.0</b> |

Table 73. Percent Flour Protein and Flour Yield of Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection    | Flour Protein (14% mb) |            |             |            |              |            | Flour Yield (%) |           |             |           |              |           |
|-------------------------|------------------------|------------|-------------|------------|--------------|------------|-----------------|-----------|-------------|-----------|--------------|-----------|
|                         | Aberdeen               | Rupert     | Idaho Falls | Tetonia    | Soda Springs | Average    | Aberdeen        | Rupert    | Idaho Falls | Tetonia   | Soda Springs | Average   |
| Alturas                 | 8.9                    | 10.3       | 9.9         | 8.8        | 9.8          | 9.5        | 76              | 77        | 75          | 74        | 74           | 75        |
| Hedge CL+               | 9.6                    | 10.4       | 10.9        | 9.4        | 9.5          | 9.9        | 75              | 76        | 73          | 73        | 72           | 74        |
| IDO1404S                | 9.0                    | 9.8        | 9.7         | 8.7        | 9.1          | 9.3        | 75              | 75        | 76          | 74        | 73           | 74        |
| IDO1702S                | 9.9                    | 10.1       | 9.3         | 8.0        | 9.3          | 9.3        | 74              | 72        | 74          | 73        | 71           | 73        |
| IDO1902S                | 9.5                    | 9.2        | 9.9         | 8.0        | 9.5          | 9.2        | 77              | 76        | 76          | 74        | 72           | 75        |
| IDO2101FHB              | 9.8                    | 10.5       | 9.8         | 8.2        | 8.8          | 9.4        | 75              | 73        | 73          | 72        | 69           | 72        |
| Louise                  | 9.3                    | 9.8        | ---         | ---        | 9.9          | 9.7        | 75              | 77        | ---         | ---       | 72           | 75        |
| Melba                   | 8.5                    | 9.4        | 9.2         | 8.2        | 9.2          | 8.9        | 77              | 76        | 76          | 76        | 74           | 75        |
| Ryan                    | 10.2                   | 10.2       | 9.2         | 8.3        | 9.7          | 9.5        | 74              | 75        | 74          | 75        | 73           | 74        |
| Seahawk                 | 8.5                    | 10.1       | 9.9         | 8.4        | 9.0          | 9.2        | 76              | 75        | 74          | 75        | 74           | 75        |
| Tekoa                   | 9.2                    | 9.8        | 10.0        | 7.7        | 10.3         | 9.4        | 77              | 77        | 75          | 76        | 75           | 76        |
| TMC 2021                | 9.0                    | ---        | 9.9         | 8.4        | ---          | 9.1        | 76              | ---       | 75          | 75        | ---          | 75        |
| UI Cookie               | 9.3                    | 9.7        | 10.0        | 8.5        | 9.3          | 9.4        | 72              | 73        | 73          | 73        | 69           | 72        |
| UI Stone                | 8.9                    | 9.4        | 9.4         | 8.4        | 9.8          | 9.2        | 76              | 76        | 76          | 76        | 72           | 75        |
| WA 8327                 | 9.1                    | 9.9        | 9.7         | 7.7        | 8.6          | 9.0        | 76              | 74        | 75          | 75        | 72           | 74        |
| WA 8351                 | 9.2                    | 9.6        | 9.6         | 7.6        | 9.4          | 9.1        | 78              | 75        | 76          | 75        | 72           | 75        |
| WA 8354CL+              | 9.6                    | 10.1       | 10.2        | 8.2        | 9.0          | 9.4        | 75              | 73        | 74          | 73        | 71           | 73        |
| WB6211CLP               | 10.1                   | 10.6       | 11.0        | 8.6        | 9.5          | 9.9        | 71              | 72        | 72          | 70        | 69           | 71        |
| WB6430                  | 9.0                    | 9.5        | 9.1         | 8.1        | 9.1          | 9.0        | 74              | 75        | 76          | 75        | 71           | 74        |
| YSC-603                 | 10.0                   | ---        | 10.9        | 8.6        | ---          | 9.8        | 77              | ---       | 74          | 72        | ---          | 74        |
| AP Coachman             | ---                    | ---        | ---         | ---        | 9.7          | 9.7        | ---             | ---       | ---         | ---       | 72           | 72        |
| <b>Location Average</b> | <b>9.3</b>             | <b>9.9</b> | <b>9.9</b>  | <b>8.3</b> | <b>9.4</b>   | <b>9.4</b> | <b>75</b>       | <b>75</b> | <b>75</b>   | <b>74</b> | <b>72</b>    | <b>74</b> |

mb = Moisture basis

Table 74. Percent Break Flour and Cookie Diameter of Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection    | Break Flour (%) |           |             |           |              |           | Cookie Diameter (cm) |            |             |            |            |
|-------------------------|-----------------|-----------|-------------|-----------|--------------|-----------|----------------------|------------|-------------|------------|------------|
|                         | Aberdeen        | Rupert    | Idaho Falls | Tetonia   | Soda Springs | Average   | Aberdeen             | Rupert     | Idaho Falls | Tetonia    | Average    |
| Alturas                 | 48              | 50        | 44          | 42        | 46           | 46        | 8.8                  | 8.9        | 8.4         | 8.6        | 8.7        |
| Hedge CL+               | 46              | 49        | 44          | 42        | 43           | 45        | 9.1                  | 9.3        | 8.9         | 9.1        | 9.1        |
| IDO1404S                | 47              | 49        | 48          | 44        | 43           | 46        | 9.2                  | 9.2        | 9.1         | 9.0        | 9.1        |
| IDO1702S                | 49              | 48        | 47          | 44        | 45           | 47        | 8.6                  | 8.6        | 8.4         | 8.6        | 8.5        |
| IDO1902S                | 49              | 49        | 47          | 45        | 45           | 47        | 9.0                  | 9.2        | 8.9         | 9.0        | 9.0        |
| IDO2101FHB              | 50              | 46        | 46          | 41        | 44           | 45        | 8.7                  | 9.0        | 8.8         | 9.2        | 8.9        |
| Louise                  | 47              | 50        | ---         | ---       | 45           | 47        | 9.3                  | 9.4        | ---         | ---        | 9.3        |
| Melba                   | 49              | 51        | 48          | 46        | 45           | 48        | 9.2                  | 9.3        | 9.3         | 9.4        | 9.3        |
| Ryan                    | 47              | 50        | 46          | 43        | 46           | 46        | 8.8                  | 8.8        | 8.6         | 8.9        | 8.8        |
| Seahawk                 | 47              | 50        | 46          | 44        | 44           | 46        | 9.1                  | 8.8        | 8.7         | 8.8        | 8.9        |
| Tekoa                   | 48              | 52        | 49          | 45        | 46           | 48        | 9.3                  | 9.1        | 8.8         | 9.1        | 9.1        |
| TMC 2021                | 46              | ---       | 45          | 42        | ---          | 44        | 9.3                  | ---        | 8.6         | 8.9        | 8.9        |
| UI Cookie               | 46              | 50        | 46          | 45        | 43           | 46        | 8.9                  | 9.2        | 8.7         | 8.9        | 8.9        |
| UI Stone                | 48              | 51        | 51          | 47        | 47           | 49        | 9.1                  | 9.0        | 8.5         | 9.1        | 8.9        |
| WA 8327                 | 51              | 50        | 50          | 45        | 46           | 48        | 9.3                  | 9.1        | 8.8         | 9.1        | 9.1        |
| WA 8351                 | 49              | 50        | 49          | 44        | 45           | 47        | 9.1                  | 9.2        | 9.0         | 9.1        | 9.1        |
| WA 8354CL+              | 51              | 51        | 50          | 46        | 45           | 49        | 9.0                  | 8.8        | 8.6         | 9.2        | 8.9        |
| WB6211CLP               | 45              | 46        | 45          | 39        | 43           | 44        | 8.7                  | 8.7        | 8.3         | 8.7        | 8.6        |
| WB6430                  | 47              | 50        | 50          | 46        | 43           | 47        | 9.3                  | 9.2        | 9.2         | 9.3        | 9.3        |
| YSC-603                 | 37              | ---       | 32          | 29        | ---          | 33        | 8.1                  | ---        | 7.8         | 7.9        | 7.9        |
| AP Coachman             | ---             | ---       | ---         | ---       | 41           | 41        | ---                  | ---        | ---         | ---        | ---        |
| <b>Location Average</b> | <b>47</b>       | <b>50</b> | <b>46</b>   | <b>43</b> | <b>45</b>    | <b>46</b> | <b>9.0</b>           | <b>9.0</b> | <b>8.7</b>  | <b>8.9</b> | <b>8.9</b> |

Table 75. Solvent Retention Capacity data for Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2022.

| Variety or Selection    | Aberdeen    |             |             |             | Rupert      |             |             |             | Idaho Falls |             |             |             |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                         | Water       | Sucrose     | Na2CO3      | LacticAcid  | Water       | Sucrose     | Na2CO3      | LacticAcid  | Water       | Sucrose     | Na2CO3      | LacticAcid  |
| Alturas                 | 48.2        | 86.7        | 64.1        | 86.3        | 50.7        | 89.7        | 74.5        | 89.7        | 50.2        | 89.9        | 67.8        | 99.7        |
| Hedge CL+               | 48.7        | 81.3        | 65.0        | 64.1        | 49.8        | 84.7        | 72.3        | 62.7        | 50.3        | 84.9        | 69.2        | 70.9        |
| IDO1404S                | 46.8        | 81.3        | 58.8        | 62.3        | 47.3        | 84.7        | 63.2        | 68.8        | 48.6        | 85.8        | 71.1        | 69.3        |
| IDO1702S                | 51.1        | 99.0        | 71.8        | 98.2        | 51.2        | 102.7       | 73.3        | 99.8        | 50.8        | 97.1        | 72.6        | 94.4        |
| IDO1902S                | 48.5        | 84.7        | 64.1        | 80.9        | 48.4        | 86.7        | 67.6        | 90.3        | 48.9        | 88.5        | 69.3        | 92.7        |
| IDO2101FHB              | 48.7        | 90.4        | 68.4        | 93.9        | 48.7        | 91.9        | 68.1        | 101.0       | 49.5        | 94.3        | 69.6        | 105.3       |
| Louise                  | 47.5        | 83.9        | 61.7        | 85.4        | 49.7        | 85.5        | 74.1        | 83.6        | ---         | ---         | ---         | ---         |
| Melba                   | 47.4        | 77.6        | 60.5        | 56.4        | 49.1        | 79.7        | 68.9        | 65.9        | 49.6        | 79.3        | 65.1        | 66.7        |
| Ryan                    | 49.0        | 86.6        | 61.8        | 81.1        | 50.1        | 87.7        | 66.4        | 78.3        | 50.1        | 87.6        | 65.0        | 83.1        |
| Seahawk                 | 48.5        | 83.3        | 66.7        | 64.7        | 50.5        | 90.7        | 76.0        | 77.8        | 49.2        | 87.9        | 69.0        | 77.2        |
| Tekoa                   | 45.8        | 80.8        | 62.3        | 72.6        | 47.4        | 88.2        | 71.4        | 83.5        | 46.2        | 85.7        | 62.7        | 91.7        |
| TMC 2021                | 49.4        | 83.3        | 58.8        | 69.0        | ---         | ---         | ---         | ---         | 49.9        | 86.9        | 67.3        | 89.6        |
| UI Cookie               | 47.1        | 86.3        | 67.1        | 79.4        | 48.3        | 91.5        | 67.3        | 91.3        | 48.8        | 89.9        | 66.4        | 97.4        |
| UI Stone                | 46.6        | 82.4        | 59.4        | 77.9        | 47.8        | 86.5        | 66.3        | 86.9        | 49.0        | 86.5        | 67.9        | 91.1        |
| WA 8327                 | 51.0        | 86.5        | 66.2        | 78.3        | 49.4        | 89.9        | 64.5        | 88.9        | 49.3        | 87.8        | 70.0        | 87.2        |
| WA 8351                 | 48.7        | 86.2        | 64.5        | 85.5        | 47.8        | 87.6        | 62.6        | 90.5        | 48.2        | 88.3        | 68.5        | 92.9        |
| WA 8354CL+              | 49.8        | 91.5        | 71.2        | 74.8        | 47.6        | 96.3        | 68.5        | 91.9        | 49.3        | 95.5        | 71.8        | 87.8        |
| WB6211CLP               | 50.2        | 94.2        | 73.4        | 69.6        | 52.0        | 97.8        | 79.0        | 76.7        | 54.5        | 103.0       | 82.1        | 81.5        |
| WB6430                  | 46.9        | 80.8        | 59.9        | 53.7        | 48.5        | 85.0        | 66.2        | 62.3        | 48.7        | 84.9        | 67.9        | 62.4        |
| YSC-603                 | 57.1        | 84.4        | 69.5        | 84.1        | ---         | ---         | ---         | ---         | 62.0        | 92.5        | 84.1        | 96.3        |
| AP Coachman             | ---         | ---         | ---         | ---         | ---         | ---         | ---         | ---         | ---         | ---         | ---         | ---         |
| <b>Location average</b> | <b>48.8</b> | <b>85.6</b> | <b>64.8</b> | <b>75.9</b> | <b>49.1</b> | <b>89.3</b> | <b>69.5</b> | <b>82.8</b> | <b>50.2</b> | <b>89.3</b> | <b>69.9</b> | <b>86.2</b> |

| Variety or Selection    | Tetonia     |             |             |             | Soda Springs |             |             |             |
|-------------------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
|                         | Water       | Sucrose     | Na2CO3      | LacticAcid  | Water        | Sucrose     | Na2CO3      | LacticAcid  |
| Alturas                 | 50.2        | 87.1        | 64.7        | 88.2        | 54.2         | 94.7        | 88.1        | 91.5        |
| Hedge CL+               | 50.3        | 83.0        | 68.4        | 62.2        | 49.4         | 84.1        | 70.2        | 72.8        |
| IDO1404S                | 48.7        | 84.1        | 63.6        | 58.9        | 47.4         | 83.5        | 63.1        | 77.4        |
| IDO1702S                | 51.8        | 91.9        | 70.0        | 82.9        | 49.7         | 93.5        | 73.3        | 105.5       |
| IDO1902S                | 50.9        | 82.8        | 64.7        | 78.6        | 48.7         | 85.6        | 67.8        | 112.6       |
| IDO2101FHB              | 51.2        | 88.4        | 66.6        | 87.0        | 49.4         | 94.6        | 72.5        | 115.2       |
| Louise                  | ---         | ---         | ---         | ---         | 50.3         | 86.6        | 71.3        | 101.1       |
| Melba                   | 49.5        | 79.1        | 64.6        | 57.9        | 49.4         | 82.7        | 67.2        | 70.5        |
| Ryan                    | 50.8        | 84.6        | 65.5        | 67.6        | 49.4         | 86.2        | 71.6        | 88.5        |
| Seahawk                 | 50.6        | 85.0        | 68.6        | 63.4        | 50.3         | 86.8        | 77.6        | 89.1        |
| Tekoa                   | 48.8        | 81.0        | 62.4        | 74.4        | 48.9         | 84.2        | 67.8        | 90.4        |
| TMC 2021                | 50.2        | 84.7        | 65.6        | 70.9        | ---          | ---         | ---         | ---         |
| UI Cookie               | 49.6        | 86.0        | 66.9        | 79.7        | 49.1         | 93.1        | 69.7        | 111.1       |
| UI Stone                | 47.8        | 84.1        | 63.7        | 85.6        | 47.8         | 88.6        | 71.6        | 110.2       |
| WA 8327                 | 50.9        | 83.6        | 66.2        | 75.8        | 49.1         | 88.0        | 67.7        | 102.3       |
| WA 8351                 | 50.3        | 81.9        | 63.5        | 72.6        | 49.1         | 87.5        | 67.0        | 101.9       |
| WA 8354CL+              | 50.7        | 85.9        | 68.9        | 74.9        | 49.5         | 93.1        | 75.4        | 102.4       |
| WB6211CLP               | 51.6        | 92.9        | 75.2        | 76.2        | 50.4         | 97.1        | 80.7        | 93.1        |
| WB6430                  | 50.2        | 81.6        | 66.7        | 59.6        | 48.0         | 85.1        | 62.0        | 73.4        |
| YSC-603                 | 64.4        | 88.7        | 80.9        | 90.6        | ---          | ---         | ---         | ---         |
| AP Coachman             | ---         | ---         | ---         | ---         | 51.7         | 90.9        | 70.9        | 84.8        |
| <b>Location average</b> | <b>51.0</b> | <b>85.1</b> | <b>67.2</b> | <b>74.1</b> | <b>49.6</b>  | <b>88.7</b> | <b>71.4</b> | <b>94.4</b> |

**Addendum 1a. Resistance reaction of hard winter wheat varieties in a heavily inoculated dwarf bunt (*Tilletia controversa*) nursery, Logan, UT, 2022 and 2023 data. Thanks to our cooperator Dr. Margaret Krause, Utah State University.**

|                             | 2022             | 2022             | 2023             |  |
|-----------------------------|------------------|------------------|------------------|--|
| Wheat Variety               | Disease Reaction | Bunted Heads (%) | Bunted Heads (%) |  |
| Promontory                  | VR               | 0                | 20               | <b>Bunted Head (%) Disease Reaction</b><br>0 VR = very resistant<br>1 to 3 R = resistant<br>4 to 6 MR = moderately resistant<br>7 to 15 MS = moderately susceptible<br>>15 S = susceptible |
| UI Silver                   | VR               | 0                | 20               |  |
| UI SRG                      | VR               | 0                | 22.5             |  |
| Golden Spike (W)            | R                | 0.5              | 30               |  |
| IDO1906 (W)                 | R                | 1                | ---              |  |
| LCS Jet                     | MS               | 9                | 90               |  |
| Keldin                      | MS               | 11               | 90               | Results of 2023 are not characteristic of variety phenotype. Excellent environmental conditions resulted in overwhelming any host resistance.  |
| UI Bronze Jade (W)          | MS               | 11               | 45               |  |
| Sequoia                     | MS               | 12.5             | 30               |  |
| LCS Rocket                  | MS               | 13.5             | 100              |  |
| Keldin + 11-52-0            | MS               | 15               | 87.5             |  |
| OR2170052H (W)              | S                | 17.5             | ---              |  |
| OR2170199R                  | S                | 22.5             | ---              |  |
| IDO2006 (W)                 | S                | 25               | 95               |  |
| MT1745                      | S                | 30               | 20               |  |
| Irv (W)                     | S                | 32.5             | 90               |  |
| WB4510CLP                   | S                | 32.5             | 90               |  |
| Yellowstone                 | S                | 32.5             | 15               |  |
| Balance                     | S                | 35               | 92.5             |  |
| Flathead                    | S                | 35               | 40               |  |
| Scorpio                     | S                | 35               | 92.5             |  |
| WA8309                      | S                | 35               |                  |  |
| Milestone                   | S                | 37.5             | 85               |  |
| Bobtail (susceptible check) | S                | 45.5             | 96.25            |  |
| FourOsix                    | S                | 50               | 80               |  |
| WB4401                      | S                | 50               | 87.5             |  |
| Millie (W)                  | S                | 80               | 100              |  |
| Juniper                     | S                | 82.5             | 15               |  |
| Apst52                      | ---              | ---              | 95               |  |
| HSG108                      | ---              | ---              | 97.5             |  |
| Kairos                      | ---              | ---              | 97.5             |  |
| NuMont                      | ---              | ---              | 25               |  |
| OR2190064R                  | ---              | ---              | 92.5             |  |
| UT11223-10                  | ---              | ---              | 20               |  |
| UT11317-8                   | ---              | ---              | 15               |  |
| Utah 100                    | ---              | ---              | 20               |  |
| WB4303                      | ---              | ---              | 90               |  |
| WB4401                      | ---              | ---              | 85               |  |

**Addendum 1b. Resistance reaction of SWW varieties in a heavily inoculated dwarf bunt (*Tilletia controversa*) nursery, Logan, UT, 2022 and 2023 data. Thanks to our cooperator Dr. Margaret Krause, Utah State University**

| Variety                            | 2022             | 2022             | 2023             | Bunted Head (%) | Disease Reaction            |
|------------------------------------|------------------|------------------|------------------|-----------------|-----------------------------|
|                                    | Disease Reaction | Bunted Heads (%) | Bunted Heads (%) |                 |                             |
| UI Sparrow                         | VR               | 0                | 15               | 0               | VR = very resistant         |
| Otto                               | R                | 0.5              | 30               | 1 to 3          | R = resistant               |
| Stephens                           | R                | 1                | 60               | 4 to 6          | MR = moderately resistant   |
| WA8334                             | R                | 2                | 40               | 7 to 15         | MS = moderately susceptible |
| Devote                             | R                | 3                | 60               | >15             | S = susceptible             |
| IDO1708                            | R                | 3                | 20               |                 |                             |
| ORI2190027CL+                      | R                | 3                | 70               |                 |                             |
| Eltan 11-52-0                      | MR               | 4                | 35               |                 |                             |
| UI Magic CL+                       | MR               | 5                | 85               |                 |                             |
| Eltan                              | MR               | 6.5              | 35               |                 |                             |
| LCS Hulk                           | MR               | 6.5              | 55               |                 |                             |
| SY Assure                          | MR               | 6.5              | 30               |                 |                             |
| Norwest Duet                       | MS               | 7.5              | 40               |                 |                             |
| Nimbus                             | MS               | 7.5              | 40               |                 |                             |
| Sockeye CL+                        | MS               | 7.5              | 45               |                 |                             |
| LCS Blackjack                      | MS               | 10               | 60               |                 |                             |
| TMC M-Press                        | MS               | 10               | ---              |                 |                             |
| VI Voodoo CL+                      | MS               | 10               | 90               |                 |                             |
| WB1529                             | MS               | 10               | 55               |                 |                             |
| WB1621                             | MS               | 10               | 80               |                 |                             |
| AP Iliad                           | MS               | 15               | 97.5             |                 |                             |
| Appleby CL+                        | MS               | 15               | 85               |                 |                             |
| VI Presto CL+                      | S                | 20               | 60               |                 |                             |
| WA8415                             | S                | 20               | 35               |                 |                             |
| VI Shock                           | S                | 25               | 75               |                 |                             |
| Piranha CL+                        | S                | 27.5             | 62.5             |                 |                             |
| WB456                              | S                | 30               | 40               |                 |                             |
| IDO2008                            | S                | 32.5             | ---              |                 |                             |
| AP Exceed                          | S                | 35               | 92.5             |                 |                             |
| WB1376CLP                          | S                | 35               | 97.5             |                 |                             |
| WB1783                             | S                | 37.5             | 85               |                 |                             |
| Brundage                           | S                | 40               | ---              |                 |                             |
| Norwest Tandem                     | S                | 45               | 40               |                 |                             |
| <b>Bobtail (susceptible check)</b> | S                | 45.6             | 91.25            |                 |                             |
| SY Ovation                         | S                | 50               | 75               |                 |                             |
| Stingray CL+                       | S                | 55.5             | 85               |                 |                             |
| TMC M-Pire                         | ---              | ---              | 75               |                 |                             |

Results of 2023 are not characteristic of variety phenotype. Excellent environmental conditions resulted in overwhelming any host resistance.

**Addendum 2: Percent leaf area affected by bacterial leaf streak in winter and spring barley.  
Ratings were taken in Rupert and Aberdeen Extension Variety Trials, 2023.  
LSD = Least Significant Difference (P<0.05).**

| <b>Winter Barley</b> |              | <b>Spring barley</b> |                             |              | <b>Spring barley</b> |                          |              |
|----------------------|--------------|----------------------|-----------------------------|--------------|----------------------|--------------------------|--------------|
| <b>Variety</b>       | <b>BLS %</b> | <b>Entry No.</b>     | <b>2-Rowed Malt Variety</b> | <b>BLS %</b> | <b>Entry No.</b>     | <b>Feed/Food Variety</b> | <b>BLS %</b> |
| 11ARS652-7           | 3.0          | 1                    | AAC Prairie                 | 13.6         | 1                    | Altorado                 | 23.2         |
| 12ARS578-3           | 3.0          | 2                    | ABI Eagle                   | 26.8         | 2                    | Champion                 | 16.0         |
| 12ARS777-1           | 7.0          | 3                    | ABI Raptor                  | 19.2         | 3                    | Claymore                 | 23.2         |
| 12ARS777-2           | 6.5          | 4                    | ABI Voyager                 | 11.6         | 4                    | Diamondback (SB6)        | 55.6         |
| 13ARS537-19          | 7.5          | 5                    | AC Metcalfe                 | 15.6         | 5                    | Goldenhart               | 30.6         |
| Avalon               | 6.5          | 6                    | BC Leandra                  | 9.2          | 6                    | Idagold II               | 32.4         |
| BC Clementine        | 3.0          | 7                    | BC Lexy                     | 9.2          | 7                    | Julie (hulless)          | 30.4         |
| BC Fay               | 3.0          | 8                    | CDC Copeland                | 17.0         | 8                    | Kardia                   | 30.6         |
| Charles              | 3.0          | 9                    | Conrad                      | 11.4         | 9                    | MerlinMax3.3             | 74.3         |
| DH141917             | 4.5          | 10                   | Esmā                        | 11.6         | 10                   | MerlinMax3.6             | 44.4         |
| DH150683             | 1.5          | 11                   | GemCraft                    | 13.6         | 11                   | MerlinMax3.11            | 73.7         |
| DH162310             | 5.0          | 12                   | LCS Diablo                  | 30.2         | 12                   | MerlinMax3.18            | 49.0         |
| DH170472             | 2.5          | 13                   | LCS Genie                   | 24.0         | 13                   | MerlinMax3.19            | 44.8         |
| Eight-Twelve         | 6.0          | 14                   | LCS Odyssey                 | 22.6         | 14                   | LaureateMax3.8           | 33.7         |
| Endeavor             | 7.5          | 16                   | LG8016-1320A                | 19.2         | 15                   | PlanetMax3.3             | 63.0         |
| Flavia               | 6.0          | 17                   | Merit 57                    | 22.6         | 16                   | PlanetMax3.6             | 35.4         |
| Hirondella           | 4.5          | 18                   | Moravian 179                | 16.0         | 17                   | PlanetMax3.13            | 52.3         |
| KWS Donau            | 2.5          | 19                   | Moravian 69                 | 30.8         | 18                   | PlanetMax3.16            | 35.8         |
| LCS Calypso          | 4.0          | 20                   | S14230-41513                | 21.4         | 19                   | Oreana                   | 21.0         |
| Lightning            | 4.0          | 21                   | 16ARS067-13                 | 27.2         | 20                   | Transit (hulless)        | 44.8         |
| Marouetta            | 5.0          | 22                   | 17ARS069-1                  | 18.4         | 21                   | 10ARS191-3               | 28.4         |
| Scoular Test         | 6.5          | 23                   | 17ARS072-5                  | 9.4          | 22                   | 16ARS295-1               | 46.4         |
| Sunstar Pride        | 5.0          | 24                   | 2IM18-4142                  | 14.0         | 23                   | HO516-429                | 25.4         |
| Thunder              | 4.0          | 25                   | 2IM17-2221                  | 9.4          | 24                   | Carleton                 | 19.6         |
| Upspring             | 1.5          |                      |                             |              | 25                   | HO517-126                | 37.8         |
| UTWB10201            | 5.0          |                      | BLS Mean                    | 17.7         |                      | BLS Mean                 | 37           |
| UTWB10406-9          | 5.0          |                      | LSD                         | 12.4         |                      | LSD                      | 14           |
| UTWB11135-1          | 7.5          |                      | CV                          | 56.0         |                      | CV                       | 29           |
| WintMalt             | 4.0          |                      |                             |              |                      |                          |              |
| Average              | 4.6          |                      |                             |              |                      |                          |              |

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