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2024 Small Grains Report

Southcentral and Southeast Idaho Cereals Research and Extension Program

Juliet Marshall, Sidrat Abdullah, Tod Shelman, Linda Jones, Justin Hatch and Sarah Windes

Cover Images

Field near Teton Research and Extension Center. Photo credit: Juliet M. Marshall.

Southcentral and Southeastern Idaho Cereals Research and Extension Program

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Cory and Jamie Kress – Rockland
Dave Scott – Ririe
Clark Hamilton – Ririe
Luke Adams - Rupert
Taylor Grant, Grant 4-D Farms – Rupert
Marc Thiel – Idaho Falls
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Disclaimer Statement This report represents research in progress and results may change with additional testing. Recommendations for use or non-use of any variety tested in these trials is not stated or implied. Inclusion of a variety in these trials cannot be construed as recommending that variety over varieties not included in the trials. ALWAYS read and follow the instructions printed on pesticide labels. The pesticide recommendations in this UI publication do not substitute for instructions on the label. Due to constantly changing pesticide laws and labels, some pesticides may have been cancelled or had certain uses prohibited. Use pesticides with care. Do not use a pesticide unless both the pest and the plant, animal, or other application site are specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock. Trade names are used to simplify information; no endorsement or discrimination is intended.

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2024 Small Grains Report for Southcentral and Southeastern Idaho

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Additions and Changes:

No changes to this year's report – all locations were planted and harvested. For site-specific information regarding conditions, refer to Results and Discussion.

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 2024, milling and baking data from trials

harvested in 2023, as well as disease data from separate screening trials 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 south central and southeast Idaho during the fall of 2023 and the spring of 2024. For location details, please see the descriptions on pages 6 to 12. The Ririe winter, Soda Springs winter & spring, and Rockland winter trials were grown under dryland conditions. All other trials were grown under irrigation. The trials at Aberdeen, Tetonian and Kimberly were grown at UI Research and Extension Centers, and the remaining trials were grown in producers' fields.

Agronomic Practices

Treated 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. 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 planter

with heavy duty double disk openers for no-till planting conditions set at 7-inch row spacing. 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 x yield goal.

Hard winter and hard spring wheat;
lbs/acre nitrogen needed = 2.5 x yield goal,
plus 40 lbs nitrogen/acre topdressed at flowering.

Spring 2 row barley: lbs/acre nitrogen needed = 1.7 x the yield goal.

Hard wheat nurseries received the remaining balance of nitrogen as urea (46-0-0) topdressed 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. Nurseries were harvested with either a Wintersteiger Classic or Zurn 150 small plot combines. (Wintersteiger data were recorded using HarvestMaster 800 Classic GrainGage systems and Mirus software. Zurn 150 utilized HarvestMaster H2 Classic Grainage.)

Evaluation for Diseases

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: The 2024 trial was conducted in a dwarf bunt nursery established by the Utah State University in Logan. The nursery is artificially inoculated with *Tilletia controversa* 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 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), 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 Bruker TANGO NIR grain analyzer. Protein data are found in conjunction with the agronomic data noted above in Tables 4 to 66. 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 2024 harvest in this report. Data are given for these characteristics from the 2023 harvest and are found in tables 69-82.

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 for soft white wheat.
- 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

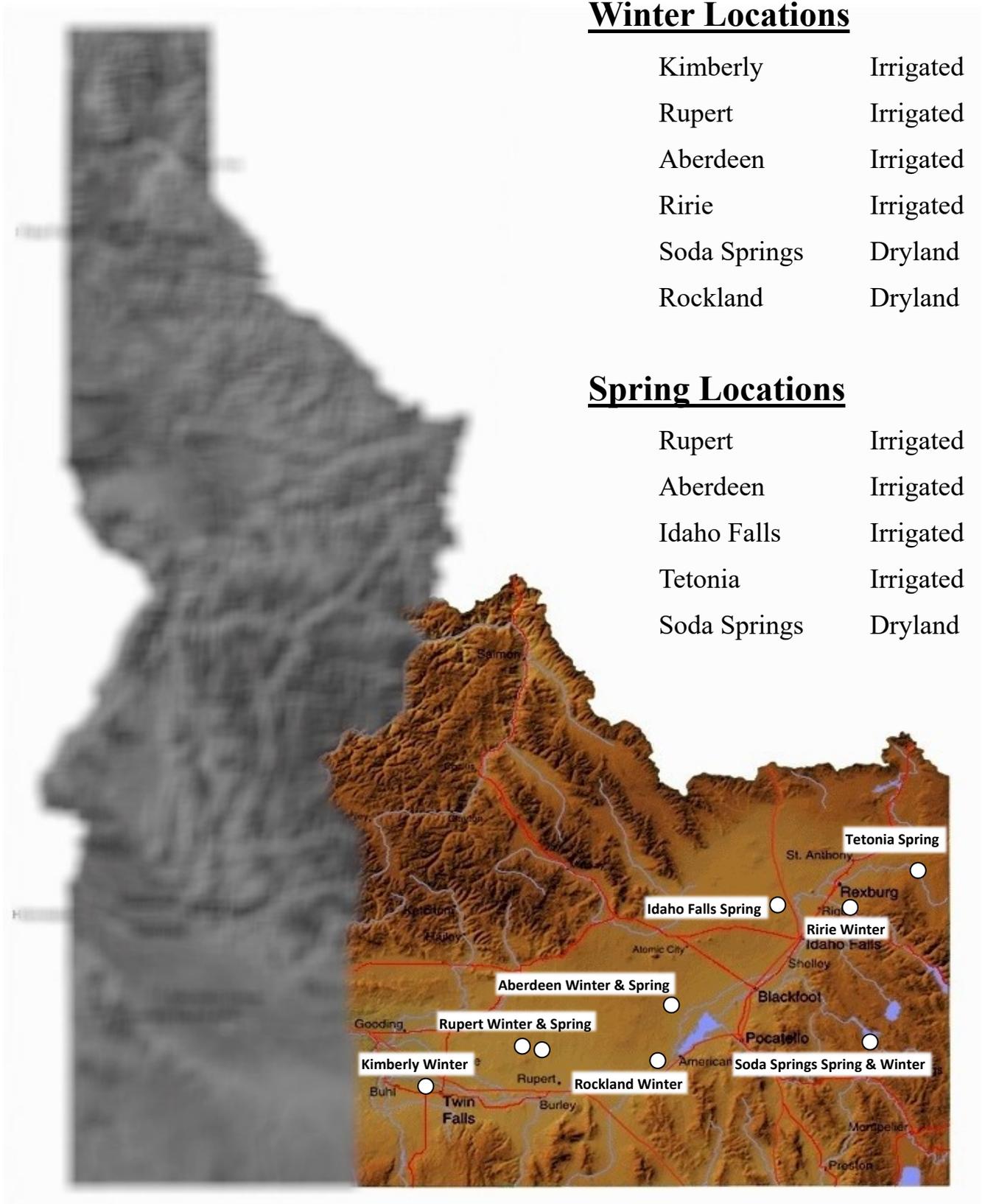
are averages over locations or years where specific statistical analyses were not run on the combined data or are from data obtained from only one replication or are from a composite sample of all replications (e.g. quality data). Most tables from individual locations also contain yield data from two 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 shows the validity of the LSD value above it; if the Pr>F value is equal to or greater than .05 (e.g. 0.1504; 0.6250), then the LSD value is void. This does not mean there are not differences between the varieties, it simply means differences cannot be determined at the 95% confidence level.

Varieties Tested

A list of released varieties tested through 2022-2024 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 2014-2023 in comparison to the current year - 2024.

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: Mustard
Planting Date: October 10, 2023
Harvest Date: August 7, 2024
Chemicals applied: Huskie 15 oz./A, Axial Bold 15 oz./A, Stave 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")	1.2	8.0	12.4	234	234	25 ppm	180 ppm	64 ppm
Fertilizer applied (lbs/A)	-	-	-	340 #	300 #	150#		50# S
Total	1.2	8.0	12.4	574 #	534 #	150 #		50 # S

Rupert Winter Irrigated:

**Cooperator: Luke Adams
Located at junction of Meridian Road and 500 N. Rupert, Idaho**

Coordinates: 42°41'31.36" N 113°39'55.26"W
Elevation: 4182 ft.
Soil Type: #24 Portneuf silt loam, 1-4% slopes
Previous Crop: Spring Barley
Planting Date: October 6, 2023
Harvest Dates: August 1 & 2, 2024
Chemicals applied: Huskie 15 oz./A, Axial Star 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")	1.1	7.8	2.3	196 #	196 #	42 ppm	388 ppm	49 ppm
Fertilizer applied (lbs/A)	-	-	-	172 #	132 #		-	
Total	1.1	7.8	2.3	368 #	328 #		-	-

Location Descriptions

Aberdeen Winter Irrigated:

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

Coordinates: 42°57'22.27"N, 112°49'30.43"W
Elevation: 4404 ft.
Soil Type: Declo loam, 0-2% slopes
Previous Crop: Green Manure Oriental Mustard
Planting Date: October 5, 2023
Harvest Dates: August 9, 12, & 15, 2024
Chemicals applied: Brox-M 1 pint/A, Stave 6 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")	1.2	8.1	7.8	137	137	35 ppm	243 ppm	43 ppm
Fertilizer applied (lbs/A)	-	-	-	350 #	250 #	100 #	-	25 # S
Total	1.2	8.1	7.8	487 #	387 #	100 #	-	25 # S

Ririe Winter Irrigated:

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

Coordinates: 43°36'07.80"N, 111°41'13.66"W
Elevation: 5183 ft.
Soil Type: #42 Ririe Silt Loam, 4-12% slopes
Previous Crop: Potatoes
Planting Date: October 7, 2023
Harvest Date: August 16, 2024
Chemicals applied: Talinor 13.7 oz./ A, MCPA 10 oz, Rezuvant 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	6.0	102 #	102 #	19 ppm	271 ppm	103 ppm
Fertilizer applied (lbs/A)	-	-	-	190 #	150 #	-	-	-
Total	1.6	7.9	6.0	292	252	-	-	-

Location Descriptions

Rockland Winter Dryland:

Cooperators: Cory and Jamie Kress
Rockland, ID

Coordinates: 42°20'27.54"N, 112°49'04.91"W
Elevation: 5359 ft.
Soil Type: #92 Wahtigup Hondoho Complex,
4-30% slopes
Previous Crop: Fallow
Planting Date: September 27, 2023
Harvest Date: August 7, 2024
Chemicals applied: Huskie 13oz/A
Fertility:

	Organic Matter %	pH	Free Lime %	Winter wheat N#/A	P	K	S
Fertilizer applied (lbs/A)	-	-	-	45 #	-	-	10 #

Soda Springs Winter Dryland:

Cooperator: Jake Ozburn
Located ¾ mile north of Soda Springs on Government Dam Road.

Coordinates: 42°40'21.46"N, 111°35'36.04"W
Elevation: 5888 ft.
Soil Type: 700AA Rexburg, Ririe complex, very deep, cool, 1 to 4% slopes
Previous Crop: Fallow
Planting Date: October 13, 2023
Harvest Date: August 29, 2024
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")	1.7	7.5	<1.0	101 #	18 ppm	282 ppm	26 ppm
Fertilizer applied (lbs/A)	-	-	-	-	-	-	-
Total	1.7	7.5	<1.0	-	-	-	-

Ririe Winter Dryland:

Cooperator: Trevor Davey / Dave N

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

Coordinates:

43°32'01.28"N, 111°41'45.90"W

Elevation:

5628 ft.

Soil Type:

#42 Ririe Silt Loam, 4-12% slopes

Previous Crop:

Fallow

Planting Date:

September 29, 2023

Harvest Date:

August 22, 2024

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")	2.1	7.6	<0.1	133 #	133 #	16 ppm	471 ppm	22 ppm
Fertilizer applied (lbs/A)	-	-	-			-	-	-
Total	2.1	7.6	<0.1	133 #	133 #	-	-	-

Location Descriptions

Rupert Spring Irrigated:

Cooperator: Taylor Grant, Grant 4-D Farms
700 N 100 E, Rupert, ID

Coordinates: 42°43'05.29"N, 113°38'38.42"W
Elevation: 4220 ft.
Soil Type: #36 Sluka silt loam, 1-4% slopes
Previous Crop: Potatoes
Planting Date: April 22, 2024
Harvest Dates: August 27, 2024
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")	1.5	7.8	3.4	345	345	42 ppm	388 ppm	49 ppm
Fertilizer applied (lbs/A)	-	-	-	142	102	-	-	24 #
Total	1.5	7.8	3.4	487	447	-	-	24 #

Aberdeen Spring Irrigated:

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

Coordinates: 42°57'51.84"N, 112°49'14.98"W
Elevation: 4403 ft.
Soil Type: DeA Declo loam, 0-2% slopes
Previous Crop: Mustard
Planting Date: April 12, 2024
Harvest Date: August 23 & 26, 2024
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")	1.2	8.2	10.3	74	74	17 ppm	226 ppm	24 ppm
Fertilizer applied (lbs/A)	-	-	-	250	200	100	-	40# SO ₄
Total	1.2	8.2	10.3	324	274	100	-	40#SO ₄

Location Descriptions

Idaho Falls Spring Irrigated:

Cooperator: Marc Thiel

Approximately 20 S. on 45th West Idaho Falls, ID

Coordinates: 43°28'39.23"N, 112°07' 25.80"W
Elevation: 4676 ft.
Soil Type: #22 Pancheri silt loam, 0-2% slopes
Previous Crop: Barley
Planting Date: April 15, 2024
Harvest Date: August 21 & 28, 2024
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
Barley								
12" soil test results (N & S= 0-24")	1.7	7.8	11.6	146	146	30 ppm	175ppm	73ppm
Fertilizer applied (lbs/A)				130	130	30 #		
Total	1.7	7.8	11.6	276	276	30 #		
Wheat								
12" soil test results (N & S= 0-24")	1.7	7.7	5.1	217	217	15 ppm	171 ppm	43 ppm
Fertilizer applied (lbs/A)	-	-	-	200	160	30#		
Total	1.7	7.7	5.1	417	377	30 #	-	-

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 16, 2024
Harvest Date: September 10, 2024
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")	1.5	7.8	1.3	112	112	25 ppm	323 ppm	22 ppm
Fertilizer applied (lbs/A)	-	-	-	125	85	10		20
Total	1.5	7.8	1.3	237	197	10		20

Location Descriptions

Soda Springs Spring Dryland:

Cooperators: Kyle Wangemann and Scott Brown
 Location 8 miles north of Soda Springs on Hwy 34 and China Hat Road.

Coordinates: 42°47'10.04"N 111°35'29.39"W
Elevation: 6278 ft.
Soil Type: 705 AA Lostine - Foundem complex, 1 to 4 % slopes
Previous Crop: Fallow
Planting Date: May 15, 2024
Harvest Date: September 9, 2024
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)	5# Zn	-	-	50	50	40#	-	12#
Total		-	-	50	50	40#	-	12#

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 30 - August 7, 2024	110	33	37	20	6	5.11
Ririe Irrig.	May 17 - August 16, 2024	104	27	20	60	20	12.55
Ririe Dryland	May 17 - August 22, 2024	101	23	30	57	22	1.54
Tetonia	May 16 – Sept. 10,2024	93	24	10	82	37	11.92
Soda Springs Winter	June 12 – August 29, 2024	99	23	24	63	22	2.42
Rupert Spring	July 16 - August 26, 2024	110	37	32	18	1	2.9
Idaho Falls	June 13 - August 28, 2024	102	29	24	53	13	10.16
Aberdeen Winter	May 22 - July 12, 2024	96	28	8	42	15	14.86

Table 1. Released varieties tested in 2023-2024 with seed size and adjusted seeding rate.

Variety	Exp. No.	1000 Kernel Weight (g)	Seeds per Pound	Adjusted Seeding Rate ¹ (lb/A)	Year Released	Developer(s)/Distributor of variety
Soft White Winter Wheat						
AP Exceed	11PN039#20	48	9,450	106	2020	AgriPro / Syngenta Cereals
AP Olympia	PN17MM604207	34	13,341	75	2023	AgriPro / Syngenta Cereals
Appleby CL+	ORI2161250CL+	34	13341	75	2019	Oregon State AES
Devote	WA8271	32	14,175	71	2019	Washington AES, USDA
Eltan	WA7431	27	16,800	60	1990	Washington AES, USDA
LCS Blackjack	LWW15-71945	46	9,861	101	2019	Limagrain Cereal Seeds, LLC
LCS Drive	LWW12-7105	46	9,861	101	2015	Limagrain Cereal Seeds, LLC
LCS Hulk	LWW14-73163	44	10,309	97	2017	Limagrain Cereal Seeds, LLC
LCS Jefe	LWW17-8185	38	11,937	84	2021	Limagrain Cereal Seeds, LLC
LCS Shine	LCS72916	36	12,600	79	2018	Limagrain Cereal Seeds, LLC
Nimbus	OR2130755	48	9,450	106	2022	Oregon State AES
Norwest Tandem	LOR-334	46	9,861	101	2016	OSU / Limagrain Cereal Seeds, LLC
Otto	WA008092	34	13,341	75	2011	Washington AES, USDA
Perrine	WA8415	33	13,745	73	2024	Nutrien Ag
Piranha CL+	WA8305	37	12,427	80	2020	Washington AES, USDA
Rollie	WA8334	30	15,120	66	2022	Washington AES, USDA
Sockeye CL+	WA8306	34	13,341	75	2020	Washington AES, USDA
Stephens	OR65-116	43	10673	94	1977	Oregon AES
SY Assure	04PN096-2	36	12,600	79	2016	AgriPro / Syngenta Cereals
SY Ovation	03PN108#21	49	9,257	108	2011	AgriPro / Syngenta Cereals
UI Magic CL+	IDN 09-DH11	44	10,309	97	2015	Idaho AES / Limagrain Cereal Seeds
UI Sparrow	IDO1108DH	36	12,600	79	2016	Idaho AES
VI Presto CL+	UIL17-6451CL+	42	10800	93	2020	Idaho AES / Limagrain Cereal Seeds, LLC
VI Shock	UIL15-72223	36	12,600	79	2020	Idaho AES / Limagrain Cereal Seeds, LLC
WB 456	BU6W99-456	41	11,063	90	2009	Bayer Crop Science / WestBred
WB1529	BZ6W07-436	46	9,861	101	2013	Bayer Crop Science / WestBred
WB1545	---	43	10,549	95	2024	Bayer Crop Science / WestBred
WB1621	---	40	11,340	88	2022	Bayer Crop Science / WestBred
WB1783	BZ6W09-471	36	12600	79	2016	Bayer Crop Science / WestBred
Hard Red and White (W) Winter Wheat						
Balance	WA8248	37	12259	82	2020	Nutrien Ag
Artek	Apst-52	40	11340	88	2024	Nutrien Ag
Curlew	UT9325-55	22	20618	49	2009	Utah AES, USDA
Flathead	MT1564	45	10,080	99	2019	Montana AES
FourOSix	MT1462	42	10800	93	2018	Montana AES
Golden Spike (W)	UT1944-158	23	19,722	51	1999	Utah AES, USDA
Greenville	UT9743-42	38	11,937	84	2011	Utah AES, USDA
Irv (W)	OR2110679	44	10309	97	2018	Oregon AES
Juniper	IDO 575	28	16,200	62	2005	Idaho AES, USDA
Kairos	T44	42	10,800	93	2021	Highland Specialty Grain
Keldin	ACS55017	48	9450	106	2011	Bayer Crop Science / WestBred
LCS Blackbird	LWH18-0122	40	11,340	88	2022	Limagrain Cereal Seeds, LLC
LCS Jet	NSA 7208	44	10,309	97	2015	Limagrain Cereal Seeds, LLC
LCS Missile	LWH19-0192	40	11340	88	2022	Limagrain Cereal Seeds, LLC
Milestone	ACS14132-412	33	13,745	73	2020	Nutrien Ag
Millie (W)	OR2130118H	46	9861	101	2021	Oregon State AES
NuMont	MT1491	36	12,600	79	2023	Montana AES
Promontory	UT1567-51	29	15,641	64	1990	Utah AES, USDA
Scorpio	WA8268	46	9861	101	2019	Washington AES, USDA
Sequoia	WA8180	50	9,072	110	2015	Washington AES, USDA
UI Silver (W)	IDO658B	30	15120	66	2011	Idaho AES, USDA
UI SRG	IDO656	44	10,309	97	2012	Idaho AES, USDA
Utah 100	UT000150	33	13,745	73	1996	Utah AES, USDA
WB4303	---	38	11937	84	---	Bayer Crop Science / WestBred
WB4401	XC4109	38	11,937	84	2019	Bayer Crop Science / WestBred
WB4422	---	38	11,937	84	2022	Bayer Crop Science / WestBred
WB4445CLP	---	46	9861	101	2024	Bayer Crop Science / WestBred
WB4510CLP	XD4201	40	11,340	88	2017	Bayer Crop Science / WestBred
WB4640	---	43	10,549	95	2024	Bayer Crop Science / WestBred
WB4733CLP	---	38	11,937	84	2023	Bayer Crop Science / WestBred
WB4739AX	---	42	10800	93	2023	Bayer Crop Science / WestBred
Yellowstone	MT00159	44	10,309	97	2005	Montana AES

¹Adjusted 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 2023-2024 with seed size and adjusted seeding rate.

Variety	Exp. No.	1000 Kernel Weight (g)	Seeds per Pound	Adjusted Seeding Rate ¹ (lb/A)	Year Released	Developer(s)/Distributor of variety
Soft White Spring Wheat						
Alturas	IDO526	38	11,937	84	2002	Idaho AES, USDA
Butch CL+	WA8354CL+	42	10,800	93	2023	Washington AES, USDA
Louise	WA7921	41	11,063	90	2004	Washington AES, USDA
Melba (club wheat)	WA8193	39	11,631	86	2016	Washington AES, USDA
Roger (club wheat)	WA8235	36	12,600	79	2022	Washington AES, USDA
Ryan	WA8214	41	11,063	90	2016	Washington AES, USDA
Seahawk	WA8162	36	12,600	79	2015	Washington AES, USDA
Tekoa	WA8189	39	11,631	86	2016	Washington AES, USDA
UI Cookie	IDO1405S	41	11,063	90	2019	Idaho AES, USDA
UI Stone	IDO599	36	12,600	79	2012	Idaho AES / Limagrain Cereal Seeds
UI Warrior	IDO1902S	38	11,937	84	2024	Idaho AES, USDA
WB6211CLP	XD6305	37	12,259	82	2020	Bayer Crop Science / WestBred
WB6430	BZ608-125	42	10,800	93	2013	Bayer Crop Science / WestBred
Hard Red Spring Wheat						
Alum	WA8166	45	10,080	99	2015	Washington AES, USDA
Alzada (durum)	YU894-75	1	453,600	2	2003	Bayer Crop Science / WestBred
Choteau	MT9920	43	10,549	95	2003	Montana AES
CP3055	---	35	12,960	77	2020	Land O'Lakes
CP3119A	---	43	10,549	95	2021	Land O'Lakes
CP3201AX	---	34	13,341	75	2022	Land O'Lakes
CP3322	---	31	14,632	68	2023	Land O'Lakes
Dagmar	MT1621	36	12,600	79	2019	Montana AES
Espresso	DA984-034SRR	32	14,175	71	2006	Bayer Crop Science / WestBred
Glee	WA8074	43	10,549	95	2012	Washington AES, USDA
Hale	WA8315	43	10,549	95	2022	Washington AES, USDA
Holmes	BZ917-221	36	12,600	79	2023	Nutrien Ag Solutions
Jefferson HF	IDO462	29	15,641	64	2020	Idaho AES, USDA
LCS Ascent	LARR19-0046	32	14,175	71	2020	Limagrain Cereal Seeds, LLC
LCS Boom	LARR19-0024	32	14,175	71	2022	Limagrain Cereal Seeds, LLC
LCS Buster	LNR16-2076	37	12,259	82	2020	Limagrain Cereal Seeds, LLC
LCS Hammer AX	LARA18-90008	34	13,341	75	2022	Limagrain Cereal Seeds, LLC
MT Carlson	MT1939	33	13,745	73	2023	Montana AES
MT Dutton	MT1809	1	453,600	2	2023	Montana AES
MT Ubet	MT2030	38	11,937	84	2024	Montana AES
Rocker	BZ917-277	35	12,960	77	2022	Nutrien Ag
WB8148 (durum)	MTD18148	1	453,600	2	2024	MSU, MAES and Bayer Crop Science / WestBred
WB9668	BZ908-552	29	15,641	64	2013	Bayer Crop Science / WestBred
WB9707	XC9304	53	8,558	117	2019	Bayer Crop Science / WestBred
WB9724CLP	---	43	10549	95	---	Bayer Crop Science / WestBred
WB9749	---	36	12,600	79	2024	Bayer Crop Science / WestBred
WB9879CLP	IMICHT79	37	12259	82	2011	Bayer Crop Science / WestBred
WB9929	---	54	8,400	119	2024	Circle S Seeds
Hard White Spring Wheat						
Alzada (durum)	YU894-75	54	8,400	119	2003	Bayer Crop Science / WestBred
Dayn	WA8123	38	11,937	84	2012	Washington AES / AgriPro/Syngenta Cereals
SY Teton	SY10136	44	10,309	97	2015	AgriPro / Syngenta Cereals
UI Gold	IDO1804S	34	13,341	75	2022	Idaho AES
UI Platinum	IDO694C	38	11,937	84	2014	Idaho AES, Anderson Group
WB7202CLP	XA7320	43	10,549	95	2017	Bayer Crop Science / WestBred
WB7313	---	46	9,861	101	2020	Bayer Crop Science / WestBred
WB7589	BZ9S09-0735W	40	11,340	88	2014	Bayer Crop Science / WestBred
WB7696	XB9512	39	11,631	86	2018	Bayer Crop Science / WestBred
WB7747	---	41	11,063	90	2024	Bayer Crop Science / WestBred

¹Adjusted 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 2024 with seed size and adjusted seeding rate.

Usage	Variety	Exp. No.	1000 Kernel Weight (g)	Seeds per Pound	Adjusted Seeding Rate ¹ (lb/A)	Year Released	Developer(s)/Distributor of variety
Two-Rowed Spring Barley							
Feed	Altorado	BZ509-601	44	10,309	78	2016	Highland Specialty Grains
Feed	Carleton	HO517-245	49	9,257	86	2023	Highland Specialty Grains
Feed	Champion	YU501-385	67	6,770	118	2007	Highland Specialty Grains
Feed	Claymore	BZ509-216	53	8,558	93	2015	Highland Specialty Grains
Feed	LG Capitol	---	61	7,436	108	---	Limagrain Cereal Seeds, LLC
Feed	LG Caravelle	---	56	8,100	99	---	Limagrain Cereal Seeds, LLC
Feed	Rulon	UTSB10905-72	49	9,257	86	2023	Utah AES
Feed	Successor	DH190481	54	8,400	95	2023	Oregon State University
Food	Goldenhart ²	2Ab09-X06F058HL-31	42	10,800	74	2018	Idaho AES, USDA
Food	Kardia	2Ab09-X06F084-51	48	9,450	85	2016	Idaho AES, USDA
Food	Transit ²	03AH3054-51	47	9,651	83	2010	Idaho AES, USDA
Malt	AAC Connect	TR04282	46	9,861	81	2016	Agriculture Canada / Canterra Seeds
Malt	AAC Prairie	TR17255	43	10,549	76	2022	Canterra Seeds
Malt	ABI Eagle	2B11-4949	41	11,063	72	2018	Busch Agricultural Resources, LLC, Ft. Collins, CO
Malt	ABI Raptor	2IM14-8212	46	9,861	81	2022	Busch Agricultural Resources, LLC, Ft. Collins, CO
Malt	ABI Voyager	2B03-B3719, TR09402	49	9,257	86	2011	Busch Agricultural Resources, LLC, Ft. Collins, CO
Malt	BC Ellinor	---	47	9,651	83	---	Breuncraft
Malt	BC Leandra	---	39	11,631	69	---	Limagrain Cereal Seeds, LLC
Malt	CDC Copeland	TR150	46	9,861	81	1999	CDC University of Saskatchewan/ SeCan
Malt	CDC Fraser	TR12135	47	9,651	83	2018	CDC University of Saskatchewan/ SeCan
Malt	Esmā	---	44	10,309	78	---	Ackermann Saatzeit GmbH & Co. KG
Malt	GemCraft	2Ab08-X05M010-65	39	11,631	69	2018	USDA ARS, Idaho AES
Malt	LCS Diablo	LG Diablo	48	9,450	85	2021	Limagrain Cereal Seeds, LLC
Malt	LCS Genie	---	42	10,800	74	2011	Limagrain Cereal Seeds, LLC
Malt	LCS Odyssey	NSL08-4556-A	46	9,861	81	2015	Limagrain Cereal Seeds, LLC
Malt	LCS Slovan	---	50	9,072	88	2017	Limagrain Cereal Seeds, LLC
Malt	Moravian 69	C69	50	9,072	88	2005	Molson Coors Beverage Company
Malt	Moravian 179	C10-116-201	47	9,651	83	2019	Molson Coors Beverage Company
Winter Barley							
Malt	Avalon	VA16M-81	51	8,982	89	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	1	453,600	2	2005	Limagrain Cereal Seeds, LLC
Malt	Endeavor	95Ab2299	44	10,309	78	2008	Idaho AES, USDA
Malt	Flavia	---	50	9,072	88	---	Ackermann Saatzeit / Virginia Tech
Malt	GN0- Vivar	DH170472	1	453,600	2	2024	Oregon AES
Malt	Hirondella	---	46	9,861	81	---	Ackermann Saatzeit / Virginia Tech
Malt	KWS Donau	---	52	8,723	92	---	KWS Cereals
Malt	LCS Calypso	---	52	8,723	92	2017	Limagrain Cereal Seeds, LLC
Malt	Marouetta	---	44	10,309	78	---	Ackermann Saatzeit / Virginia Tech
Malt	Thunder	10.0777	45	10,080	79	2016	Oregon AES, USDA
Malt	Top Shelf	DH162310	1	453,600	2	2024	Secobra / Agrii UK / Scoular
Malt	Wintmalt	---	47	9,651	83	2014	KWS Lochow
Feed	Memento	---	45	10,080	79	2017	Scoular
Food	Upspring ²	05ARS748-270	44	10,309	78	2018	Idaho AES, USDA

¹Adjusted to plant 800,000 seeds per acre under irrigation according to the number of seeds per pound for each variety.²Hulless barley

RESULTS AND DISCUSSION

Planting Conditions

September rains provided some moisture for planting of fall seeded crops. Dryland plots emerged well after seeding and were well-established prior to winter. October through January were below average in precipitation, resulting in low subsoil moisture conditions. At Aberdeen, fall precipitation was much lower than average (see Chart 1a), with good moisture in February and March. Higher than average moisture in February and March improved soil moisture substantially. Temperatures throughout the winter were mild, resulting in good winter survival of winter crops.

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 lower-than-average rain resulted in slow emergence and plant growth. Upper elevation spring grain emergence was good but followed by extended drought resulted in poor root development of spring crops.

Weather

Winter conditions were good with little to no winter damage in irrigated fields. The growing degree days were high for the fall, with the fall-planted crop entering the winter with higher than usual GDD accumulation. Drier than average conditions continued from 2021, with annual growing year precipitation recorded as 7.36 inches (Chart 1b) at the Aberdeen R&E Center. Spring temperatures were very low through June when temperatures remained at average

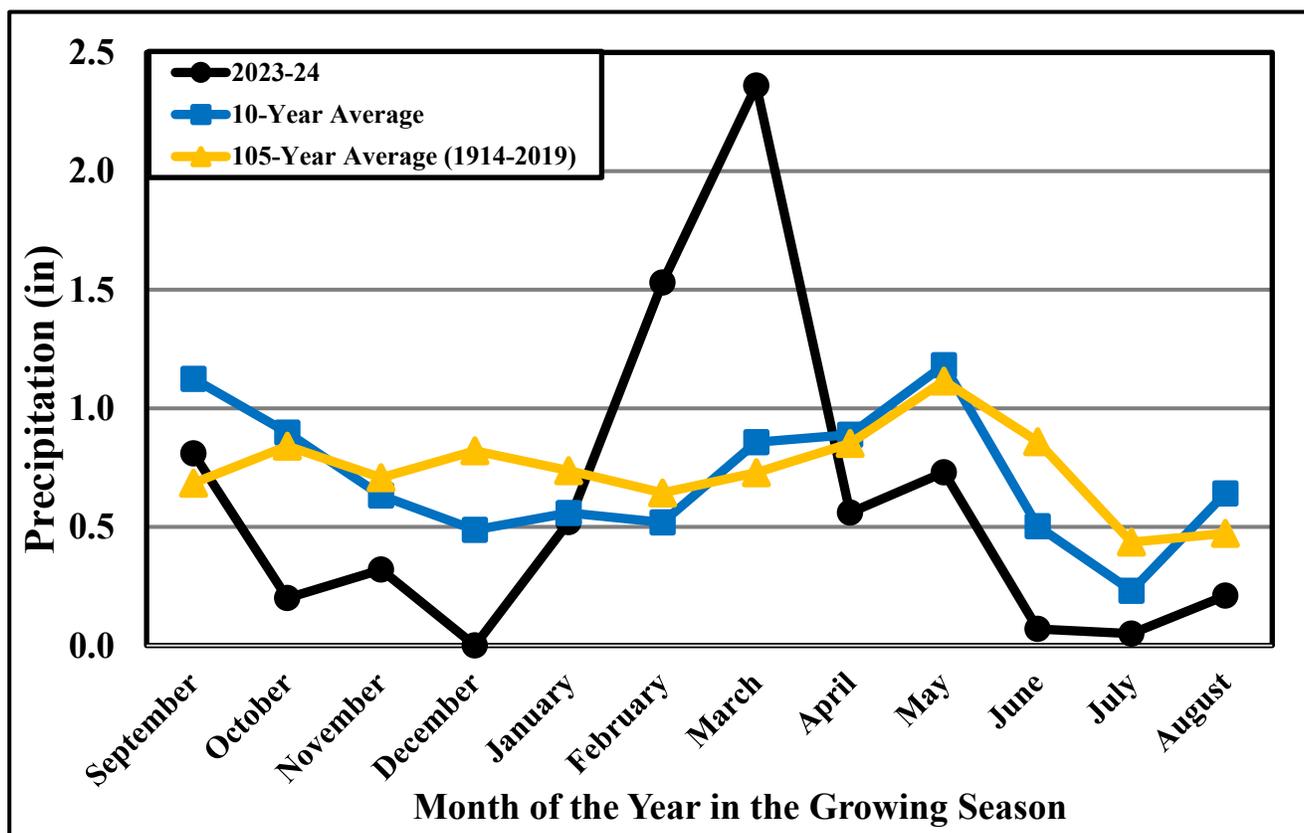


Chart 1a. 2023-2024 growing year precipitation recorded at Aberdeen, ID, versus 10-year and 105-year averages. Source: NWS & Agrimet data.

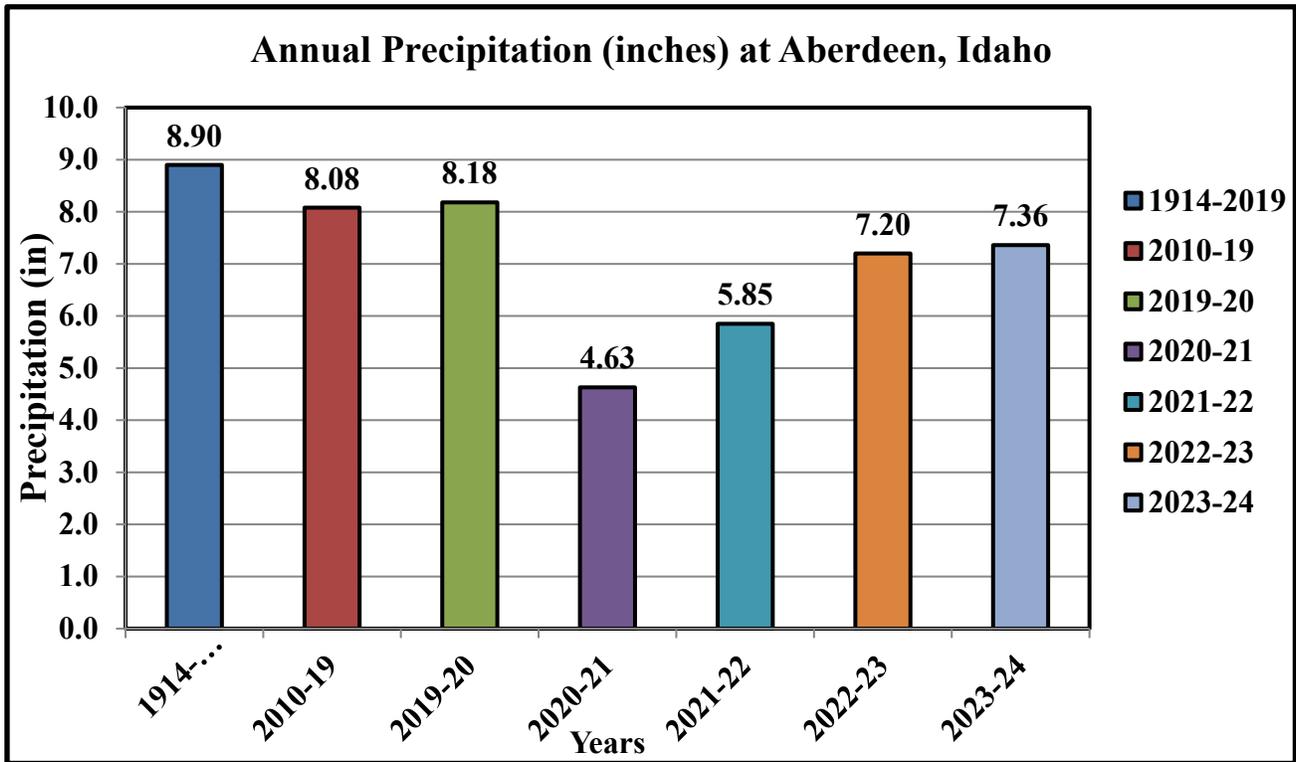


Chart 1b. Growing year precipitation data recorded at Aberdeen, ID for the previous five years, versus 10-years (2010-2019) and 105-year averages. Source: Agrimet data.

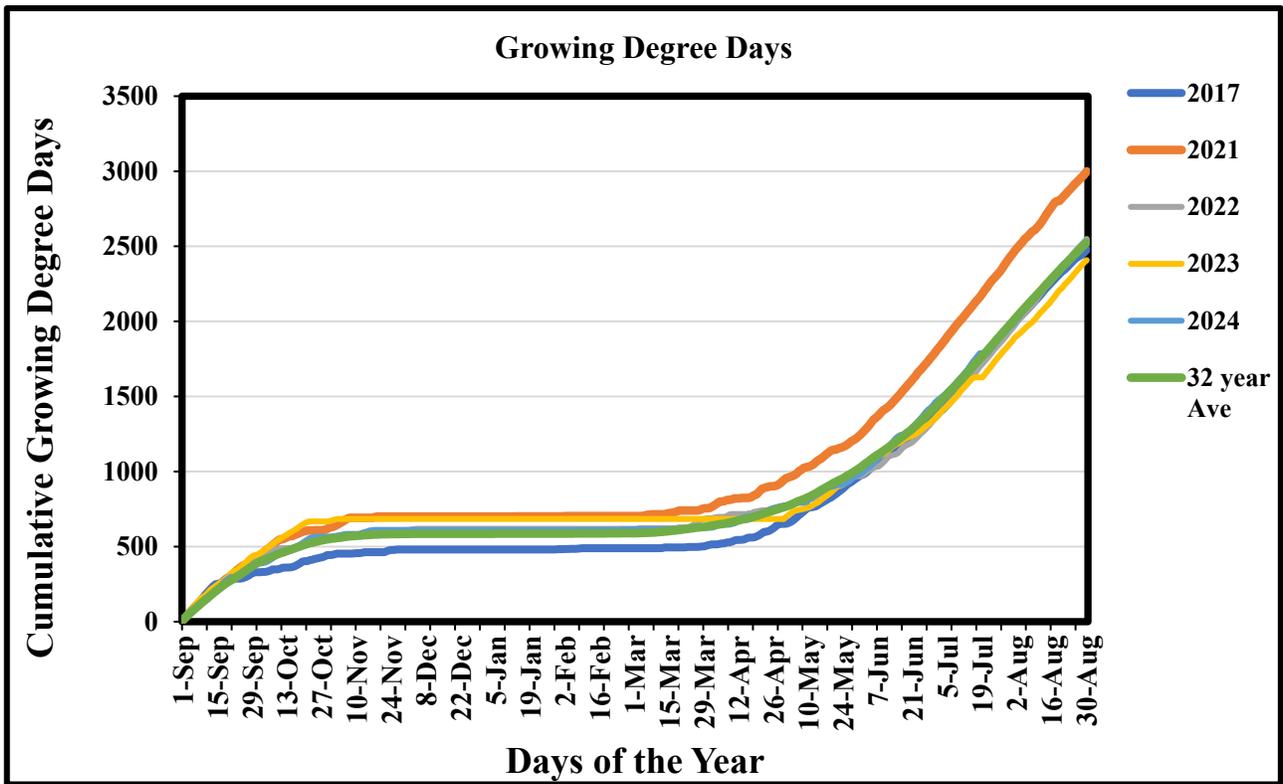


Chart 1c. Growing degree-day data recorded at Aberdeen, ID, in 2024 versus 2015, 2021 and 31-year averages. 2024 GDD closely follows the 32-year average and is difficult to see. Source: Agrimet data.

through the summer. The accumulated growing degree days were similar to previous years (Figure 1c).

Due to the cool spring conditions, heading dates of winter and spring wheat were delayed over the previous 10-year average, with the winter wheat 2 days later and the spring wheat 6 days later than the 10-year average (Table 3). For spring barley, the spring heading date was also delayed 7 days from the previous 10-year average.

Growing conditions were excellent for cool season crops, and yields were expected to be high. Severe frost conditions during June 18-19 resulted in significant yield losses for both winter and spring grains. Some upper elevation winter wheat fields near Arbon Valley were completely wiped out, resulting in no yield.

Natural precipitation was below the 10-year and 107-year averages in almost every month except March. Some areas had late rain season rains which resulted in sprout damage at several locations (Chart 1). The results of falling number tests can be found on our website.

Over all locations (Table 3), yields were lower than the 10-year average for winter wheat, and at the lowest of the 10-year average for spring wheat and barley. Plant heights were 2 inches lower than average for winter wheat, 1 inch greater for spring barley and at average for spring wheat. Lodging was less than average for wheat and for spring barley.

Of the grain that survived frosts, test weights were above average for winter wheat. Test weights were average for spring wheat crops, and very good for spring barley.

Crop quality was considered good 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 reduces FHB and levels of DON (vomitoxin associated with FHB infection), and overall due to the dry conditions, FHB disease levels were minimized.

Disease and Insect Problems

Major insect and disease issues were limited. Very little wireworm damage occurred, and cereal leaf beetles were responsible for low levels of leaf damage during the season. There were low levels of stripe rust reported late in the growing season in southern and eastern Idaho, and bacterial leaf streak (*Xanthomonas*) occurred frequently in eastern Idaho without significant yield loss. Physiological leaf spot (PLS) was not a problem in 2024.

There was not significant snow accumulation and very little winter wheat was damaged by snow mold. Overall, foliar diseases were low as compared to previous years when black chaff and bacterial streak were widespread. Infection with *Xanthomonas* often occurs earlier in the season facilitated by hail or sleet events, then develops rapidly as the temperature increases during the summer and then 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 amount of irrigation per center pivot rotation 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 are everywhere, and hail events

are unpredictable and uncontrollable. Effective measures to reduce the disease are often not 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 the soils quickly became dry and warmed as the season progressed, damage dropped as the wireworms buried deeper into the soil. In general, winter grain could 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 fall dry soils is problematic, and winter kill increases under cold and dry conditions, especially for winter barley. Most insecticides applied as seed treatments reduce but do not control wireworms and the resultant feeding damage. Newer insecticides offer much 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 and may also damage spring barley. There was a second report of Hessian fly in 2021 occurring in volunteer wheat near Parma. Thankfully, Hessian fly has not yet become a problem in our production areas.

Volunteer grain continues to contribute to some green bridge conditions. Usually, early planted winter wheat and barley suffer from barley yellow dwarf (BYD) 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. There was a long dry break between spring harvest in 2023 and planting of 2023-24 winter crop, which significantly reduces the green bridge risk.

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 late in the season and would have benefited from fungicide applications post-heading. 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 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 barley stripe rust contributed to significant infections in 2024. However, the two-rowed malt barley “ABI Voyager” was very susceptible to the isolates found near Rupert, ID. Isolates collected by Dr. Max Fraser (Anheuser-Busch) were provided to Dr. Xianming Chen (USDA-ARS, Pullman, WA) who identified two virulent races.

Reported from Dr. Chen in 2024: Race PSH-97 (virulent on Topper, Abed Binder 12, and Bancroft) was first detected from Ecuador samples and first detected in the US in 2020 from two California samples and one Idaho sample. In 2021, it was detected from only one sample from California. It was not detected in 2022 but detected from one California sample in 2023. “Race PSH-118 (virulent on Topper, Abed Binder 12,

Trumpf, and Bigo) was first detected in 2021 from 8 samples from Mount Vernon, WA, from two samples from Mount Vernon again in 2022 and 2023.”

Barley scald (*Rhynchosporium secalis*) did not reach damaging levels and foliar disease throughout the region was limited on barley. In most years, low levels of early season scald infection do little to affect the barley crop and can be ignored. 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 future years, 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 will also increase in minimum and no-till situations where the fungus 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 not significantly affected in 2020 through 2024. 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. 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*) occurs frequently in grain following grain. Fusarium infection occurs in deficit moisture conditions early to mid-season under dryland conditions and occurs where irrigation was not increased to compensate for moisture deficits. Due to the dry fall / winter springs conditions, there weren’t many reports of take-all, which often occurs in over-irrigated and thickly seeded fields. Spring grain fields were seeded after high March rains, and Pythium and Rhizoctonia infections were limited. Some fields of barley had Rhizoctonia infections occurring after volunteer plants were killed with herbicide immediately after 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 with soil-borne diseases in grain following grain. Diseases that spread from dying grain can cause a great deal of damage to the developing roots and seedlings of the newly planted crop, reducing tillering, water and nutrient uptake.

Rhizoctonia infections occurred in many production fields where wheat followed

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 definitely an issue in 2019 but less so in 2020 and 2021. Conditions were not optimal for *Pythium* in 2024. 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 show resistance to ethaboxam fungicide.

Overall, growing conditions in 2024 were not conducive to widespread grain infections of **Fusarium head blight (FHB)** (also called Head Scab, causal organisms *Fusarium graminearum* and other *Fusarium* spp.). FHB infections were found in winter barley fields in the Minicassia production regions near Rupert. Hot and dry conditions at flowering were not favorable for infection in spring grains. Low levels of DON occurred in seed grain that was planted in fields following corn. A significant problem in 2015, FHB reduced yields and contaminated grain with toxins over multiple years - in 2011, 2012, 2014 and 2015. In 2015, *Fusarium graminearum* was widespread but **was not** restricted to where wheat follows 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 2024, 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 infections and damage since 2019 has been very low.

Cereal cyst nematode (*Heterodera avenae*) (CCN) damage was extensive in spring wheat and spring barley fields in the northern Snake River Plain, with visible damage in crops from Rexburg, Plano, and St. Anthony through the Ashton area. 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. CCN screening trials have been conducted in a heavily infested field west of Rexburg and in the St. Anthony area. Crop rotation to broadleaf crops will substantially reduce 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 (as occurred in 2010) 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; 4) In most years, volunteer grain blown out of the combine at harvest germinates and provides 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 pathogenic organisms from

year-to-year. In years like 2019, 2020, 2021 and 2024 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, 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 transmitting 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.

2024 Report: Discussion of Location Conditions and Results

Following three years of below-average precipitation, subsoil moisture was very low. March rains were effective in providing additional subsoil moisture and reducing excessive stress that can occur following anthesis. In 2022, dry patchy areas in production fields became evident when maximum evapotranspiration occurred during grain fill. There were no soil moisture reserves when higher temperatures hit in June, July and August. Spring grains were damaged the most, resulting in lower test weights and shriveled grain. In contrast, even with limited subsoil moisture the cool spring in 2024 provided good grain production environment, reducing crop stress and resulting in good test weight. NASS within the USDA reports Idaho 2024 planted wheat acres at 1.21 million acres, of which 1.13 million were harvested. For spring wheat, 435,000 acres were harvested of the 450,000 acres planted with an average yield of 89 bu/A. For winter wheat, 700,000 acres were harvested of the 760,000 acres planted with an average yield of 89 bu/A.

For barley, 510,000 of 530,000 acres planted in 2024 were harvested (NASS) for a total harvest of 55.59 million bushels (compared to 60.48 million bushels in 2023, and 59.9 million bushels in 2022). The majority (75%) of barley acres are produced under irrigation. The average yield in the state was reported as 109 bu/A (compared to 112 bu/A in 2023 and 111 bu/A in 2022). Idaho produced 38.7% of the 2024 US barley crop. See the following websites:
<https://www.idahobarleycommission.org/>

and
https://www.nass.usda.gov/Statistics_by_State/Idaho/index.php

It is best to consider three year or multiple year, multiple site averages when choosing varieties for 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 multiple location/three-year average 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.

Protein Targets

Hard Red Winter Wheat = 12.5% minimum
Hard Red Spring = 14.0% 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.) In Table 4, Keldin was 4 bu/A greater than Keldin +11-52-0 with the starter fertilizer which is not considered statistically significant (LSD = 6 bu/A at Pr < .05). Table 4 included three years of data over multiple irrigated sites. Other agronomic traits were very similar indicating no effect of starter fertilizer. Under dryland conditions (Table 5), Keldin

+ 11-52-0 was equal to Keldin without, with the LSD of 3 bu/A. The impact of starter fertilizer is often greater under dryland conditions where there is usually not a lot of excess nutrients left from the previous crop.

WINTER GRAIN RESULTS

Winter Wheat 3-Year Averaged Data

Three-year averages of hard winter wheat over all irrigated locations (Table 4, 11 site-years) put Keldin, Milestone, LCS Jet, Keldin + 11-20-0, MT1745, Flathead and Yellowstone at the top with 155, 152, 152, 151, 150, 150 and 150 bu/A, respectively. Test weights were a little low, averaging 59.8 lbs/bu. The protein target for hard red winter wheat is 12.5%, and these trials resulted in average protein. Most of the 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 2024 irrigated locations**, the highest yielding **hard winter wheat** varieties (Table 6) were FourOsix (150 bu/A), LCS Jet (150 bu/A), and Yellowstone (146 bu/A) with FourOsix having higher-than-average test weight combined with higher grain protein than the other high yielding varieties. Test weight in 2024 was good due to optimal grain filling conditions and low heat stress. Some locations had sprout damage from late-season rain. Heading dates in 2024 were similar to the 10-year average and were 8 days earlier than 2023. Dryland locations in 2023 headed up to eleven days earlier than 2023. FourOsix, as the highest yielding named hard red winter variety, headed at the average for the irrigated trials, was 1 inch taller and had 12.0% protein and 61.7 lbs/bu test weight.

Average 3-year dryland yields for hard red and white winter (Table 5) were 35 bu/A, where the top yielding varieties included Yellowstone (40 bu/A), FourOsix (39 bu/A), and the advanced line MT1745 (39 bu/A). Protein average for these trials was low at 11.6%, and test weight averages were also low, with 57.8 lbs/bu average. **2024 combined dryland yields for hard red and white winter wheat** (Table 7) averaged 27 bu/A, much lower than 2023 at 35 bu/A, and much less than 2022 at 44 bu/A. The highest yielding varieties in 2024 were Yellowstone (33 bu/A), UI Silver (hard white at 31 bu/A), UT100 (31 bu/A), Sequoia (30 bu/A) and FourOsix (30 bu/a). Proteins were low, averaging only 11.9% grain protein. The dryland trial results were very variable in 2024.

The top yielding **soft white winter varieties over the last three years** over all irrigated locations (Table 16) are AP Exceed (155 bu/A), LCS Hulk (151 bu/A), LCS Blackjack (150 bu/A), SY Ovation (148 bu/A), WB1621 (147 bu/A), VI Gem (147 bu/A), and WB1783 (147 bu/A). All test weights were below 60 lbs/bu, averaging 57.5 lbs/bu due to late season rains inducing pre-harvest sprout. Proteins for the trials were within the soft white winter protein targets between 9–12% grain protein, averaging 10.8%. **Averaged over all 2024 irrigated locations**, the highest yielding **soft white winter wheat** named varieties (Table 18) were LCS Blackjack (155 bu/A), AP Exceed (147 bu/A), UI Sparrow (146 bu/A), and LCS Jefe, LCS Hulk, LCS Shine all at 145 bu/A. Heading date averaged June 2, 9 days earlier than 2023 and 8 days earlier than 2022 (June 10). Plant height was lower than previous years and there was very low lodging. Average test weights were a little low at 59.4 lbs/bu.

Seeding rates of SY Ovation were tested at 0.75, 1, 1.25 and 1.5 and 1.75% of the typically recommended seeding rate of 1 million seeds per acre. The yields between the seeding rates were not significantly different, and were 189, 188, 191, 187, and 192 bu/A, respectively (Table 18). The higher seeding rates hit anthesis a little earlier (1 day). With SY Ovation, increasing seeding rates did not increase yield, and looking at percent of average yield (Table 27), SY Ovation at the standard seeding rate was 106% of average across all locations.

Seeding Rate as a percentage of recommended (1 mill/A)	Yield as Percent of locations
SY Ovation x 0.75	98
SY Ovation x 1.00	106
SY Ovation x 1.25	103
SY Ovation x 1.50	101
SY Ovation x 1.75	102

Average 3-year dryland yields for soft white winter (Ririe, Rockland and Soda Springs) were 35 bu/A, where the top yielding varieties included Sockeye CL+ (41 bu/A), Piranha CL+ (40 bu/A), SY Ovation (38 bu/A), Otto (38 bu/A), and Norwest Tandem (38 bu/A). All had test weight less than 60 lbs/bu and protein between 10 – 12%. **One-year combined dryland locations for 2024** (Table 19) averaged 30 bu/A, 2 bu less than 2023 and 15 bu/A less than 2022. The highest yielding varieties at Eltan (31 bu/A), UI Sparrow (29 bu/A) and Eltan with 11-52-0 in furrow (28 bu/A). Heading date (6/19) was 9 days earlier than in 2023 and similar to 2022. Due to drought, frosts and late-season rain, test weights averaged 57.2 lbs/bu. Grain protein averaged 10.6%.

Winter Barley 3-Year Averaged Data

Three-year, multiple location averages for winter barley are presented in Table 28 (representing 5 site-years). Top yielding released varieties include Clementine (143 bu/A), KWS Donau (130 bu/A), Fay (127 bu/A) and Thunder (124 bu/A). There are malt, feed and food lines in this trial, with Upspring being a hullless food line with very high test weight (comparable to winter wheat) but having reduced spring stands. Proteins were in the target range for malt specs except for the food lines including Upspring, which averaged 13.7% grain protein, and Fay. Plumps of Charles and Endeavor were low and lodging was high compared to the other winter malt varieties. For the one-year **irrigated averages in 2024** (Table 29), the top yielding lines and varieties are Charles (121 bu/A), Hirondeella (107 bu/A), Flavia (106 bu/A), KWS Donau (104 bu/A), and BC Clementine (103 bu/A), significantly less than previous years. Irrigated trial averages in 2022 was 170 bu/A with excellent test weight average of 51.1 lbs/bu. Results in 2023 and 2024 were damaged by winter kill and June frosts. Heading dates averaged 5/24, 7 days earlier than in 2022.

Kimberly Research and Extension Center, Irrigated Winter Grain

Winter wheat nurseries were planted following mustard on October 10, 2023 – and were planted into good conditions. Preplant irrigation helped provide conditions for uniform germination. The crop suffered no winter damage and was planted late enough to avoid BYDV infection. Stripe rust was absent. Plots were harvested August 7th. See page 6 for additional details.

The hard winter wheat group (Table 8) yield ranged from 140 to 192 bu/A, with an average of 172 bu/A. The highest yielding

named variety was LCS Blackbird with reasonable grain protein (11.7%). FourOsix yielded 187 bu/A at 11.6% protein and LCS Jet had 185 bu/A with 11.8% protein. Yellowstone, Keldin and LCS Missile were the next highest yielding varieties, yielding 178, 177, and 176 bu/A, respectively. Site average for yield of the hard winter group was 172 bu/A - 14 bu/A greater than 2023 yields and about 3 bu/A greater than 2022 (Table 8). Test weight average was 61.3 lbs/bu, and grain protein average for the location was low at 11.0%. The plots were fertilized for expected yield that was lower than the highest yielding varieties, resulting in low grain protein in the higher yielding lines. Heading dates averaged 11 days earlier than in 2023. Total N available was 574 lbs N/acre. Optimal grain protein for hard red winter wheat should be 12.5% or greater. The ratio of applied N to (172 average) bu/A yield was 3.3, within the 3.0 to 3.5 ratio needed for optimal protein in hard winter wheat.

Soft white winter wheat yields averaged 179 bu/A - 43 bu/A greater than in 2023 and 12 bu/A greater than 2022 (Table 20). Irrigated yield varied from 155 to 200 bu/A with lower CV's for the location than in 2023, and higher than 2022. LCS Blackjack (200 bu/A), LCS Jefe (193 bu/A), SY Ovation (192 bu/A) and AP Exceed (191 bu/A) were the highest yielding varieties. Heading dates averaged 11 days earlier than in 2023 (6/6). Test weight averaged 59.7 lbs/bu, and grain protein average for the location was at 9.5%. With a total of 534 lbs available N in the nursery (see site description on page 6) and average yield for soft white winter wheat nursery at 179 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 October 6, 2023 in silt loam soil following spring barley into good soil moisture and seedbed conditions. (See page 6.) Spring stands of the winter wheat nurseries were good, without cold damage. There were no visual symptoms of BYD occurring at this site. Plots were within a winter barley field, which matured prior to the winter wheat resulting in less irrigation than optimal for winter wheat yield. Additional damage resulted from late spring / early summer frosts, occurring June 18th and 19th. Plots were harvested August 1st and 2nd.

Winter barley plots averaged 80 bu/A (Table 30). In 2021 the average yields were 154, and in 2022 the average yield was 151 bu/A. (The 2023 trials were plowed under due to winter kill of the surrounding winter barley field.) Yields ranged from 43 (hulless Upspring) to 103 bu/A (Hirondella). Proteins varied widely and averaged 9.3%. Due to the weather induced damage, the usual relationships between fertilizer and grain protein were not calculated. Heading date for the winter barley (5/23) averaged 7 days earlier than in 2022 (5/30). Average yield for the Rupert hard winter wheat trial (Table 9) was 71 bu/A, 57 bu/A less than 2022 and 85 bushels less than 2021. (The 2023 trials were plowed under due to winter kill of the surrounding winter barley field.) Yield ranged from 33 bu/A to 91 bu/A. The highest yielding (named) varieties were LCS Jet (87 bu/A), FourOsix (84 bu/A), LCS Missile (83 bu/a), and Flathead (82 bu/A). Test weight averaged 59.2 lbs/bu which was a little low. The higher yielding varieties with good test weight and protein included FourOsix, Flathead, Keldin, Greenville and Balance. Grain protein averaged 12.0%. Due to the weather induced damage, the usual

relationships between fertilizer and grain protein were not calculated.

The soft white winter group (Table 21) ranged in yield from 56 to 101 bu/A, averaging 37 bu/A less than 2022, and 75 bu/A less than 2021. (The 2023 trials were plowed under due to winter kill of the surrounding winter barley field.) The highest yielding varieties were VI Shock (97 bu/A), LCS Hulk (96 bu/A), WB1621 (95 bu/A), UI Sparrow (94 bu/A) and LCS Jefe (94 bu/A). Test weights averaged low at 58.1 lbs/bu. The proteins were acceptable with the trial average at 10.2%. Lodging was low, but despite poor yields and conditions, VI Presto CL+ averaged 8% lodging.

Seeding rates of SY Ovation were tested at 0.75, 1, 1.25 and 1.5 and 1.75% of the typically recommended seeding rate of 1 million seeds per acre. The yields between the seeding rates were not significantly different, and were 71, 75, 75, 73, and 67 bu/A, respectively. The higher seeding rates hit anthesis a little earlier (1 day). With SY Ovation, increasing seeding rates did not increase yield.

Aberdeen Research and Extension Center, Irrigated Winter Grain

The winter trials in Aberdeen were planted October 5th in a Declo loam soil into good seedbed conditions and soil moisture, and harvested August 9th, 12th and 15th. The preceding crop was green oriental mustard. Neither BYD nor stripe rust was observed in the winter grain. (See page 7 for additional location information.) Overall soil field conditions were poor and resulted in poor performance of winter barley and winter wheat trials.

Winter barley yields ranged from 149 bu/A with an overall average of 97 bu/A (Table 31), 9 bu/A greater than 2023, which had

damage from winter conditions. Yield in 2022 averaged 189 bu/A, which is more representative of the yield potential in this location. High yielding lines and varieties included Charles (121 bu/A), Hirondeella (107 bu/A), Flavia (106 bu/A), and KWS Donau (104 bu/A). Spring stands were very good, with only one variety showing winter tenderness – the hulless food line Upspring. 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 51.9 lbs/bu, with no lodging, and 11.4% grain protein. The ratio of applied N to average bushel yield was 3.4 lbs N/bu (328 lbs N/97 bu/A). Despite the high ratio, grain protein was not high. With the inclusion of hulless lines with high test weight (Upspring, 12ARS777-1, 12ARS777-2) average protein was higher than that for just the malt varieties. The CVs for this trial and the 2023 winter barley trial (Table 31) were very poor, reflecting a stressed environment.

The hard winter wheat survival (Table 10) averaged 98-100%, and performance of the winter wheat trials at this location were better than at the barley plot location. Overall yields were similar to 2023 and 2022. There was no lodging and stripe rust was not found in the winter wheat and did not impact yield. The highest yielding named varieties were WB4640 (167 bu/A), LCS Jet (163 bu/A) and Millie (161 bu/A). The CV of 9.8% for yield was good. Heading date for this group at Aberdeen (6/1) was 8 days earlier than in 2023. Test weights were good at 61.5 lbs/bu for the overall average. There was no lodging in the trial. Grain protein averaged 11.9%. The ratio of applied N to average bushel yield was good at 3.2 lbs N/bu (487 lbs N/154 bu/A). WB4640 showed a good combination

of high test weight and grain protein (63.5 and 12.2%) as did Millie and Keldin.

As with the hard winter wheat winter survival of the varieties (Table 22) ranged from 98-100%, and performance of the winter wheat trials at this location were better than at the barley trials. The overall yield average in the Aberdeen soft white winter trial (Table 22) was 129 bu/A, 15 bu/A less than 2023 and 33 bu/A less than 2022, ranging from the low of 94 bu/A (OR2180377) to a high of 152 bu/A (UIL17-995133B). The highest yielding named varieties were SY Ovation (151 bu/A), VI Shock (148 bu/A), LCS Blackjack (144 bu/A) and AP Olympia (143 bu/A). Heading date for this group at Aberdeen (6/3) was four days later than last year. The test weights averaged very low at 59.9 lbs/bu and the overall grain protein was 9.7%. The ratio of applied N (387 lbs N) to average bushel yield (129 bu/A) was 3.0 lbs N/bu. Despite the relatively high N, grain protein remained at or below target for soft white winter wheat. There was no lodging.

Seeding rates of SY Ovation were tested at 0.75, 1, 1.25 and 1.5 and 1.75% of the typically recommended seeding rate of 1 million seeds per acre. The yields between the seeding rates were not significantly different due to the large variability in this trial, and were 129, 139, 144, 143, and 151 bu/A, respectively. The higher seeding rates yielded better but with an LSD of 34 bu/A, the results are not significantly different.

Ririe, Clark Hamilton, Irrigated Winter Wheat

Located near Ririe, this irrigated location was added in 2019 on the Hamilton Farm about 600 feet lower in elevation than the dryland plots on the Ririe church farm. (See page 7 for additional location information.) The plots were planted October 7th, into silt

loam soil following potatoes, and harvested August 16, 2024.

Spring stand of the hard winter wheat trial at this high elevation location was excellent for all varieties (Table 23), and the average yield was 166 bu/A, varying from 148 (IDBDH18-17) to 184 bu/A (Milestone). The high yielding named varieties included Milestone, Yellowstone (173 bu/A), WB4640 (172 bu/A) and Scorpio (171 bu/A). Test weight averaged 61.4 lbs/bu. Grain proteins were 12.3%, with 1.6 lbs N per bushel (292 total N available /166 bu average yield), indicating less than optimum levels of N to meet yield and protein of the higher yielding varieties. However, Milestone still had excellent yield, test weight (61.4) and grain protein (12.4%). Average heading date (6/8) was eight days earlier than the previous year.

For the soft white winter wheat trial (Table 23), the yield varied from 148 bu/A to 188 bu/A (WA8405 and LCS Blackjack, respectively). Test weights averaged 60.0 lbs/bu, and grain protein averaged 11.3%. The ratio of lbs N to bushel yield was 1.6 (252 total N available /161 bu average yield), indicating optimum levels of N to meet yield and protein. The high-yielding lines and varieties included LCS Blackjack (188 bu/A), LCS Shine (179 bu/A), AP Exceed (178 bu/A), SY Ovation / WB1529 (173 bu/A) and WB1545 (173 bu/A). Average heading date (6/9) was eight days earlier than the previous year.

Ririe, LDS Church Farm, Dave Scott, 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 29th 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 2024. Plots were harvested August 22, 2024.

The hard winter wheat yield average was 30 bu/A (Table 13), lower than the yield average in 2023 by 8 bu/A. The 2024 yield ranged from 24 to 39 bu/A with a high yield CV at 21.8%. The top yielding varieties were UI Silver (39 bu/A), WB4445 (34 bu/A), Irv (33 bu/A), Keldin (32 bu/A), Millie (32 bu/A) and LCS Missile (32 bu/A). The addition of 20 lbs of P₂O₅ of preplant fertilizer as 11-52-0 in furrow did not show an increased yield over the untreated Keldin, however the trial results were variable and there were no significant differences between the two treatments. Heading date (6/9) trial average was 7 days earlier than 2023 (6/16). Grain proteins were very low at 9.6%. With 133 lbs/N available preplant, there should have been enough nitrogen to meet grain protein needs for hard wheat (4.4 lbs/bu).

The soft white winter nursery yields varied from 18 bu/A (ORI2190025CL+) to 36 bu/A. The soft white winter varieties Piranha CL+, Otto, Rollie, Sockeye CL+, WB 456, and VI Encore CL+ averaged 36, 35, 35, 34, 34, and 34 bu/A respectively (Table 25). The test weights averaged 56.5 lbs/bu, low due to sprout damage. Grain protein averaged 9.2, within the target range for soft white wheat. Heading date (6/11) was six days earlier than in 2023 (6/17).

Rockland, Cory and Jamie Kress, Dryland White Winter Wheat

The hard red and white winter wheat trial at the Kress' was planted following fallow on September 27th and harvested August 7th. Snow mold diseases were not a significant problem, and spring stands were a little

damaged for dryland hard winter wheat (85% in Table 12) and soft winter wheat (96% in Table 24). Dwarf bunt (*Tilletia controversa* Kuhn) was not a problem this year, but all winter varieties were included in dwarf bunt testing in Logan, UT, by Dr. Margaret Krause, previous Utah State University professor and wheat breeder. When using varieties that are susceptible to dwarf bunt, it is highly recommended that an appropriate seed treatment is used to prevent dwarf bunt infection.

The hard winter wheat yield average was 31 bu/A, 13 bu/A less than 2022, which was at a different location (Gilbert and Carl Hoffmeister). The 2023 location at Kress' was not harvested due to snow mold damage. The 2024 hard winter wheat yield ranged from 23 to 39 bu/A with a yield CV at 19.5%, greater than that of 2022, due to high variability at this location. The top yielding named varieties this year were UI Silver (39 bu/A), UI SRG (38 bu/A), Utah 100 (37 bu/A), Curlew (35 bu/A) and Golden Spike (35 bu/A), all public varieties. Trial average heading date (6/13) was two days later than 2022 (6/11). Grain proteins were very good at 13.5%. The hard red varieties with good combinations of yield, test weight and grain protein include UI SRG, Curlew and WB4510CLP.

The soft white winter nursery included at this location reflects the number of growers in the area that are producing soft white winter wheat, although the area is also well-suited for higher protein, hard winter wheat production. Average yield for the soft white winter wheat was 37 bu/A, 6 bu/A greater than the hard winter wheat trial and 6 bu/A less than the SWW trial in 2022, which was at a different location (Gilbert and Carl Hoffmeister). The top yielding named varieties this year were Sockeye CL+ 43 bu/A, Piranha CL+ (41 bu/A), Nimbus (41

bu/A), and VI Encore CL+ (40 bu/A), followed by Eltan, UI Sparrow and Northwest Tandem (all public varieties). The test weight average was a little low at 58.1 lbs/bu. Grain protein averaged 11.7%, a little high for soft white wheat targets. Heading date (6/14) was three days later than 2022 (6/11). Eltan planted with an application of monoammonium phosphate at 20 lbs phosphate per acre 11-52-0 in furrow averaged 5 bu/A less in 2024 and 14 bu/A greater than without the preplant fertilizer in 2022.

Soda Springs, Jake Ozburn, Dryland Winter Wheat

The hard red and white winter wheat trial at the Ozburn's was planted following fallow on October 13th and harvested August 29th. Spring stands were relatively good for this dryland location. Dwarf bunt (*Tilletia controversa* Kuhn) was not a problem this year, but all winter varieties were included in dwarf bunt testing in Logan, UT, by Dr. Margaret Krause, previous Utah State University professor and wheat breeder. When using varieties that are susceptible to dwarf bunt, it is highly recommended that an appropriate seed treatment is used to prevent dwarf bunt infection.

In the hard winter trial, 39 varieties of hard red and hard white wheat were planted, including one check with in-furrow phosphorus fertilizer. The Keldin 11-52-0 included an in-furrow application of monoammonium phosphate at 20 lbs phosphate per acre and yields (24 bu/A) were not statistically different than Keldin without the in-furrow fertilizer (26 bu/A). With a LSD of 11 bu/A, the yield of Keldin with 11-52-0 would have to be 10 bu/A greater to be considered significant.

There was no stripe rust pressure at this location, and the spring stands were

moderate to good, averaging 77%. Varieties with good winter survival include Flathead, WB4445CLP, Yellowstone, and Utah-100. The average heading dates for the hard winter wheat trial was 6/30 for HWW, compared to 7/11 in 2023, 6/25 for 2022, and 6/26 in 2020. The highest yielding varieties of the hard variety trial included Milestone (30 bu/A), FourSix (29 bu/A), Yellowstone (27 bu/A) and Sequoia (27 bu/A). Test weight was low, averaging 58.6 lbs/bu due to pre-harvest sprout and late season rain. There was no lodging. The ratio of available N (101 lbs N/A) to average bushel yield (21) was 4.8 N/bu. As a result, the proteins were high with the trial average of 12.4%. Varieties with good combinations of test weight and protein include Yellowstone, UI SRG and WB4445CLP.

Thirty-three soft white winter wheat varieties were tested in 2023-24 (Table 26). Winter wasn't severe, resulting in an average 94% spring stand, which was better than the hard winter wheat group. Average trial heading dates (7/1) were nine days earlier than in 2023 (7/10), as compared to 2022 (6/25), 2020 (6/28), 2019 (7/3) and 2018 (6/21). A relatively dry summer resulted in yields about 10 bu/A less than in 2020 and 5 bu/A less than in 2023 and 25 bu/A less than in 2022. Yield CV's were high at 31.9%. Average yields for the soft nursery were only 23 bu/A, ranging from 12 bu/A (WB456) to 36 bu/A (VI Vixen). The other higher yielding varieties included Rollie (34 bu/A), VI Encore CL+ (31 bu/A), Norwest Tandem (30 bu/A), SY Ovation (30 bu/A), Devote (29 bu/A), and Otto (29 bu/A). There was no lodging, proteins were at 9.4% average, and test weights low (57 lbs/bu) due to late season rains.

The Eltan 11-52-0 included an in-furrow application of monoammonium phosphate at 20 lbs phosphate per acre. Yields (22 bu/A)

were not statistically different than Eltan without the in-furrow fertilizer (23 bu/A). With an LSD of 10 bu/A, the yield of Eltan with 11-52-0 would have to be 33 bu/A to be considered significantly greater, which is also an indication of the high variability associated with the Soda Springs trials.

The ratio of available and applied N (101 lbs N/A) to average bushel yield (48) was 4.4 N/bu. Surprisingly, the proteins were good to low with the trial average of 10.8%. Only the lowest yielding line (WB 456) was above protein optimum levels for SWW.

If risking planting winter wheat in this 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.

SPRING GRAIN RESULTS

Spring Wheat 3-Year Averaged Data

Over **three years over all locations**, averaging over twelve site-years, the highest yielding hard spring varieties under irrigation (Table 33) were Dayn (hard white spring wheat at 122 bu/A), UI Gold (hard white at 118 bu/A), Homes (117 bu/A), WB9707 (116 bu/A), SY Teton (hard white at 114 bu/A) and Jefferson HF (114 bu/A). The hard reds with the best combinations of test weight and high protein include WB9707 (61.8 lbs/bu and 14% protein), Holmes (61.4 lbs/bu and 13.9% protein), Alum (60.6 lbs/bu and 13.9% protein), Dagmar (60.7 lbs/bu and 14.4% protein) and WB9668 (60.5 lbs/bu and 14.7% protein). The average 3-year test weight was 60.4 lbs/bu, and the average grain protein was

13.4%. The **2024 combined irrigated average** (four locations) for hard spring wheat (Table 35) was 100 bu/A, 19 bu/A less than 2023, and 12 bu/A less than 2022. UI Platinum (W), Alum and WB7313 (W) were the highest yielding lines at 114 bu/A, 109 bu/A and 106 bu/A, respectively. High protein red spring lines were WB9668 (14.8%), Dagmar (14.3%), CP3201AX (14.1%), Espresso (14.1%) and WB9929 (14%) meeting the 14.0% grain protein target.

There is only one **dryland location** for spring wheat (Soda Springs), and the three-year average data is in Table 34. Highest yielding hard spring varieties include Dayn (hard white) at 39 bu/A, Alum at 38 bu/A, SY-Teton (hard white) at 36 bu/A, Glee at 34 bu/A and Dagmar at 33 bu/A. Test weights averaged above 60.7 lbs/bu, but grain protein was at 12.1% indicating higher fertilization is required to bring the hard spring wheat up to preferred levels of grain protein. Choteau showed highest grain protein (12.8%) and had good test weight while Rocker had the highest test weight (61.6 lbs/bu) under dryland conditions.

Three-year averages for soft white spring wheat over all irrigated locations (Table 42) put WB6430 at the highest yield (123 bu/A) of the varieties, followed Alturas (122 bu/A) and UI Stone (121 bu/A). Test weights for all varieties except Tekoa were below 60 lbs/bu. The **2024 combined irrigated average** for soft white spring wheat (Table 44) was 110 bu/A. Alturas yielded 119 bu/A, WA8384 yielded 117 WA8327 yielded 115 bu/A, and Melba 114 bu/A. UI Warrior (IDO1902S) yielded 112 bu/A with excellent test weight. WB6430 yields were also 112 bu/A, but test weight was below the 60 lb target at 59.6 lbs/bu. Test weight was 60.4 lbs/bu for the average, and grain protein 10.2%, which was good

for soft white spring wheat. Average yields were lower than 2023 (125 bu/A) and 2022 (113 bu/A). Test weights were good due to favorable conditions during grain fill.

There is only one **dryland location** for soft white spring wheat (Soda Springs), three-year average data for which is in Table 43. Wb6430 was the highest yielding variety at 41 bu/A, followed by WB6211CLP (40 bu/A), UI Stone (39 bu/A) and UI Cookie at 38 bu/A. Test weight average was 59.8 lbs/bu, and protein was 10.2%.

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 51) puts Esma as the highest yielding variety at 152 bu/A. LCS Odyssey, GemCraft and Moravian 179 were also high producers at 140, 137, and 136 bu/A, respectively), all with excellent test weight and percent plumps. Moravian 179 protein was a little high at 11.6% grain protein.

For the only dryland location for spring malt (Soda Springs), the three-year average data is in Table 52. Gemcraft (49 bu/A) and Esma (47 bu/A) were significantly greater in yield than CDC Copeland, Moravian 69, ABI Voyager and Moravian 179. CDC Copeland, at 43 bu/A, had excellent plumps for dryland conditions, but also had higher grain protein. Test weights were all above 48 lbs/bu. Thins were highest for GemCraft and grain proteins were high for Moravian 179 and ABI Voyager. Average heading date was July 18.

Looking at **combined irrigated averages** for 2024 (Table 53), Esma, Moravian 69, and LCS Odyssey yielded 143, 135, and 134

bu/A respectively, all with excellent test weight, protein and plumps. The heading date for the 2024 trials (6/30) was 1 day later than in 2023 and equal to 2022. Plumps, proteins and test weights were excellent.

For the feed and food varieties, over three years (12 site-years), Altorado and Claymore were the highest yielding named feed varieties (Table 60) at 145 and 142 bu/A, respectively. Kardia (hulled) was the highest yielding food barley, followed by Goldenhart and Transit (both are hullless, as reflected in the very high test weights). In the **combined 2024 irrigated trials** (Table 62), the top yielding named varieties were Carleton (137 bu/A), Claymore (134 bu/A), Altorado (130 bu/A) and Champion (128 bu/A). Successor, while lower in yield, is notable for tolerance to imidazolinone herbicides, often associated with soil residual levels that damage barley in rotation with crops where imidazolinone was applied to control grassy weeds. Heading dates for feed lines were 2 days earlier than in 2023 and 3 days later than in 2022.

Kardia was the highest yielding food barley (127 bu/A) but is hulled with lower test weight in comparison to the other hullless food barleys. The heading dates for the 2024 trials were 2 days earlier than 2023 and 3 days earlier than 2022 trials. Compared to the 10-year averages, over all barley trials 2022, 2023 and 2024 have been significantly later in heading (Table 3).

For the only dryland location for spring feed and food barley (Soda Springs), the three-year average data is in Table 61. Champion, Altorado, and Claymore yields were 50, 49, and 49 bu/A, respectively. Grain protein averaged 11.1%. The hullless food lines tend to perform poorly under dryland conditions. The hulled food line,

Kardia, yielded 38 bu/A and hulless Goldenhart yields were at 27 bu/A.

Rupert, Duane Grant 4-D Farms, Irrigated Spring Grain

The variety trials in Rupert were planted April 22th in silt loam soils (4 days later than in 2021) with good soil moisture and harvested August 27th. The preceding crop was potatoes. There were no major weather-related problems other than a typical dry summer and low subsoil moisture.

There was some lodging for the **hard spring wheat** nursery, averaging at 3% (Table 36) and substantially higher for WB7313, UI Gold and Alum (some lines that may be better adapted to lower irrigation or dryland conditions). Average yield was 84 bu/A, compared to 117 bu/A in 2023, 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 60.1 lbs/bu, and average protein was at 12.8%, below the market target of 14.5%. The top yielding named varieties were Dayn (101 bu/A and 12.7% protein), LCS Hammer AX (95 bu/A and 13.3% protein), WB9707 (95 bu/A and 13.7% protein) and WB9668 (94 bu/A and 14.5% protein). The ratio of available and applied N (487 lbs N/A) to average bushel yield (84) was 5.8 lbs N/bu, very high and related to low overall yields. All hard red and white spring plots were topdressed at flowering with 40 units of N/A. Heading date for this location was 6/22, six days earlier than 2023 (6/16).

The **soft white spring wheat** yield (Table 45) average was 85 bu/A. In 2023, yield averaged 112 bu/A at that location, and 2022 was 102 bu/A. WB6430 yielded 95 bu/A at 9.7% grain protein, Alturas yielded 94 bu/A at 10.6% protein, and UI Warrior yielded 94 bu/A at 9.8% protein. Grain protein average was on target at 10.1%. The ratio of available and applied N (447 lbs N/A) to

average bushel yield (85) was 5.3 lbs N/bu. Surprisingly, the proteins were good to low with the trial average of 10.1% despite the excessive level of N. The yield CV was also good at 9.2%, indicating the variability in this trial was low despite crop stress.

The **spring malt barley** trial at Rupert (Table 54) had average yields of 113 bu/A, about 35 bushels less than 2023 and 18 bu/A less than 2022. Yield ranged from 95 bu/A (ABI Eagle) to 129 bu/A (Esma). The ratio of available and applied N (447 lbs N/A) to average bushel yield (113) was very high at 4.0 lbs N/bu. Lodging averaged 7% overall, and grain protein averaged 10.9%, which very low given the available nitrogen. Esma was the top yielding malt barley (129 bu/A), followed by LG Slovan (127 bu/A), CDC Fraser (122 bu/A), GemCraft (120 bu/A), BC Leandra (118 bu/A) and Moravian 179 (118 bu/A). Test weights averaged 50.7 lbs/bu, and plumps were 95.0%. Heading date for this trial was 6/24, 2 days later than 2023 (6/22). High plumps and test weight reflect good conditions during grain fill.

The average yield for two-rowed feed barley in Rupert for 2024 (Table 63) was 108 bu/A, 52 bu/A less than 2023, and 19 bu/A less than 2022. The high yielding two-rowed feed varieties were Carleton (126 bu/A), Claymore (121 bu/A), and Altorado (115 bu/A). Average test weight for this trial was 51.9 lbs/bu for the feed barleys, and 55.5 lbs/bu for hulless and hulled (Kardia) food barleys. The hulless, high beta-glucan food barleys Transit and Goldenhart yielded 56 and 75 bu/A but also had high test weights (56.3 and 57.7 lbs/bu, respectively). For this trial, the ratio of available and applied N (447 lbs N/A) to average bushel yield (77) was 5.8 lbs N/bu for the food barley with average grain protein of 10.4%, and 4.1 lbs N/A for feed (447/108), with 10.9% grain protein.

Aberdeen Research and Extension Center, Irrigated Spring Grain

Spring variety trials were planted April 12th, 9 days prior to 2023 (April 21st), 6 days later than in 2022 and 9 days later than in 2021.

Trials were planted into Declo loam soils with good soil moisture and were harvested August 23rd and 26th and 31st. The preceding crop was mustard. Stripe rust of wheat came in late season at escalated to damaging levels in susceptible varieties. Overall, disease pressure was very low.

The CV for yield in the Aberdeen hard spring trial was a little high at 11.1% for yield (Table 27). Hard spring wheat yield varied from 82 bu/A (WB7313, which is susceptible to stripe rust) to 128 bu/A (Dayn hard white spring). The top five named varieties for yield were the hard white springs Dayn (128 bu/A), WB7589 (114 bu/A), and SY Teton (113 bu/A). The high yielding hard reds included Jefferson HF 22 bu/A and 13.6% protein), LCS Ascent (121 bu/ and 13.8% protein), WB9929 (120 bu/A and 13.8% protein). Varieties with higher yield, test weight and grain protein are Dayn (61.4 bu/A with 14.1% protein), MT Ubet (61.6 lbs/bu and 14.5% protein), WB7747 (62.6 lbs/bu and 14.9% protein), and WB97907 (60.8 lbs/Bu and 14.6% protein). Test weights for the hard spring wheats averaged 61.1 lbs/bu. There was very little lodging, except for LCS Buster (20% lodging. 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.) The ratio of available and applied N (324 lbs N/A) to average bushel yield (111) was 2.9 lbs N/bu. Yields were 16 bu/A less than 2023, and 6 bu/A less than in 2022, likely due to stripe rust pressure at the end of the season. Heading dates for the hard red spring wheat averaged 6/19, 2 days later than 2023 (6/17), 1 day earlier than in 2022.

The soft white spring wheat yields at Aberdeen (Table 46) averaged 123 bu/A with a range from 100 (Roger) to 136 bu/A (Alturas). The average yield was 17 bu/A less than 2023 and 10 bu/A higher than 2022. Highest yields of lines and named varieties were obtained from Alturas (136 bu/A), Melba (134 bu/A), WB6430 (130 bu/A), and UI Warrior (129 bu/A). The heading date of 6/19 was 12 days later than 2023 (6/7) and was 3 days earlier than 2022 (6/22). There was low lodging averaging 2% and test weights averaged 61.4 lbs/bu. The ratio of available and applied N (274 lbs N/A) to average bushel yield (123 bu) was 2.2 lbs N/bu with an average site grain protein of 11.2%.

Two-rowed malt barley lines yield average was the same as in 2023, and 12 bu/A greater than in 2022 (Table 55). Yield ranged from 95 bu/A (AAC Prairie) to 171 bu/A (LGBU17-1320A). The top yielding lines were LCS Odyssey (159 bu/), BC Leandra (158 bu/A), Esma (157 bu/A), LG Slovan (157 bu/A) and BC Elinor (156 bu/A). The average heading date (6/21) was 1 day later than 2023 (6/22), and 4 days earlier than 2022 (6/25). Lodging averaged 1%. The ratio of available and applied N (274 lbs N/A) to average bushel yield (139 bu/A) was 2.0 lbs N/bu with an average site grain protein of 11.6%. Plumps were high, and average plant height was 37 inches.

The average yield for two-rowed feed barley in Aberdeen for 2024 (Table 64) was 137 25 bu/A less than in 2023, 6 bu/A greater than 2022. The high yielding two-rowed feed varieties were Rulon (141 bu/A), Claymore (139 bu/A), and Carleton (138 bu/A). Average test weight for this trial was 52.8 lbs/bu. The hullless, high beta-glucan food barleys Goldenhart and Transit yielded 101 and 82 bu/A but also had high test weights (60.5 and 57.2 lbs/bu, respectively). Kardia

is hulled with lower test weight than the hullless lines, but with substantially higher yields (135 bu/A). The heading date for this trial was 6/21 for the feed lines, the same as in 2023 and 1 day earlier than 2022 (6/22), and 6/26 for the food lines, the same as in 2023 and 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 (274 lbs N/A) to average bushel yield (137 bu/A) was 2.0 lbs N/bu with an average site grain protein of 12.4% for the feed lines and (274/111) 2.5 lbs N/bu for the food lines with 14.6% grain protein.

Idaho Falls, Marc Thiel, Irrigated Spring Grain

The Idaho Falls wheat plot site followed barley and was in a field of spring wheat and the barley plot site followed barley and was planted in a barley field. Both were planted April 15th (3 days earlier than 2023) in silt loam soils with good soil moisture and harvested August 21st and 28th.

Average grain yield for the hard spring wheat (Table 38) was 114, 11 bu/A less than 2023 and 11 bu/A less than 2022. Hard spring wheat ranged in yield from 99 (WB7747) to 135 bu/A (SY Gunsight).

Average grain protein was at 13.2%, and test weight was at 61.3 lbs/bu. The five highest yielding named varieties were SY Gunsight (135 bu/A and 13.2% protein), MT Carleson (128 bu/A and 13.6% protein), Espresso (125 bu/A and 14.1% protein) and CP3119A (123 bu/A and 12.4% grain protein). Two Montana varieties had some degree of lodging, which overall averaged less than 1%. The only varieties to hit 14.0% grain protein were WB9668 (which also had excellent test weight at 62.2 lbs/A), Dagmar, Espresso, MT Ubet and Holmes. The ratio of available and applied N (417 lbs N/A) to average bushel yield (113) was 3.7 lbs N/bu,

resulting in good to excellent protein levels. Heading date for the trial average (6/26) was four days later than 2023.

UI Warrior, Alturas, Seahawk, Tekoa, UI Cookie, UI Stone, and WB6430 topped the yield chart (Table 47) for the soft white spring wheat varieties at Idaho Falls at 137, 129, 126, 126, 124, 122 and 120 bu/A, respectively, with an overall average of 121, 8 bu/A less than 2023 and 3 bu/A greater than 2022. Yields ranged from 109 bu/A (Roger) to 127 bu/A (UI Warrior). Test weight averages were good at 60.3 lbs/bu, and grain proteins were at 10.1%. The ratio of available and applied N (377 lbs N/A) to average bushel yield (121) was 3.1 lbs N/bu, higher than needed to meet the yield potential for higher yielding varieties but overall the grain protein was good for soft white spring wheat. Heading date for the trial average (6/27) was ten days later than 2023 (6/17).

Two-rowed malt barley yields (Table 56) in Idaho Falls averaged 132 bu/A, 20 bu/A less than in 2023 and 4 bu/A greater than 2022. The yield ranged from 108 (AAC Prairie) to the highest yielding advance line (17ARS072-5) which hit 148 bu/A. Other top yielding named varieties included Gemcraft (147 bu/A), Esma (146 bu/A), BC Elinor (145 bu/A), BC Leandra (145 bu/A), CDC Copeland (141 bu/A), and LCS Odyssey (138 bu/A). Test weight average was very good at 51.6 lbs/bu, protein average was 10.1% and lodging was very low at 1%. The ratio of available and applied N (276 lbs N/A) to average bushel yield (132) was 2.1 lbs N/bu, indicating the amount of available N was adequate to not push protein level too high. Heading dates (6/30) were averaging two days later than in 2023 (6/28).

Two-rowed feed barley trial (Table 65) averaged 132 bu/A, with the top yielding lines averaging 144 bu/A (Claymore), 142 bu/A (Altorado) and 139 bu/A (Carleton). The test weight average for the feed lines was 52 lbs/bu and protein average was 9.7%. 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 57.2 bu/A (with hulled Kardia, average at 51.2 lbs/bu) and overall grain protein was at 14.1%.

Tetonia Research Center, Irrigated Spring Grain

The Tetonia location was planted May 16th, one day prior to 2023 and seven days later than in 2022 in silt loam soil into good soil moisture following summer fallow. Barley plots were harvested September 10th.

The average yield for the hard spring wheat (Table 39) was 91 bu/A, compared to 108 bu/A in 2023, and 113 bu/A in 2022. Heading dates (7/11) were 3 days later than 2023 and were 6 days later than in 2022 (7/5). The range in yield varied from 62 bu/A (CP3201AX) to 127 bu/A (Alzada). Test weights were average at 61.2 lbs/A, and protein averaged 12.7%. The high yielding named varieties were Alzada (127 bu/A), SY CP3322 (114 bu/A), CP3055 (114 bu/a), CP3119A (112 bu/A), and Alum (112 bu/A). The highest proteins were seen in WB9668 (14.8%), CP3201AX (at 13.9 %) and Dagmar (13.8%). The ratio of available and applied N (237 lbs N/A) to average bushel yield (91) was 2.6 lbs N/bu, low for meeting yield and protein targets of hard red spring wheat. The average protein level for hard spring wheat was 12.7%. Proteins are relatively low, and additional N would be helpful to boost grain protein.

In the soft spring wheat trial (Table 48), yield ranged from a low of 89 bu/A

(Seahawk) to a high of 121 bu/A (UI Stone). The high yielding named varieties were the club wheat UI Stone (121 bu/A), Melba (120 bu/A), and Alturas (112 bu/A). Due to high grain moisture at harvest, moisture corrections for many varieties had to be done for yield and resulted in a high degree of variability in the trial. The average yield for the soft white spring trial was 106 bu/A, 10 bu/A less than 2023 (116 bu/A) and 14 bushels less than in 2022 (120 bu/A). Heading dates averaged 7/11, two days earlier than 2023 (7/13), and one day earlier than 2022. The test weight average was good at 60.2 lbs/A, with no lodging occurring. Grain protein averaged 9.2% (197 N available for 106 bu/A average yield). The ratio of 1.9 lbs N/bu resulted in low yields and very low protein levels.

Two-rowed malt barley yield average was 109 bu/A (Table 57), and were 22 bushels lower than 2023, and 35 bushels lower than in 2022. Yield ranged from 76 bu/A (AAC Prairie) to 148 bu/A (Moravian 69). The highest yielding named lines being Moravian 69 (148 bu/A), Esma (133 bu/A), LCS Odyssey (127 bu/A) and Moravian 179 (127 bu/A). Lodging averaged <1%, with a little lodging CDC Fraser. Overall test weight was high at 53.0 lbs/bu, protein averages were very low at 8.8% and plumps were 96%. The N: bu (197/109) ratio calculates as 1.8 lbs N/bu, indicating there was sufficient N for maximum yield and optimal protein. However, due to environmental stresses, the trial performance was unusual compared to other years with high CVs (18.2% for yield).

The feed lines (Table 66) averaged 121 bu/A, 13 bu/A greater than 2023 and 26 bu/A less than in 2022. Carleton (143 bu/A), Claymore (130 bu/A) and Champion (127 bu/A) were the top yielding varieties. The food barleys yield of 97 bu/A were 10 bu/A

more than in 2023 and 15 bu/A less than 2022. The test weights were very high at 54.9 lbs/bu. Kardia (a hulled, high beta-glucan food line) was the highest yielding food line with a test weight of 54.1 lbs/bu. All other lines were hullless, with an average test weight of 58.5 lbs/bu. Proteins of the feed lines averaged 10.4%, with a N:bu ratio of 1.6 lbs N/bu, while the food barley lines averaged 12.0% 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 15th, four days earlier than in 2023 (5/19), and five days earlier than in 2022. The previous year the field was in fallow and plots were planted into good soil moisture. A very dry summer reduced yields. Hail close to harvest damaged this location, with additional precipitation delaying harvest and crop maturity. Barley and wheat plots were harvested September 9th 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 40) were 27 bu/A, 20 bu/A less than in 2023, and 2 bu/a greater than in 2022, and 18 bu/A greater than 2021. The range in yield went from 17 bu/A (Espresso) to 37 bu/A (CP3055). The five highest yielding named varieties were CP3055 (37 bu/A), CP3119A (35 bu/A), the durum Alzada (34 bu/A), Hale (33 bu/A), and Alum (32 bu/A). The average heading date at this location was 7/9, four days earlier than in 2023 (7/13), and 3 days earlier than in 2022. Test weights averaged

61.1 lbs/bu, and proteins were very low, averaging 10.3%. The lines with the best combination of test weight and protein include BZ920-142W (62.8 lbs/bu and 11.8% grain protein) and BZ920-136 (61.1 lbs/bu and 11.5% grain protein).

For the soft white spring wheat (Table 49), the nursery averaged 27 bu/A, 25 bu/A less than in 2023, 4 bu/A less than in 2022, and 4 bu/A greater than 2021. The yield ranged from 22 (UI Cookie) to 32 bu/A (Alturas). Alturas, WB6430, Louise, UI Warrior and Seahawk were the five top yielding varieties at 32, 30, 30, 30 and 29 bu/A, respectively. Test weight average was at 57.6 lbs/bu, and proteins were very low at 8.8%.

For the dryland barley trials, two-rowed malt barley yields (Table 58) ranged from 19 bu/A (AAC Prairie) to 37 bu/A (LGBU17-1320A). The average was 28 bu/A, 27 bu/A less than 2023, 15 bu/A less than in 2022 and 4 bu/A greater than 2021. The highest yielding named lines were LCS Odyssey (33 bu/A), GemCraft (33 bu/A), CDC Copeland (31 bu/A) and Esmā (28 bu/A). There was no lodging, overall test weight was 49.8 lbs/bu and plumps were low at 70%. Protein averages were low at 9.4%.

The feed lines averaged 32 bu/A, 27 bu/A less than 2023, 59 bu/A, 16 bu/A less than 2022, and 12 bu/A greater than in 2021. The highest yielding named varieties included Altorado (41 bu/A), Champion (40 bu/A), and Claymore (35 bu/A) (Table 67). The food barleys yielded an average of 21 bu/A, 22 bushels less than 2023 and 14 bu/A less than in 2022. Kardia is a hulled, high beta-glucan food line, with a test weight of 49.5 lbs/bu and the hullless lines had a test weight of 53.7 lbs/bu. Proteins of the feed lines averaged 9.8%, and of the food lines, proteins averaged 11.5%, very low for malt, feed or food usage.

Table 2. Variety Descriptions

SPRING BARLEY - Malt

AAC Connect (TR04282) – released in 2016 by Agriculture and AgriFood in Manitoba, Canada, AAC Connect is marketed in the U.S. by Meridian Seeds and was in the trials for five years (2018-2022), but not in 2023. AAC Connect has malt quality similar to AC Metcalfe with higher extract and lower beta glucan. It is a mid-maturity, two-rowed variety with moderate resistance to stem rust, spot blotch, spot form of net blotch (SFNB), and FHB. Under Idaho growing conditions, AAC Connect was 2-4 inches taller than average with average lodging, test weight and percent plumps. AAC Connect had a little higher protein in the trials and lower than average yield and lodging. In 2024, average yields were at 84% over all locations (Table 59), was 3 inches taller than average with very high test weight and plumps (Table 53). AAC Connect was moderately resistant to moderately susceptible to FHB.

ABI Eagle (2B11-4949) – released by Busch Agricultural Resources in 2018, Eagle is a two-rowed barley that has been tested in the variety trials since 2017. Yield and test weight were greater than to ABI Voyager with the previous 3-yr average yield 7 bu/a greater than ABI Voyager (Table 51). ABI Eagle should replace Merit 57, having similar levels of test weight, grain protein and heading date, 3-4 inches shorter, with higher plumps. Lodging was a little less than Voyager. Over the previous three years, yield of ABI Eagle was 97% of averages (Table 51), and in 2024, was 88% of location averages (Table 59). FHB reaction has been moderately susceptible. In 2022, ABI Eagle performed well in Rupert (Table 52).

ABI Voyager (B3719) – a 2011 release from Busch Agricultural Resources, Voyager yields were below the average of 3-year irrigated trials (Table 51), below CDC Copeland and ABI Eagle, with average percent lodging, high test weight and plumps. ABI Voyager has a little earlier heading date (2 d), good protein, but is taller (1-4 inches) than average. ABI Voyager is susceptible to cereal cyst nematode (CCN), MR to MS to FHB and shows average levels in ppm of DON.

BC Elinor – an older two-rowed spring malt and feed variety under testing in Idaho for Limagrain Cereal Seeds. BC Elinor was developed in Germany by Breun Craft, targeted for the German all-malt style beers. Elinor averaged 105% of trial average for yield across all locations in 2022 trials but was dropped in 2023 and added in 2024 to three locations, where yields were 106% of average (Table 59). BC Elinor has good test weight, is at average plant height, and maturing a little later than average with excellent proteins and plumps. BC Elinor is susceptible to FHB.

BC Leandra – a two-rowed European malt variety under testing in Idaho for Limagrain Cereal Seeds. Like Elinor, BC Leandra was developed in Germany by Breun Craft, targeted for the German all-malt style beers. BC Leandra averaged 109% of trial average for yield across three locations in 2024 trials (Table 59), yielding similar to Esma and LCS Odyssey in multiple locations (Table 55). Test weights were below and plumps were at average (Tables 54, 55, 56), with 2-4 d later maturity and 4 inches shorter than average. Initial FHB testing showed BC Leandra to be MS to S for FHB.

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 ABI Voyager in irrigated production (Table 51), yielding 95% of irrigated averages, but doing well in dryland production areas. Copeland was 3-6 inches taller than average with greater lodging and was higher than average for grain protein and plumps, with very 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.

Esma – entered into the trials in 2018 by Ackermann Saatzeit GmbH & Co. KG, Esma is the highest yielding two-rowed malt variety over many years, averaging 115% of average for yield in 2024 (Table 59). Over the past three years, Esma has yielded 152 bu/A over all irrigated trials (Table 51). Esma has good test weight, early to medium maturity, is 3-4 inches shorter with low to medium lodging. Esma has performed well under dryland conditions, comparable to GemCraft (Table 52). Esma has good malt quality with high plumps, 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 above trial average, similar to Moravian 179 (Table 51). Test weight was slightly below trial averages. Plant height is 7 inches shorter than CDC Copeland, and heading date was 1 day earlier, with similar plumps. Lodging tends to be greater under irrigated

production systems. GemCraft yielded very well in dryland production (Table 52). GemCraft is MS to S to FHB.

LCS Diablo (LGBU13-1624-A) – LCS Diablo is a non-GN producer (GN0) that was released for dual-purpose malting and distilling with excellent yield potential. (Glycosidic nitrile is a compound present in most American malts which, during distilling, can be converted to ethyl carbamate - a carcinogen.) LCS Diablo is a UK recommended two-rowed malt marketed in the US through LCS (*Parentage: Overture x Sanette*). Heading dates were 3 days later than average and test weights were lower than average. Yield was slightly above average, similar to Moravian 69 and LCS Genie (Table 51). 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 similar to Moravian 69 (Table 51) and at trial average over three years, and 100% of average in 2024 (Table 59). Protein was higher and plumps were similar to Moravian 69. 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 highest yielding varieties, greater than GemCraft, ABI Eagle and Voyager

(Table 51) and in 2024 was 111% of trial averages (Table 59). 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 low 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).

LG Slovan – a spring malting barley from the Czech Republic and tested in 2024 at two locations, Aberdeen and Rupert. LCS Slovan yielded 113% and 112% of location averages (Table 59), similar in yield to Esma with lower test weight (LCS Slovan test weight still high at 51.9 lbs/bu), very high plumps and low grain protein.

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 LCS Genie (Table 51). In 2024, Moravian 69 yields were 108% of location averages (Table 59). 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 (C10-116-201) – 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 GemCraft averaged over 3-yr irrigated locations (Table 44). In the cooler years of 2023 and 2024, Moravian 179 yields were at 95% and 102% (Table 59) of trial averages, respectively. Moravian 179 had very high plumps, good test weight and lower percent lodging than average. Proteins were high, 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 hulless 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 62) put Goldenhart higher in yield than Transit. In 2024, yields were 87% of trial averages (Table 68). Goldenhart has very high test weight and protein (Table 60) as expected for hulless barley. Emergence of the hulless barley varieties generally tends to be poor, especially under dryland production. Goldenhart and the hulless barleys are MS to S to FHB and DON accumulation. PVP was applied for Goldenhart.

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 60) of Kardia was greater than Transit and Goldenhart (both 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 124% of trial averages (Table 68) which included feed lines.

Transit (03AH3054-51) – a two-rowed hulless 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 Goldenhart. As expected for a hulless line, test weights are high for barley. Emergence of the hulless barley varieties generally tends to be poor, especially under dryland production. 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 12 bu/A greater than Champion with comparable high test weight (Table 60). Altorado is similar to Champion in disease resistance, test weight, and lodging with lower in grain protein and plant height (2 inches). Altorado's heading date averaged 1-2 days later than Champion. In 2024, yield was 109% of trial average. (The trial averages include the lower yielding food lines.)

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 slightly

taller than Altorado and tends to have similar standability. Under irrigation in these trials, yields were 3 bu/A and 7 bu/A higher than Claymore and Altorado (Table 62), respectively. Carleton has much better FHB tolerance and less DON accumulation than Oreana and is earlier in heading date.

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 average height, higher than average protein of currently available feed lines, and heads 1-3 days earlier than trial average. Champion is MR to MS to FHB.

Claymore (BZ509-216) – two-rowed 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. Claymore is tall and similar in height to Champion (Table 60), is 1-3 days later in heading, with lower test weight. In 2024, yields were 107% of trial average. Claymore has good FHB tolerance (MR to MS).

Rulon (UTSB10905-72) – Rulon is a six-row spring feed barley with good yields and plump kernels released in 2023 by USU (Dr. Margaret Krause, Dr. David Hole). Rulon yield and test weight were less than Champion in 2024 irrigated trials (Table 62), was 1 inch shorter and 3 days earlier in heading. There is foundation seed available through the Utah Crop Improvement Association (Michael Bouck).

Successor (DH190481) – Successor is a spring 2-row feed barley released by Oregon Agricultural Experiment Station in 2023 that

has imidazolinone-tolerance. Successor is early flowering and is lower yielding under irrigation (Table 62) and dryland conditions (Table 67). It is notable for tolerance to imidazolinone herbicides and can be planted in a rotation with crops that are treated with these chemicals. Successor is well adapted to dryland production in the Pacific Northwest but in 2024 performed poorly in Soda Springs (Table 67). It is comparable in performance to the only other currently available imidazolinone-tolerant cultivar, Survivor, which has not been tested in UI EVTs. Foundation seed is available from Washington State Crop Improvement.

WINTER BARLEY

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, and in 2024 Avalon yields were 81% of location averages (Table 32).

Avalon’s test weight was excellent (51.5 lbs/bu), plumps were good, it headed two days earlier than average, and despite being very tall, had good lodging resistance. 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 in 2022 without significant lodging. Over the past three years, Clementine had excellent yield, plump, and good test weight but higher protein (Table 28). Averaged over both locations, yields were 119% of trial averages

in 2024. 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 or at the winter variety average in most years due to lack of winter hardiness (Table 28) but yielding 109% of trial average in 2024 after a more mild winter (Table 32). Charles is average to 1 inch taller in plant height, 1 day earlier maturing and has a tendency to lodge. Charles 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.

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. Yields can be low, like Charles, compared to newly introduced European varieties and in 2024 was at 100% of trial average (Table 32). 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.

Flavia – developed in Germany by Ackerman Saatzucht and carried through Virginia Tech, Flavia was first tested in 2020-21 trials. Flavia is a short two-rowed winter malt that is early maturing, 2-5 days earlier than Wintmalt and similar to Charles. Yields were comparable to LCS Calypso with higher test weight and lower grain protein (Table 28). Lodging resistance was good and winter survival in 2023 and 2024 was higher than average (Table 28), similar to Thunder and Wintmalt.

GN0-Vivar (DH170472) – OSU developed DH170472, a winter malt variety developed via double-haploid technology which is now named GN0-Vivar. As a zero glycosidic nitrile non-producer (GN0), GN0-Vivar also can also be used in distilling. (Glycosidic nitrile is a compound present in most American malts which, during distilling, can be converted to ethyl carbamate - a carcinogen.) Yields have been similar to or greater than Thunder, with lower test weight, similar winter hardiness and heading dates, but 4 inches taller and high grain protein (Table 28). GN0-Vivar has shown resistance to Bacterial Leaf Streak in Idaho trials. Foundation seed will be available from Washington State Crop Improvement.

Hirondella – like Flavia, Hirondella was developed in Germany by Ackerman Saatzucht and carried through the Virginia Tech program, Hirondella was first tested in

2020-21 trials. Average yields over the past three years were comparable to Charles, with lower test weight. In 2024, yields 119% of trial average and greater than Charles and all other named varieties (Table 29) with lower test weight. Hirondella is earlier than Wintmalt and a little earlier than Endeavor in heading date (Table 28). It has resistance to loose smut, stem rust, net blotch, leaf rust, spot blotch, powdery mildew, BSMV, and BYDV.

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. Average yields over multiple years is below BC Clementine (Table 28). Lodging was below average and winter survival in 2023 and 2024 was very good (Table 28). Heading date / maturity was 1 day later than the average, and proteins were at 10.9%, compared to the trial averages of 12.4%. 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 winter survival in 2023 and 2024.

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 2024, yields were similar to the KWS Donau at 104% of trial averages (Tables 29 and 32). Over three years, LCS Calypso yields were similar to Thunder, but with lower test weight. LCS Calypso has good test weight, is 1-2 inches taller than average with high grain protein and higher

than average lodging. LCS Calypso had good winter survival in 2023 and 2024.

Marouetta – a winter malt barley developed in Germany by Ackerman Saatzeit 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 hulless winter food lines. In 2023, winter survival and yield were below trial averages (Table 25).

Memento – Secobra / Agrii UK. Memento is a European two-rowed winter feed barley (deficiens type) released in 2017 (pedigree Baslic x KWS Cassia) being carried in Idaho through Scoular. In the first year in the trials, yields were at 97% of trial averages (Table 32) and had low test weight. Spring stands were good and heading date was at trial average. Memento was 3 inches shorter than Charles and 6 inches shorter than Endeavor (Table 29). Memento has resistance to barley scald, net blotch and barley yellow mosaic virus.

Top Shelf (DH162310) – released in 2024 through Oregon State University AES, DH162310 is now named Top Shelf. Top Shelf is a winter 2-row malt that is a non-GN variety (glycosidic nitrile non-producer or GN0), an important trait for the distilling industry. Glycosidic nitrile is a compound present in most American malts which, during distilling, can be converted to ethyl carbamate - a carcinogen. Great Western Malting is currently trialing it, and in UI Trials, Top Shelf yielded 183 bu/A in 2022 in Aberdeen (Table 31). Over three years, Top Shelf yields were below average and winter kill reduced stands in 2023 and 2024. Proteins and percent plumps were high (Table 28). Foundation seed available from Washington State Crop Improvement.

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 124 bu/A over the three-year summary (2022-24) with good test weight (50.9 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 28). Heading date is at the trial average and plant height is 1-4 inches less. Plumps and protein were very good although lodging was greater than trial averages, less than Endeavor and Charles. Thunder is susceptible to preharvest sprouting, as are most of the winter and spring malt varieties.

Upspring (05ARS748-270) – Upspring is a hulless, high beta-glucan (7% BG) winter two-rowed food barley variety released from USDA-ARS breeding program in 2018 in conjunction with the University of Idaho AES. Upspring was released as an alternative to Buck. Upspring headed 3-4 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 wheat, at 58.8 lbs/bu averaged over 3 years (2022-24). Grain protein was 13.7%. Seed germination and emergence can be very low, and winter survival was poor in 2020, 2023 and 2024 in both locations (Aberdeen and Rupert). Overall winter survival (measured as spring stand) was 79% in 2021, 95% in 2022, 1% in 2023, and 6% in 2024. Upspring was released under PVP.

UTWB10201 is a six-row winter feed barley that was released by the Utah Agricultural Experiment Station in 2017. UTWB10201 has high yield potential under good

agronomic conditions and high winter survival. The last three trial years have not been optimal for winter barley production. Yields and test weight of UTWB10201 have been below average and it was 4 inches shorter than trial average (Table 29). Foundation seed is available through the Utah Crop Improvement Association.

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 (2022-24), Wintmalt's yield was similar to Charles and less than LCS Calypso and Thunder. Test weight (49.9 lbs/bu) and lodging were below trial average. Wintmalt heading was 2 day later than average, grain protein was high, and plumps were good.

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 even without sprout damage. Alturas is adapted to both irrigated and dry land conditions and yields run above average in all trials (Table 42 and Table 43) similar to WB6430 and UI Stone, 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.

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 third year of testing, yield was less than average (94% of location averages) under irrigated and dryland conditions (Table 50). In 2024 in irrigated and dryland trials, Butch CL+ performed similar UI Cookie for yield with better test weight. Test weight was below trial average and it was 2-3 inches shorter than average.

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 and dryland conditions over the three previous years. Under dryland conditions, yields were higher than WB6430 (Table 43) with good test weight and low protein. 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 42, 43). In 2024 and 2023, Melba did well in the upper elevation locations (Table 50), and yields were 102% of irrigated averages. Melba may lodge under irrigated production. Melba is average in height, 2-5 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 club wheat released in 2022 from Washington State University, Roger has been tested since 2021 (but was not tested in 2022) in the UI EVT, with yields similar to Hedge CL+ and Louise. 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 44) and 2024 yields were 90% of location averages (Table 50), doing well in the upper elevation areas of Tetonia and Soda Springs.

Ryan (WA8214) – Ryan is a partial waxy soft white spring wheat released from Washington AES and USDA in 2016. Over the previous three years, Ryan irrigated yields were slightly below trial average and less than Seahawk (Table 42). Under dry land conditions, yield was similar to WB6430 (Table 43), but with low test weight. 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 WSUs spring wheat breeding program in 2014 adapted to dry land and irrigated production areas. Yield is similar to UI Cookie under irrigation (Table 42) and higher in dryland production (Table 43) with better test weight. Plant height is a little above average and heading 2-4 days later than UI Stone. Seahawk may have a tendency to lodge under high production practices. Seahawk yielded 97% of trial averages in 2024 (Table 50). 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.

Tekoa (WA8189) – a Washington State University 2016 release, Tekoa is a soft white spring wheat released for higher rainfall areas. Yields in 2022-24 were below average (Table 42). In 2024, yields averaged 101% of trial averages (Table 50), doing well in Rupert, Idaho Falls and Soda Springs. Tekoa does not yield as well in seasons where irrigation was restricted at the end of the growing season. Tekoa is adapted to low pH soils where aluminum toxicity can occur. Tekoa has good test weight, is 3-5 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 42) show UI Cookie a little below trial average for yield, yielding less than UI Stone, is lower for test weight and higher for grain protein, and 2 days later in heading compared to UI Stone. Yield performance under dry land conditions is below trial average (Table 43). In 2024, UI Cookie yielded at 96% of trial average (Table 50). 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 42), and less than WB6430. The 3-yr average for yield under dryland trials (Table 43) was less than Alturas. In 2024, UI Stone performed at 100% of average yield (Table 50) and in 2023 performed at 109% of average. 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 similar to WB6430.

UI Warrior (IDO1902S) – a soft white spring wheat developed by the University of Idaho Ag Experiment Station, UI Warrior is exclusively licensed through Ririe Grain Coop. UI Warrior yields are competitive to Alturas and WB6430, in 2024 yielding 106% of trial averages. UI Warrior yields were equal to WB6430 over the previous three years (Table 42), with higher test weight, similar maturity, test weight and 3 inches taller. UI Warrior has stripe rust resistance and good end use qualities. Certified seed should be available in 2026.

WB6211CLP - 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+ which was very susceptible. WB6211CLP yields are below average for the dryland trials, below Ryan and Tekoa (Table 43), yielding at 94% of trial averages in 2024 (Table 50). 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 42), usually with good test weight, and has

moderate 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 42). In 2024, WB6430 yielded at 105% of trial averages (Table 50). WB6430 is susceptible to FHB. FHB reaction for WB6430 is more susceptible than Seahawk (which is moderately susceptible) and has had high levels of DON accumulation in the grain.

SPRING WHEAT – Hard White and Red

Alum (WA8166) – a high protein 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 past three years in the irrigated trials, Alum has had yields less than Jefferson HF, has high test weight, and was much higher in protein (Table 33). 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 / Tetonia area (Table 39) where acidic soils are problematic, also doing well across dry land conditions (Table 34). Alum yields were 110% of location averages in 2024 (Table 41).

Choteau (MT9920) – is a semidwarf hard red spring wheat released by Montana State University in 2003 for dry land production areas. 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 HF under in Soda Springs (Table 34). Choteau is similar in height to Jefferson HF and 2 days later in maturity. Choteau had low to average test weight, high protein and has acceptable end use quality.

Four hard red spring wheats were trialed from Land O'Lakes / Winfield Solutions / **Croplan** in 2024, and presented results represent only one year of testing (see Table 35). As these trials are managed for the average of the plots and the surrounding fields, it is likely the CP varieties did not meet their full yield potential due to the very late maturity of three of the four CP lines. RESISTANCE to stripe rust.

CP3055 – an awned hard red spring wheat released in 2020 through Croplan / Land O'Lakes with “European-style genetics”, yielding below Alum and similar to Jefferson HF with very low test weight. Heading date for CP3055 was 7 days later than trial averages (Table 35) and had low protein levels. CP3055 is responsive to topdress N applications and additional N at anthesis is needed for increased grain protein. However, all hard variety trials had 40 lbs N/acre applied at anthesis in these trials. CP3055 was 4 inches taller than average and did not show lodging in 2024. CP3055 is solid-stemmed, resulting in stem-sawfly resistance and more tolerant of FHB and bacterial leaf streak.

CP3119A – an awnless hard red spring wheat released in 2021 through Croplan / Land O'Lakes also with “European-style genetics”. Heading date for CP3119A was very late, 10 days later than the average. Yield, test weight and grain protein were lower than trial averages, due to the late maturity (Table 35), and was four inches taller than average. CP3119A is a solid stemmed variety with tolerance for wheat stem sawfly, and like all of the CP lines in the trial, should be managed with higher N applications at anthesis. (All hard variety trials had 40 lbs N/acre applied at anthesis).

CP3201AX – a CoAXium® hard red spring wheat released in 2022 via Land O'Lakes / Winfield Solutions, having tolerance to the ACCase inhibitor class of herbicides like Aggressor® providing an alternative to imazamox (Clearfield) herbicide tolerant varieties. CP3201AX headed two days later than the average, and as a result had better test weight than the other three CP lines in the trial. Yields were low and grain protein at 14.1% was above averages (Table 35).

CP3322 – a hard red spring wheat released in 2023 through Land O'Lakes / Winfield Solutions. Heading date for CP3055 was 5 days later than the average. Yields under irrigation were similar to Jefferson HF, with lower test weight, grain protein, and 2 inches taller in plant height (Table 35). CP3322 is a solid-stemmed variety with tolerance to wheat stem sawfly. Like all of the CP lines in the trial, CP3322 should be managed with higher N applications at anthesis. (All hard variety trials had 40 lbs N/acre applied at anthesis).

Dagmar (MTS1588) – the dry land hard red spring wheat Dagmar is a 2019 release from Montana State University. In the 2019 UI trials, Dagmar was the top yielding variety in Soda Springs. Dagmar also has good yield potential under irrigation but will lodge under higher input production (Table 33 and Chart 5) and would benefit from growth regulators. Dagmar has good test weight, high protein, is early to medium maturity and was 2-4 inches taller than the irrigated trial average. Yields were at average in dryland trials (Table 34), and below average under irrigation (Table 33). Dagmar is semi-solid stemmed with resistance to wheat stem sawfly, but it does not have aluminum tolerance.

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 33) over the past nine years of the irrigated trials, yielding 112% of trial averages in 2024 (Table 41). Test weight and heading date were at trial average. Protein (13.1%) was a little below average, but as a hard white, protein targets are above 12.5%. 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.

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 Holmes (Table 33), with lower test weight, similar high protein (14.1%) and 4 days later in 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 lower than average in the irrigated trials (Table 33) and greater than Jefferson under dry land trials (Table 34). Glee has good test weight, is taller than average (4-5 inches taller than WB9668) and is at average for percent seed protein.

Hale (WA8315) – a hard red spring wheat released from Washington State University in 2022, Hale 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 second year in the UI EVT and irrigated yields were at average. Hale had good test weight and grain protein (13.6) was above trial average (Table 35), but below 14.5% HRS target. Hale performed very well under dryland conditions in Soda Springs, yielding 122% of trial yield average in 2023 and 123% in 2024 (Table 40 and Table 41) and having very good test weight. Hale is not tolerant to high acid soils where aluminum can reach toxic levels. Hale is medium-tall in height, has good stripe rust and Hessian Fly tolerance, good end-use quality and good falling number ratings.

Holmes (BZ917-221) – is a red-chaffed, hard red spring wheat developed by Nutrien Ag Solutions for the PNW, and released in 2023. Holmes is a one-gene semi-dwarf with medium maturity. Over the previous three years (Table 33), yields were below average and similar to Espresso and UI Platinum. Holmes has very high test weight and grain protein averaging at 13.9% (Table 33). Heading date has been 1-2 days earlier than WB9668 and is 1-3 inches taller. Holmes contains Yr36 and is MR to susceptible current races of stripe rust, exhibiting susceptibility to the current 2024 race. In 2024 under dryland condition, Holmes yields were similar to Jefferson HF with very good test weight and higher grain protein.

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 33, 34). Jefferson has high test weight and good quality when

there is adequate soil nitrogen and sulfur, and when it has a minimum of 13% grain protein. In 2024, Jefferson HF yields were 101% of average (Table 41), with good yield under irrigation but with lower protein (13.0%). 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 Ascent (LARR19-0046) – a hard red spring wheat released by LCSs in 2020 for the Mountain West production area. In the first year of testing, LCS Ascent was tested only in the irrigated Aberdeen trial, with yields similar to Jefferson and WB9929 at 109% of trial average (Table 41). LCS Ascent had excellent test weight and below average protein (at 13.8% with trial average at 14.3%). Heading date was at trial average. LCS Ascent was 2 inches taller than Jefferson HF, is intermediate in stripe rust susceptibility and has good milling and baking properties.

LCS Boom (LARR19-0024) – a hard red spring wheat released by Limagrain Cereal Seeds in 2022 for the MonDak production region having good disease resistance. In the first year of testing, LCS Boom was only in the irrigated Aberdeen trial, with yields similar to LCS Hammer AX and WB7696, with excellent test weight and high average protein (Table 41). Heading date was similar to WB9668, and while 5 inches taller than WB9668, in this one trial location there was no lodging. LCS Boom has FHB tolerance and resistance to stripe rust.

LCS Buster (LNR16-2076) – a hard red spring wheat released by Limagrain Cereal Seeds in 2020 for the Dakota production region. In the first year of testing, LCS Buster was only in the irrigated Aberdeen

trial, with yields similar to Dagmar and SY Teton, with very low test weight and below average protein (Table 41). LCS Buster was early, tall and susceptible to lodging. LCS Buster has resistance to stripe rust and tolerance 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 CoAXium herbicide resistance trait. Tested in 2023 and 2024, LCS Hammer has medium plant height, good test weight, and intermediate resistance to FHB. The area of adaptation is considered the MonDak region and tested here at or above trial average for grain protein (13.6%, trial ave. at 13.3%) and at or above trial average for yield (Table 35 and Table 41). In 2024, LCS Hammer AX yields were 96% of trial averages across all locations, doing well at all but Tetonia. LCS Hammer AX headed at trial average, 1d later than WB9668 and 4 inches taller than WB9668. LCS Hammer has intermediate reactions to stripe rust and FHB.

MT Carlson (MT1939) – from Montana AES, MT Carlson is a hard red spring wheat released in 2023 and developed for dryland conditions. MT Carlson was tested in irrigated and dryland trials in 2023 and 2024. MT Carlson yields were similar to UI Gold (Table 35) with higher test weight and grain protein (at 13.6%) and no lodging. Carlson dryland yields have been very good in higher rainfall Montana production with better end-use quality than Vida. In 2023, MT Carlson yields were 103% of trial average (Table 41), doing well in the Idaho Falls area. MT Carlson has resistance to wheat stem sawfly (similar to Vida, less than Dagmar) and is tolerant of lower pH soil. Carlson also has better endues quality than Vida.

MT Dutton (MT 1809) – a hard red spring wheat released in 2023 from Montana State University and the MAES with higher grain protein than Vida though it is moderately susceptible to wheat stem sawfly. MT Dutton has higher levels of tolerance to FHB and aluminum levels that occur in high acid soils. MT Dutton was in 3 irrigated trials and yielded 100% of trial averages (Table 41). Test weights were low and grain protein and lodging were above average.

MT Ubet (MT2030) – a new hard red spring wheat released for dryland production by Montana AES in 2024, irrigated trial results in Table 35 show MT Ubet with lower yield and test weight than average. MT Ubet was 1 day later in heading than WB6998, 1 inch shorter and lower in grain protein than average in irrigated trials. At Aberdeen (Table 37), MT Ubet had high test weight and 14.5% protein and higher than average yield. Under dryland conditions, yield of MT Ubet was above average, just below Dayn, with excellent test weight (Table 40). Proteins were at trial average.

Rocker (BZ917-277) – a hard red spring wheat being released in 2022 by Nutrien Ag Solutions for dryland production with very high test weight even under very droughty conditions in Soda Springs (Table 40). Yield was 102% of average in 2024 (Table 41), similar to Dagmar and Jefferson HF, and heading date was 3 d later than average with higher protein. Plant height is at the trial average (Table 34). Rocker was selected for tolerance to wheat stem sawfly.

SY Teton (SY10136) – Syngenta Cereals released this hard white spring wheat in 2015. In the 2022-2024 three-year averages, SY Teton was one of the highest yielding of the hard white and hard red spring wheat group (Table 33). SY Teton was 8 bu/A less than Dayn for yield, with lower test weight

and 3-4 inches shorter (Table 33) but with better end-use quality. Heading date is at trial average, similar to Dayn, and grain protein is a little low (12.2%), less than optimum 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. In 2024, SY Teton averaged 105% of trial average (Table 41), doing well in Tetonia and Soda Springs. 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, 4 bu/A less than Dayn (Table 33) with better end-use quality. UI Gold is similar to Dayn in plant height and grain protein (13.1%), with lower test weight and 2-3 days later in heading date. Both are susceptible to FHB, as are most hard white spring wheats. UI Gold is susceptible to stripe rust and will need fungicide applications in years when stripe rust is prevalent.

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 (13%) and heading 3d earlier (Table 33). 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 86% of trial average in 2024 (Table 41). 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 Platinum.

WB7313 (XD9201) – a hard white spring wheat released in 2020 from WestBred, WB7313 has greater yield potential than WB7589 and WB7696. Yield of WB7313 was similar to SY Teton across irrigated locations (Table 33) with higher test weight and grain protein (13.6%). In 2024 yields were 92% 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 33) with similar test weight and higher grain protein. Under heavy disease pressure, WB7589 was moderately resistant to stripe rust in 2016. 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 UI Platinum (Table 33). WB7696 had lower test weight, is mid-maturity with lower-than-average protein, but at 13% is acceptable for a hard white spring wheat. Three-year irrigated yields were 14 bu/A greater than Dayn, is 4 in shorter, with lower test weight and similar grain protein.

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 excellent grain protein at 14.7% (Table 33) but it 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 nematode (CCN).

WB9707 (XC9304) – WB9707 is a hard red spring wheat released by Westbred / Bayer Crop Science in 2020. In the fifth year of trial testing, WB9707 yields were at 96% trial averages (Table 41), but over the past three years yields were the highest of the hard red spring wheat varieties (Table 33), with higher test weight (61.8 lbs/bu) and good grain protein (14.0%). 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 1 day earlier than Jefferson HF, and similar in plant height. WB9707 has resistance to stripe rust and FHB tolerance.

WB9724CLP – is a two-gene Clearfield wheat with tolerance to imazamox herbicide Beyond®. (The main use of Clearfield tolerant spring wheat includes planting following beans where imazamox may have a residual presence in the soil, or to reduce wheat red volunteer in Clearfield white spring wheat production.) WB9724CLP yields have been below average under dryland conditions (93% of trial averages in Table 41), but with excellent test weight. WB9724CLP is shorter than the trial average and has a heading date 1 d later than Jefferson HF and is 1 in shorter (Table 34).

WB9749 – a hard red spring wheat in the first year of testing, WB9749 was released by Westbred / Bayer Crop Science in 2024. Yields across irrigated locations were 94% of trial averages (Table 41) and had good test weight (61.9 lbs/bu) and grain protein (13.7%). Compared to WB9668, WB9749 had lower yield, similar test weight but lower protein. WB9749 was 2 inches taller and had a similar heading date to WB9668.

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 Clearfield white spring wheat production. In 3-year summaries under dryland conditions, yields were a little below average and comparable to Jefferson HF with higher test weight and protein, and 2 inches shorter in plant height. WB9879CLP headed 1 days later than Jefferson HF (Table 34).

WB9929 – a later maturity hard spring wheat adapted to the Montana production area and carried by Circle S Seeds in 2024. WB9929 has high grain protein (14%) and good milling and baking quality. In the first year of testing in the UI EVT, WB9929 yields were 104% of trial averages (Table 41), with yield similar to Jefferson HF but with lower test weight (Table 35). WB9929 is resistant to stripe rust and has Hessian Fly resistance.

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, AP Exceed was released in 2020 by AgriPro / Syngenta Cereals. AP Exceed has done consistently well in southern Idaho, yielding 151 bu/A over the previous three years (Table 16), and 107% of trial average in 2024 (Table 27). AP Exceed yields were similar to LCS Hulk and greater than SY Ovation, was earlier and shorter than the average of the trials (Table 16) with good straw strength and had good test weight over several bad years for test weight. AP Exceed is tolerant to stripe rust and susceptible to soil borne mosaic virus.

AP Olympia (PN27MM604207) – a medium maturity soft white winter wheat from AgriPro / Syngenta released in 2023 for higher rainfall and irrigated conditions. AP Olympia yields are similar to an SY Ovation with slightly lower test weight. AP Olympia has good to excellent winter hardiness, good tolerance to BYDV and stripe rust, but is susceptible to Soil Borne Mosaic Virus (SBMV). Certified seed was available starting in the fall of 2024. This is the first year AP Olympia has been grown in the UI EVT, where yields were 102% of average, doing very well in Aberdeen (Table

22). Heading date, test weight and plant height were at trial averages (Table 18).

Appleby CL+ (ORI2161250CL+) – Appleby CL+ is an OSU soft white winter wheat released in the fall of 2019 named 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+ is intended for low to intermediate rainfall zones (eastern areas of Oregon and Washington) and was tested in the dryland trials with yields at 90% of average. Appleby CL+ suffered stand loss due to severe winter conditions in 2023. Appleby CL+ has an 4d earlier heading date than Eltan and is similar to UI Magic CL+, has good resistance to stripe rust and rated as ‘Desirable’ for end-use quality.

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 109% of average in 2024, and similar to Eltan over three years in testing (Table 17). Heading date was similar to Eltan and Otto. 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 17). 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 3-5 bu/A better when 20 lbs/A 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 excellent yields in the 3-year averages (Table 16), similar to SY Ovation in yield and heading date with lower test weight. In 2024 yields were 113% of trial averages (Table 27), reduced in previous years due to winter kill and stand reduction in Ririe (in 2023). Blackjack was 1 inch shorter than SY Ovation and 4 inches shorter than UI Sparrow. Straw strength is very good, and LCS Blackjack is resistant to stripe rust, has good stress resistance and good disease resistance to stem based diseases.

LCS Drive (LWW12-7105) – LCS Drive is a LCS ArtDeco derivative, released in 2015 from Limagrain Cereal Seeds. LCS Drive is a low protein, soft white winter wheat with irrigated yields similar to Stephens and WB

456 averaged over years and locations. In 2020, yields were below average, comparable to UI Magic CL+ and WB 456. LCS Drive wasn't included in the 2022 trials and isn't in the 3-year averages. LCS Drive can have low test weight, runs 4-6 inches shorter than average, with strong straw strength and has a good fit under irrigation with wheel lines. It is an earlier maturing variety and therefore was preferred by voles in years where vole populations were high. LCS Drive should be grown under irrigated conditions and yielded at trial average in 2024. LCS Drive was very resistant to 2016 and 2019 races of stripe rust.

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, yielding 108% of average in 2024 (Table 27). Three-year average yields were greater than SY Ovation but with similar test weight, heading date, height and grain protein (Table 16). Under dry land conditions in previous years, LCS Hulk yielded slightly higher than Eltan and UI Sparrow but wasn't included in 2024 dryland trials. LCS Hulk has high adaptability, excellent standing power, good resistance to stem based diseases. Height is 1 in taller than average and heading date is at or 1d later than trial average (Table 16). LCS Hulk has good test weight and average protein. LCS Hulk is resistant to stripe rust.

LCS Jefe (LWW17-8185) – LCS Jefe is a soft white winter wheat best suited for intermediate rainfall production areas of the PNW and trialed in these UI EVT for the first time in 2023-24. LCS Jefe was released in 2021 by Limagrain Cereal Seeds, having good stripe rust tolerance, good test weight and low protein. LCS Jefe irrigated yields were similar to AP Exceed and LCS Hulk

(Table 18). LCS Jefe was 1 inch shorter than LCS Hulk with slightly lower test weight.

LCS Shine (LCS72916) – a broadly adapted soft white winter wheat with good test weight and high yield potential in low to intermediate rainfall zone in the PNW. LCS Shine was released in 2018 and has a good quality profile derived from a cross of Bobtail and LCS Biancor. LCS Shine has excellent stripe rust and Cephalosporium stripe resistance. Shine wasn't tested in 2022 and isn't in the 3-yr summary tables. In the previous dryland trials, LCS Shine yields were comparable to UI Sparrow, and was seven days earlier in heading and 6 inches shorter than UI Sparrow. Under irrigation (Table 18), LCS Shine yields were similar to LCS Hulk, with lower test weight, was 6 in shorter and earlier in maturity.

Nimbus (OR2130755) – Nimbus is a SWW variety released by OSU in 2022 for low to intermediate rainfall production areas. Its pedigree is Carstens V/Skiles. It has most desirable (MD) end-use quality and one IMI gene conferring tolerance to imazamox (Beyond®) residues. It is tall with intermediate to early maturity. It's broadly adapted to the PNW and has good stripe rust resistance and is moderately resistant to strawbreaker foot rot (eyespot caused by *Ocumacula yallundae* and *acuformis*). Nimbus is a tall semidwarf, three inches taller than trial averages (Table 16), and had yield similar to Stephens, low test weight and higher than average grain protein over the past three years. Nimbus may lodge under high input conditions.

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 under irrigation may lodge and is recommended for dryland production

areas. Norwest Duet performed at trial average for yield and test weight over the previous 3 years (Table 17). Heading date was 1-3 days earlier than Eltan and Otto, 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 at trial average in 2022-2024 combined irrigated data, similar to UI Sparrow and greater than Stephens (Table 16). Tandem has earlier to mid-maturity, is very short with stiff straw, and performs best under irrigation. Under dryland conditions, Norwest Tandem yields were similar to Otto and greater than Eltan, with low test weight and earlier heading (5 days earlier) (Table 17). Tandem had low test weight, acceptable end use quality, and is susceptible to dwarf bunt, but has 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 17). Otto has similar or greater yield potential compared to UI Sparrow, often better than Eltan, with test weight a little less than 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. However, appropriate seed treatment is required in areas where dwarf bunt is endemic. End use quality was better than Eltan and has higher grain protein.

Perrine (WA8415) – a soft white winter wheat released in 2024 through Nutrien Ag for high rainfall and irrigated production conditions, Perrine has yielded similar to VI Shock and UI Sparrow under irrigation (Table 16) and below SY Ovation. Test weight was below trial averages and was 3 days later in heading date and 2 inches taller than trial averages with no lodging. Perrine has acceptable end use quality and has resistance to stripe rust.

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. Piranha CL+ was not tested under irrigation in 2024. In three years of testing (2021-23), Piranha CL+ did 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 dryland testing near Ririe (Table 25 and 27). Piranha CL+ emerges well after deep-planting in the dryland production areas and while it yielded very well under irrigation, Piranha CL+ may lodge under irrigated higher production conditions. Over the previous three years under dryland conditions, Piranha CL+ was a top yielding variety (Table 17), yielding more than Otto and Eltan and heading two days earlier. 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 from 2021 to 2023. While it is recommended for production in the intermediate and high rainfall areas of the PNW, in 2023-24 testing was only under dryland conditions. Sockeye CL+ has a taller plant height and may lodge under irrigation. Yields were greater than UI Sparrow and Otto (Table 17), 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 and appropriate seed treatment is required in areas where dwarf bunt is endemic.

Rollie (WA8334) – is a semi-dwarf soft white winter wheat released in 2024 by the WSU AES. Rollie is targeted for the low rainfall summer fallow-winter wheat rotation and was grown in southern Idaho in the dryland winter wheat trials. Yield in 2024 was consistently high across all dryland locations, at 122% of trial average. Rollie has good emergence when planted deep, although stand was a little below average (Table 19). Rollie has resistance to stripe rust, and carries genes for resistance to eyespot foot rot. Test weight was below average and heading date was 1 day later than Otto and 2 days later than Eltan. Rollie has good end-use quality and high falling numbers.

Stephens (OR65-116) – a 1977 soft white winter release from Oregon AES, Stephens is kept as a long-term check in Idaho EVT's. Yield under irrigation is below average (Table 16, and Table 17), yielding 88% of trial average in 2024 (Table 27, Chart 3). Stephens heading date is earlier than average and grain protein is at or below 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.

SY Assure (SY96-2) – a soft white winter wheat released in 2016 by Syngenta Cereals, yield in 2022-2024 irrigated trials was 11 bu/A less than SY Ovation (Table 16) 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 these trials, short, early varieties are at a disadvantage due to management practices that are targeted to the average. In 2022, SY Assure yields were 106% of irrigated averages while in 2023 was 84%, and in 2024 was 89% of trial averages, which also included a dryland location. Removing the dryland location, SY Assure yields were 91% of irrigated averages in 2024 (Table 27). 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, recent results (2023) reflect low test weight due to preharvest sprout after late season rain. 2024 irrigated and dryland yields were above average at 106% of trial average (Table 27), and the three-year data still places SY Ovation in the top yielding of SWW wheat varieties (Table 16). Plant height, lodging and grain protein were above average with above 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.

SY Ovation was utilized in a seeding rate test within the variety trials and was tested at

0.75, 1, 1.25 and 1.5 and 1.75% of the typically recommended seeding rate of 1 million seeds per acre. The yields between the seeding rates were not significantly different, and were 189, 188, 191, 187, and 192 bu/A, respectively (Table 18). The higher seeding rates hit anthesis a little earlier (1 day). With SY Ovation, increasing seeding rates did not increase yield, and looking at percent of average yield (Table 27), SY Ovation at the standard seeding rate was 106% of average across all locations.

Seeding Rate as a percentage of recommended (1 mill/A)	Yield as Percent of locations
SY Ovation x 0.75	98
SY Ovation x 1.00	106
SY Ovation x 1.25	103
SY Ovation x 1.50	101
SY Ovation x 1.75	102

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 2023-2024 were 10 bu/A less than the trial average (Table 16) and similar to Stephens but 2 inches shorter with lower 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 at average and similar to Norwest Tandem (Table 16). In 2024, UI Sparrow yielded 104% of trial averages over all locations (Table 27). UI Sparrow has low test weight (54.8 lbs/bu), is 3-4 days later in heading date than average and may lodge under irrigation. UI Sparrow is notable for low accumulation of cadmium in harvested grain in comparison to other soft white winter wheat produced in dryland environments (good for baby food manufacturing). Sprout 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 for yield over the past 3 years (Table 17), similar to Norwest Duet and Eltan. 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 16), similar to SY Assure, and better than UI Magic CL+ with higher test weight, 2 d later in heading date and 5 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. Yields were very high in Aberdeen, but overall was 91% of trial averages (Table 27).

VI Shock (UIL15-7223DH) – a soft white winter wheat released in 2020 for irrigated production through the UI/LCS joint venture in 3-year irrigated trials. VI Shock yields were similar to UI Sparrow (Table 16), slightly above trial averages. VI Shock also produces a lot of straw. In 2024, yield was at 108% of trial average (Table 27), doing well in Aberdeen and Rupert, but suffering winter damage and reduced spring stands in Ririe in 2023. Test weight is lower than average at 57.1 lbs/bu compared with 57.5 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, plant height is 1 inch greater than average (Table 16) and it may lodge under irrigation.

WB 456 (BU6W99-456) – a soft white winter wheat from WestBred (a unit of Bayer Crop Science). WB 456 was released in 2009 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 16) and generally has excellent test weight. Sprouting damage contributed to low test weight in the previous 2-3 years due late season rain. 2024 yields were below average, about 89% of trial entries (Table 27). 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.

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 2022-2024 (Table 16) with higher test weight. WB1529 over the past couple of years 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 in 2023 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, but yields less than WB1783. WB1529 has good milling and baking quality. WB1529 is resistant to current races of stripe rust and moderately resistant to dwarf bunt.

WB1621 – 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 2024 was at 101% of trial averages (Table 27), boosted by good performance under very stressed conditions in Rupert. Average yield was similar to WB1783 (Table 16) and greater than WB1529 by 9 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 similar to SY Ovation and less than LCS Hulk (Table 16), but with very good test weight and good straw strength. Irrigated yield in 2022 was the highest in the trials, but in 2024, irrigated yields were at 99% of trial averages (Table 27). WB1783 is very resistant to stripe rust and very susceptible to dwarf bunt. WB1783 tends to be a late variety and should be planted early in the fall to improve establishment and winter survival.

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 2024 yield at 97% of average (Table 15). Yield and grain protein were less than the dryland production averages over the previous three years (Table 5). Plant height was less than Juniper and two days later in heading. 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 averages when tested under dry land conditions (Table 5). In 2024, Irv yields were 101% of trial averages, similar to Millie with lower test weight and grain protein. In Soda Springs, spring stands of Irv averaged 15% in 2023 and 55% in 2024. 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 at average in dryland trials in southern Idaho high test weight and yield similar to Scorpio and Balance. Grain

protein over the past three years under irrigation was 12.9% (Table 4). Millie has good stripe rust resistance and 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 Silver (IDO658B) – a hard white winter wheat released in 2011 by the University of Idaho AES. UI Silver yields were above trial averages under dry land conditions with very 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

Artek (Apst-52) – Nutrien’s newest hard red winter wheat release, Artek was tested in these trials for two years. In 2023, Artek yields were slightly below trial average for the irrigated nurseries. In 2024, Artek performed at 96% of trial averages for yield (excluding Rupert nursery due to high degree of variability). Artek is early to mid-maturity, shorter than Keldin by four inches, below trial average for test weight, and had 12.4% grain protein (Table 6).

Balance (WA8248) – a hard red winter wheat released in 2020 by Nutrien Ag Solutions, Bozeman, MT, tested in the trials from 2021. Average irrigated yield was 10 bu/A less than Yellowstone and FourOsix over the past three years (Table 4). Overall in 2024 Balance yields were 95% of yield

average (Table 15). Balance had very high grain protein (13.5%), average test weight, and was average for plant height, 1 inch shorter than Keldin.

Curlew (UT9325-55) – a medium maturity hard red winter wheat released in 2009 by the Utah AES for the dryland production areas of southern Idaho and northern Utah in 2009. Curlew yields are comparable to UI SRG and Utah 100 under dryland conditions and is agronomically similar to Utah 100, is an inch taller with better test weight and higher protein (Table 7). Curlew is very resistant to dwarf bunt, and is moderately resistant to stripe rust.

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. In the 3-year summaries, Flathead yields were similar to Yellowstone with higher test weight (Table 4). In 2023, yield of Flathead was 112% of irrigated trial average doing very well in Ririe (120% of trial average), while in 2024, yields were at trial average. Test weight and grain protein of Flathead is good to excellent. Flathead had similar lodging and lower protein than Yellowstone (Table 4).

FourOsix (MT1462) – a hard red winter wheat 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 similar yield and slightly lower grain protein than Yellowstone, with the similar test weight and was 2-4 in shorter (Table 4). FourOsix

has better resistance to stripe rust than Yellowstone with less lodging. In the dryland trials, winter stands of FourOsix and the other Montana lines were much greater than average (Table 5). FourOsix performed very similarly to Yellowstone in the dryland trials and was 2 inches shorter. In the 2024 trials, FourOsix did very well in Soda Springs and averaged 110% of location averages. FourOsix is very susceptible to dwarf bunt and should have appropriate seed treatment to prevent infection.

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 3 bu/A below the average for the trials (Table 5 and 7). 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 – a hard red winter wheat from Highland Specialty Grains in Washington released in 2021 having better resistance to stripe rust than LCS Jet and Keldin. Kairos is 5-6 inches shorter than the trial averages in the 3-yr summaries (Table 4), and 2-3 days earlier in heading. Yield averages over the previous three years have been 10 bu/A below average, lower than the hard white winter wheat Millie. Kairos yields in 2024 were 95% of irrigated average.

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, and in 2024, Keldin yields were 104% of average (Table 15). Keldin is a little shorter than average for height, has very high test weight, and is at average for grain protein (12.4%). Keldin is susceptible to dwarf bunt and in 2016 and 2018 was moderately susceptible to prevalent 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 per acre was included in-furrow. In Table 4 (3-year irrigated averages), Keldin and Keldin +11-52-0 were within 4 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 yields were the same as Keldin. 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. Starter fertilizer has greater advantages under dryland conditions where soil fertility is lower than under high input irrigated production.

LCS Blackbird (LWH18-0122) – recently released (2022) by Limagrain Cereal Seeds, LCS Blackbird performed well in the first year of testing in southern Idaho trials (Table 6), agronomically similar to Yellowstone in yield, heading 1 day earlier in heading, with higher grain protein and 2 inches shorter. LCS Blackbird yields were 106% of irrigated averages, on par with Keldin but having significantly lower test weight. LCS Blackbird has resistance to crown rot, is moderately resistant to C-stripe and strawbreaker foot rot (eyespot) and is

intermediate in reaction to stripe rust. End use quality of LCS Blackbird is acceptable.

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, just below Keldin. In 2022, LCS Jet yielded 112% of irrigated mean, while in 2023, yields were 99% of irrigated averages. In 2024, yields were 106% of trial averages. Test weight is below average, and LCS Jet is 3 inches shorter than Keldin with good straw strength. LCS Jet is very susceptible to dwarf bunt and showed sensitivity to winter kill in 2023 and 2024 (Table 7). In 2019, LCS Jet showed an increase stripe rust susceptibility with a susceptible infection type. LCS Jet is susceptible to SBMV, has good resistance to eyespot and crown rot, and moderately resistant to C-stripe. LCS Jet has good (desirable) end use quality.

LCS Missile (LWH19-0192) – recently released from the LCS breeding program in 2022, LCS Missile is a broadly adapted hard red winter wheat that that yielded at 105% of all location averages in 2024 (irrigated and dryland locations, Table 15). In the first year of testing, LCS Missile yields were 2 bu/A less than Keldin, with lower test weight and grain protein and was 1-2 inches shorter (Table 6) and 1 day later in heading. Under dryland conditions, LCS Missile yielded similar to UI SRG with lower test weight, less winter hardiness, and 5 inches shorter in plant height (Table 7). LCS Missile has good tolerance to crown rot and has intermediate resistance to stripe rust. End use quality is listed at “Desirable.”

Milestone (ACS14132-412) – a hard red winter wheat released in 2020 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 2024, irrigated yields were 100% of average. Over three years, Milestone yields were just below Keldin (Table 4). Milestone was similar to LCS Jet with higher test weight, similar heading date and grain protein. Milestone is 3-4 inches shorter than Yellowstone with greater straw strength. Milestone is susceptible to dwarf bunt.

NuMont (MT1491) – NuMont hard red winter was recently released (2023) 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 2024, NuMont yields were low at Ririe (Table 13), and greater than UI SRG in Soda Springs (Table 14). It wasn't included at Rockland, so average data for the year isn't available. NuMont has similar test weight as Yellowstone but lower grain protein.

Promontory (UT1567-51) – a hard red winter wheat released by Utah AES in 1991. 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 below average. In 2024, yields of Promontory were 80% of dryland average yield. 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 147 bu/A (Table 4) with no lodging, and Scorpio was 5 inches shorter than Yellowstone. Test weight was less than average. Scorpio should be well-adapted to no-till situations with low pH soils as it has aluminum tolerance. In dry land trials, Scorpio yields were below average, similar to Promontory with low test weight. Scorpio had moderately susceptible reactions 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 greater than Keldin and Juniper over the three previous years (Table 5) and were similar to UI Silver. Test weight and grain protein were less than average, 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 at or above dry land average, less than Yellowstone with slightly lower test weight (Table 5). In the past three years UI SRG

showed some susceptibility to winter kill. 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, especially in the Soda Springs area.

Utah 100 (UT1650-150) – a hard red winter wheat released in 1996 by the Utah AES. Utah 100 has consistently done well dry land conditions for yield, but recently due to poor winter hardiness, yields have been low. In 2024, dry land yields averaged 113% of trial averages. It is taller than average with lower grain protein (Table 7). 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 2024 trials, WB4303 yields, test weight and grain protein were similar to Milestone, and yielded 100% of irrigated averages (Table 15). In 2023 trials, WB4303 yields were similar to Keldin and Milestone, showing similar test weight, 4d earlier heading, and 9 inches shorter in plant height than Yellowstone with comparable grain protein. WB4303 did poorly under dryland conditions due to winter kill. WB4303 has good milling and baking quality and is resistant to soil borne mosaic virus (SBMV).

WB4401 (XC4109) – an awned, 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. Average 2022-24 were similar to Yellowstone with greater test weight, lower protein and greater straw strength. It is early to medium maturity and 2024 yields were 102% of trial average,

2023 yields were 110% of trial average, 2022 yields were 100%, and in 2021 irrigated yields were 108% of average. WB4401 similar in height to Keldin, 3 days earlier in heading and lower in grain protein. Under dryland conditions in 2023, winter kill reduced the spring stand and yield of WB4401. WB4401 is moderately resistant to resistant to stripe rust, powdery mildew and soil borne mosaic virus. WB4401 has higher levels of tolerance to Fusarium head blight (scab).

WB4422 – a hard red winter wheat from Westbred / Bayer Crop Sciences with excellent test weight and grain protein that was tested for the first time in this year's irrigated trials. Rupert trials were severely affected by late season frosts. Excluding Rupert, trial averages were at 96% of trial averages. WB4422 was 2 inches shorter than Keldin, one day earlier in heading, and higher in grain protein. WB4422 has resistance to soil borne mosaic virus but is susceptible to stripe rust. Milling and baking quality is good.

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 from 2021-23, WB4510CLP yielded 153 bu/A, 4 bu/A less than Keldin. WB4510CLP had excellent test weight, with similar grain protein and heading date to Keldin. In 2024, WB4510CLP was only entered into the dryland trials, where yields were 89% of average, similar to Juniper (Table 15). In the dry land 3-year averages, yields were similar to Juniper and Promontory, below trial averages (Table 5). WB4510CLP has been sensitive to winter kill in Soda Springs.

WB4510CLP is medium maturity, has good test weight and is about average for plant height. WB4510CLP has very good resistance to stripe rust and powdery mildew and acceptable end use quality.

WB4640 – a hard red winter wheat from Westbred / Bayer Crop Sciences that was tested for the first time in this year's irrigated trials. WB4640 yields were similar to Keldin with excellent test weight and average grain protein. WB4640 had the same heading date as Keldin and was 1 inch shorter (Table 6). Rupert trials were severely affected by late season frosts. Excluding Rupert, WB4640 yields were at 104% of trial averages. WB4640 is moderately resistant to moderately susceptible to stripe rust. End use quality of WB4640 is very good.

WB4733CLP – a Clearfield Plus variety, WB4733CLP is a hard red winter wheat released by WestBred (a unit of Bayer Crop Science) in 2024. Clearfield lines are imitolerant winter wheat containing two genes for tolerance to BASF's grass herbicide Beyond® (imazamox). In the first year of testing in the dry land trials, WB4733CLP yields were less than trial average and close to Promontory (Table 7), with lower test weight and higher grain protein. Over three locations, yields were 89% of trial averages. Winter hardiness of WB4733CLP was less than WB4445CLP, and less than trial averages. WB4733CLP is solid-stemmed and resistant to wheat stem-sawfly and stripe rust, and has good milling and baking quality.

WB4739AX – In areas where grassy weeds are problematic and herbicide carryover can be problematic after use of imazamox herbicide, wheat with tolerance to Aggressor® herbicides (Co-AXium® Wheat

Production systems) are an alternative. WB4739AX is a Westbred / Bayer Crop Science hard red winter wheat with tolerance to the ACCase inhibiting herbicide. In dryland trial testing, yield and heading date was similar to WB4510CLP, with lower test weight and protein. Overall, yields were 97% of trial averages, yielding below irrigated averages but showing excellent test weight and grain protein (Table 6). It was medium maturity and 1 inch shorter than Keldin. WB4739AX is moderately resistant to resistant to stripe rust and bacterial leaf streak (as measured in the Central Plains). Milling and baking quality are good.

Yellowstone (MT00159) – a hard red winter wheat with excellent yield potential in both irrigated (Table 4) and dry land conditions (Table 5) of southeast Idaho. Yellowstone was released by Montana State University and the AES in 2005 and is taller than average, has good test weight and high grain protein. Yields were a little less than Keldin and LCS Jet, and in 2024, yields were 103% of trial average. Yellowstone and the other Montana hard winter wheat have good to excellent winter hardiness as demonstrated in the dryland trial at Soda Springs in 2023 and 2024 (Table 14). 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. Seed treatments are recommended to prevent dwarf bunt infection when produced in areas where dwarf bunt is endemic.

Table 3. Ten year averages of selected agronomic characteristics, 2014-2023 compared to 2024.

NOTE: "Average" values are for years 2014 to 2024

Winter Wheat (all market classes and locations)

YIELD			*TEST WEIGHT			PLANT HEIGHT			HEADING DATE				LODGING		
Year	Loc.	bu/A	Year	Loc.	lb/bu	Year	Loc.	in.	Year	Loc.	date	Days fr. Jan.1	Year	Loc.	%
2022	6	115	2017	6	60.8	2015	6	35	2022	6	6/13	165	2014	5	25
2023	3	115	2018	6	60.3	2022	6	35	2019	6	6/12	164	2016	6	11
2018	7	104	2020	7	60.2	2016	6	35	2023	3	6/12	164	2021	6	11
2015	6	103	2019	6	60.0	2023	3	34	2021	6	6/9	161	Avg.	---	6
2020	7	102	2016	6	59.4	2018	7	33	2024	6	6/9	161	2022	6	5
2014	4	101	2024	6	59.3	2019	6	33	2020	7	6/8	160	2015	6	4
Avg.	---	101	Avg.	---	58.5	Avg.	---	33	Avg.	---	6/7	159	2019	6	3
2019	6	99	2015	6	58.1	2014	5	32	2017	6	6/6	159	2018	7	1
2021	6	95	2023	3	57.6	2021	6	31	2014	5	6/4	157	2017	6	0
2016	6	94	2021	6	56.4	2024	6	31	2018	7	6/4	157	2020	7	0.4
2024	6	92	2014	4	56.1	2020	7	30	2016	6	5/31	152	2024	6	0.2
2017	6	91	2022	6	55.6	2017	6	29	2015	6	5/31	152	2023	3	0

Spring Wheat (all market classes and locations)

YIELD			*TEST WEIGHT			PLANT HEIGHT			HEADING DATE				LODGING		
Year	Loc.	bu/A	Year	Loc.	lb/bu	Year	Loc.	in.	Year	Loc.	date	Days fr. Jan.1	Year	Loc.	%
2014	5	107	2016	5	61.9	2020	5	34	2022	5	6/30	182	2014	4	16
2023	5	107	2020	5	61.6	2023	5	34	2024	5	6/30	182	2021	5	5
2018	5	106	2017	5	61.6	2014	4	34	2019	4	6/28	180	2022	5	5
2020	5	101	2015	5	61.0	2019	5	34	2023	5	6/27	179	Avg.	---	4
2019	5	100	2018	5	61.0	2022	5	33	2020	5	6/25	177	2019	5	4
Avg.	---	98	2019	5	60.8	2024	5	33	2017	5	6/24	176	2023	5	3
2017	5	98	2024	5	60.6	Avg.	---	32	Avg.	---	6/24	176	2016	5	3
2015	5	97	Avg.	---	60.2	2018	5	31	2016	5	6/21	173	2015	5	2
2022	5	96	2022	5	60.0	2021	5	31	2018	5	6/20	172	2017	5	1
2016	5	91	2023	5	59.2	2016	5	31	2021	5	6/20	172	2024	5	1
2021	5	89	2021	5	58.4	2015	5	30	2015	5	6/18	170	2018	5	0.3
2024	5	89	2014	5	56.5	2017	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	Loc.	bu/A	Year	Loc.	lb/bu	Year	Loc.	in.	Year	Loc.	date	Days fr. Jan.1	Year	Loc.	%
2016	5	129	2016	5	53.6	2014	4	36	2023	5	7/3	185	2014	4	56
2017	4	128	2020	5	53.5	2019	5	35	2024	5	7/2	185	2019	5	31
2014	4	127	2024	5	52.8	2023	5	34	2019	4	6/30	182	2015	4	24
2015	4	124	2022	5	51.9	2018	5	34	2022	5	6/30	182	2021	5	18
2020	5	119	2019	5	51.5	2020	5	33	2020	5	6/28	180	2023	5	18
2018	5	117	2017	4	51.4	2022	5	33	Avg.	---	6/26	178	Avg.	---	18
2023	5	117	Avg.	---	51.5	2024	5	33	2021	5	6/25	177	2017	4	17
Avg.	---	116	2018	5	51.4	Avg.	---	33	2017	4	6/24	176	2016	5	11
2019	5	111	2015	4	50.6	2015	4	33	2014	4	6/24	176	2018	5	10
2022	5	107	2023	5	50.6	2017	4	31	2018	5	6/24	176	2022	5	5
2021	5	100	2021	5	50.1	2021	5	31	2016	5	6/20	172	2024	5	3
2024	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 (2022-2024; 11 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
Keldin	155	60.4	99	6/6	38	1	12.4
Milestone	152	59.2	98	6/6	37	0	12.2
LCS Jet	152	57.8	99	6/6	35	0	12.3
Keldin + 11-52-0	151	60.1	99	6/6	38	2	12.5
MT1745	150	60.4	98	6/8	39	0	12.3
Flathead	150	61.5	99	6/2	39	0	12.2
Yellowstone	150	59.6	99	6/6	40	1	12.4
FourOsix	150	60.0	99	6/7	38	0	12.2
WB4401	149	61.5	98	6/3	38	0	11.9
Scorpio	147	58.1	97	6/7	35	0	12.2
Millie (W)	142	60.1	98	6/6	38	0	12.9
Balance	140	59.5	96	6/5	37	1	13.5
Kairos	138	59.2	96	6/3	32	0	12.0
Average	148	59.8	98	6/5	37	0.4	12.4
LSD ($\alpha=.05$)	6	0.6	2	0.5	1	2	1.1
CV (%)	10.2	2.3	5.3	0.8	5.2	865	1.7

* 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 (2022-2024; 7 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
Yellowstone	40	58.0	98	6/21	28	11.7
FourOsix	39	57.5	92	6/20	26	11.8
MT1745	39	58.3	92	6/21	26	11.5
Sequoia	36	57.0	91	6/23	32	10.8
UI Silver	36	59.1	95	6/18	29	11.5
Flathead	36	58.4	98	6/16	27	11.4
LCS Jet	36	54.7	82	6/20	22	11.3
Keldin	35	58.0	91	6/20	27	11.6
Keldin + 11-52-0	35	58.6	87	6/19	26	11.7
UI SRG	35	57.8	94	6/21	31	11.6
Golden Spike (W)	34	57.6	91	6/22	31	11.1
Millie (W)	34	58.2	88	6/21	26	12.2
Juniper	33	59.1	92	6/20	32	12.3
WB4510CLP	33	60.0	91	6/19	26	11.3
Promontory	32	58.4	89	6/21	34	12.2
Scorpio	31	55.3	81	6/21	24	11.8
Irv (W)	30	56.5	80	6/19	25	11.9
Average	35	57.8	90	6/20	28	11.6
LSD ($\alpha=.05$)	3	1	7	2.5	1	1
CV (%)	17.4	3.4	14.4	2.8	6.3	5.9

*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, Ririe and Rupert 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
WA8401	150	60.2	100	6/5	37	0	10.4
FourOsix	150	61.7	100	6/1	37	0	12.0
LCS Jet	150	59.2	100	6/1	36	1	12.1
HSG108	149	58.4	100	6/2	36	0	10.9
HSG124	149	59.7	100	6/1	35	0	10.8
Apst-132	149	60.4	100	6/3	35	0	11.5
HSG110	148	60.2	100	5/31	35	4	11.1
WA8399	147	59.7	100	6/4	36	0	10.6
WA8405	147	62.0	100	6/1	36	0	10.4
HSG132	147	60.7	100	6/3	34	0	11.4
Yellowstone	146	60.0	100	6/2	38	0	11.8
LCS Blackbird	146	59.9	100	6/1	36	0	12.1
Keldin	145	62.0	100	6/1	38	0	12.2
WA8398	144	59.2	100	6/3	36	0	11.0
WB4640	144	62.5	100	6/1	37	0	11.9
LCS Missile	143	60.4	100	6/2	36	0	11.9
WB4401	143	62.4	100	5/28	36	0	11.2
UT11307-3	142	60.7	100	6/2	34	0	11.6
Milestone	142	60.7	100	6/1	36	0	12.0
WB4303	142	60.6	100	5/29	35	0	11.9
Scorpio	141	60.3	100	6/2	36	0	12.0
Flathead	140	62.7	100	5/28	37	0	12.2
Greenville	139	60.8	100	6/1	34	0	12.3
UT11532-2	139	60.6	100	6/4	33	0	11.6
Keldin + 11-52-0	139	61.8	100	6/1	38	1	12.4
UT11408-8	139	60.7	100	6/3	33	0	11.5
Millie (W)	138	62.2	100	6/1	36	0	12.4
MT1745	138	62.1	100	6/2	37	0	12.4
OR2190165R	136	61.4	100	5/31	36	0	12.4
OR2190064R	136	61.1	100	6/2	36	0	12.2
Kairos	136	60.4	100	5/29	33	0	12.2
WB4739AX	135	62.2	99	6/1	37	0	12.6
UT11412-2 (W)	135	61.0	99	6/2	33	0	12.0
OR2190160R	134	60.6	100	6/1	35	0	12.4
Balance	132	61.6	100	5/31	36	2	12.6
WB4422	132	62.5	100	5/31	36	0	12.9
DBDH18-36	127	59.8	100	5/28	34	0	11.3
Artek	127	59.9	100	5/29	34	0	12.4
DBDH18-17	120	60.7	100	6/1	35	0	12.1
Average	141	60.8	100	6/1	36	0.2	11.8
LSD ($\alpha=.05$)	9	0.5	0.4	0.7	2	2	0.7
CV (%)	9.3	1.2	0.6	0.6	6.3	1514	4.1

* 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, Ririe and Rockland 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
Yellowstone	33	59.4	96	6/17	27	12.0
WA8398	33	54.3	93	6/19	23	11.1
UT11227-4 (W)	32	60.4	88	6/21	35	11.7
UI Silver (W)	31	61.1	93	6/10	28	11.6
Utah-100	31	59.5	97	6/18	28	11.4
MT1745	31	59.5	86	6/17	25	11.9
WA8401	30	58.2	95	6/19	24	11.0
Sequoia	30	59.4	86	6/19	32	10.3
FourOsix	30	59.1	85	6/16	24	12.1
WA8399	30	57.8	96	6/19	23	9.7
UI SRG	30	59.9	93	6/17	28	11.4
LCS Missile	29	58.4	85	6/18	23	11.5
Curlew	29	59.6	82	6/18	29	12.9
Golden Spike (W)	28	58.7	83	6/19	30	11.6
Keldin + 11-52-0	28	59.6	79	6/17	25	11.8
LCS Jet	28	56.4	82	6/17	22	12.0
UT11319-9 (W)	28	60.6	83	6/18	28	13.1
WB4510CLP	27	61.8	87	6/16	25	11.6
WB4739AX	27	60.4	90	6/16	24	11.3
UT11426-2 (W)	27	60.5	88	6/19	35	12.6
Millie (W)	27	60.3	83	6/17	23	12.3
Keldin	26	59.6	83	6/17	26	12.5
OR2190064R	26	58.7	89	6/19	21	11.9
UT11417-6 (W)	26	61.5	85	6/18	29	12.1
Scorpio	26	58.3	83	6/18	23	12.3
Irv (W)	25	58.9	82	6/17	24	11.8
Juniper	25	60.4	87	6/18	31	13.2
Flathead	24	60.5	98	6/14	25	11.8
OR2190165R	24	59.1	90	6/16	23	12.3
OR2190160R	23	58.3	87	6/18	22	12.1
WB4445CLP	23	60.3	92	6/14	23	12.9
WB4733CLP	23	59.6	80	6/16	21	13.2
Promontory	22	60.4	83	6/19	30	12.9
DBDH18-36	22	56.2	82	6/14	22	11.8
DBDH18-17	18	57.7	88	6/17	24	11.8
Average	27	59.3	87	6/17	26	11.9
LSD ($\alpha=.05$)	5	1	13	4	2	2
CV (%)	24.7	1.7	18.6	3.1	7.5	7.9

* 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, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2022	2023	2024*					
UT11532-2	---	---	192	61.3	5/29	39	0	10.5
LCS Blackbird	---	---	191	60.4	5/24	40	0	11.7
WA8399	---	---	188	59.7	5/29	41	0	9.9
FourOsix	172	156	187	61.5	5/26	41	0	11.6
WA8401	---	---	186	59.6	5/28	42	0	9.8
Apst-132	---	---	186	60.7	5/26	39	0	11.2
LCS Jet	182	149	185	60.2	5/24	42	5	11.8
HSG124	---	---	184	59.2	5/24	39	0	9.6
WA8405	---	---	181	62.1	5/24	40	0	10.1
Yellowstone	177	169	178	60.6	5/25	43	0	11.0
UT11408-8	---	---	178	60.6	5/27	39	0	10.4
WA8398	---	---	177	60.5	5/27	40	0	10.2
Keldin	201	170	177	62.4	5/24	41	0	11.3
HSG108	---	133	176	58.9	5/24	43	0	10.1
LCS Missile	---	---	176	60.8	5/25	39	0	11.3
HSG132	---	---	175	61.0	5/26	39	1	10.2
UT11307-3	---	---	175	61.1	5/25	43	0	10.7
WB4640	---	---	174	63.4	5/23	40	0	10.9
HSG110	---	---	174	60.3	5/23	41	18	10.5
Scorpio	172	157	172	60.6	5/26	40	0	11.0
WB4401	176	167	172	62.5	5/20	42	0	10.8
Greenville	---	---	171	61.8	5/25	38	0	11.5
WB4303	---	167	171	61.6	5/20	39	0	11.2
Keldin + 11-52-0	179	163	170	62.4	5/24	40	3	10.7
Flathead	171	177	169	63.1	5/21	42	0	11.6
OR2190160R	---	---	169	62.3	5/23	39	0	11.6
Kairos	155	135	168	61.2	5/22	39	0	11.5
Milestone	158	168	167	61.1	5/24	40	0	10.9
OR2190165R	---	---	166	62.3	5/23	41	0	11.7
UT11412-2 (W)	---	---	165	60.6	5/26	39	0	10.7
OR2190064R	---	145	165	62.0	5/25	40	0	11.6
WB4422	---	161	164	63.4	5/23	38	0	11.8
WB4739AX	---	---	162	62.8	5/23	42	0	11.7
MT1745	178	173	161	62.4	5/26	40	0	11.9
Artek	---	160	161	61.7	5/21	40	0	11.4
Balance	161	146	159	62.0	5/23	41	8	11.6
Millie (W)	160	140	157	62.6	5/23	39	0	11.5
DBDH18-17	---	---	150	61.3	5/24	39	0	11.7
DBDH18-36	---	---	140	60.2	5/21	39	0	10.3
Average	169	158	172	61.3	5/24	40	1	11.0
LSD (0.05)	18	17	19	0.8	1.8	4	9	---
CV (%)	7.4	7.7	7.8	0.9	0.9	6.6	758	---

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

All plots had full stand.

(W) = White.

Table 9. Agronomic Data for Hard Winter Wheat at Rupert, Irrigated, 2024.

Variety or Selection	Yield (bu/A)**			Test Wt. (lb/bu)	Heading Date	Height (in.)	Protein (%)
	2021	2022	2024*				
WA8399	---	---	91	60.6	6/4	34	10.9
WA8401	---	---	88	60.5	6/5	35	10.8
LCS Jet	159	146	87	57.2	6/1	36	11.3
WA8398	---	---	87	58.6	6/4	34	10.6
FourOsix	157	127	84	60.3	6/1	34	11.7
LCS Missile	---	---	83	59.9	6/2	35	11.3
Flathead	167	144	82	60.6	5/29	36	12.1
UT11307-3	---	---	82	59.4	6/3	31	11.2
WA8405	---	---	81	60.8	6/2	35	10.2
LCS Blackbird	---	---	81	58.5	6/2	35	11.6
Keldin	168	146	79	60.5	6/1	38	11.7
DBDH18-36	---	---	79	58.2	5/29	34	12.0
WB4401	174	112	78	60.9	5/28	36	12.0
HSG108	---	---	78	57.1	6/3	35	10.3
Greenville	---	---	77	60.1	6/3	32	12.2
MT1745	164	124	74	61.2	6/2	33	12.7
Balance	168	132	74	60.2	5/31	32	12.7
Yellowstone	169	117	74	58.2	6/2	35	11.7
UT11412-2 (W)	---	---	72	60.6	6/4	33	12.1
HSG110	---	---	71	57.7	6/2	32	11.2
UT11532-2	---	---	71	59.6	6/3	33	12.1
Milestone	156	150	68	59.6	6/1	33	12.2
Scorpio	149	131	68	59.4	6/2	33	12.2
HSG124	---	---	68	58.0	6/2	33	10.9
WB4303	---	---	67	57.2	5/30	33	11.4
Apst-132	---	---	66	58.9	6/4	34	11.9
HSG132	---	---	66	59.1	6/3	30	11.8
OR2190064R	---	---	65	59.7	6/3	34	12.8
Millie (W)	149	111	65	60.3	6/2	34	12.6
WB4739AX	---	---	64	61.1	6/2	34	12.3
DBDH18-17	---	---	63	59.5	6/2	34	12.1
Keldin + 11-52-0	162	151	62	60.2	6/2	36	13.1
WB4640	---	---	61	59.9	6/1	35	12.9
Kairos	151	127	61	57.8	5/29	32	12.7
UT11408-8	---	---	58	59.2	6/4	32	12.6
WB4422	---	---	55	59.8	5/31	34	13.9
OR2190165R	---	---	55	59.2	6/2	34	13.1
OR2190160R	---	---	48	56.3	6/2	34	12.8
Artek	---	---	33	54.6	5/30	34	13.8
Average	156	128	71	59.2	6/2	34	12.0
LSD ($\alpha=0.05$)	13	23	16	1.4	1.4	4	---
CV (%)	5.9	11.6	16.6	1.6	0.6	8.1	---

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

2024 Yields were damaged due to June 18, 19 frost events.

** 2023 trials were damaged due to cold temperatures and were plowed under.

(W) = Hard White Winter

All plots had full stand. No lodging to report.

Table 10. Agronomic Data for Hard Winter Wheat at Aberdeen, Irrigated, 2024.

Variety/Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
HSG124	---	---	175	61.0	98	6/2	35	11.1
WB4640	---	---	167	63.5	99	6/1	36	12.2
HSG110	---	---	167	61.5	100	6/1	34	11.3
Apst-132	---	---	167	60.8	100	6/5	34	11.5
WA8401	---	---	166	60.8	98	6/5	35	9.9
HSG132	---	---	163	61.4	100	6/4	33	11.8
LCS Jet	165	150	163	60.2	100	6/2	34	12.6
WA8405	---	---	162	62.7	99	6/1	35	10.4
WA8398	---	---	162	59.9	100	6/5	34	11.0
HSG108	---	149	162	59.0	100	6/2	35	11.8
Millie (W)	163	145	161	63.0	100	6/1	35	12.8
WB4303	---	159	160	62.1	100	5/28	35	12.4
FourOsix	153	164	159	62.2	100	6/1	37	11.9
Keldin	141	160	158	62.5	100	6/1	36	12.9
Yellowstone	155	161	158	61.1	100	6/2	39	12.3
MT1745	167	160	158	62.2	100	6/4	38	12.6
Kairos	156	144	156	61.0	99	5/30	32	12.0
Greenville	---	---	155	60.8	100	6/1	32	12.5
Keldin + 11-52-0	151	158	155	62.2	100	6/2	38	12.9
UT11408-8	---	---	154	61.8	100	6/3	31	11.3
Scorpio	154	162	154	60.5	100	6/4	36	12.6
WA8399	---	---	153	59.0	100	6/5	36	10.4
WB4422	---	156	153	63.6	100	5/31	37	12.9
UT11307-3	---	---	151	61.8	100	6/1	31	11.4
Artek	---	145	151	61.6	100	5/31	32	12.0
OR2190165R	---	---	151	62.0	100	6/1	36	12.6
WB4401	154	167	150	63.2	100	5/28	34	10.4
LCS Missile	---	---	150	60.8	100	6/2	35	12.2
OR2190160R	---	---	150	61.9	100	6/1	34	12.5
Milestone	177	159	149	60.9	100	6/2	35	12.5
WB4739AX	---	---	149	62.5	100	6/1	36	13.4
LCS Blackbird	---	---	148	60.8	100	6/1	34	12.0
UT11532-2	---	---	145	60.9	100	6/4	28	11.3
Flathead	144	162	144	63.6	100	5/28	35	12.1
OR2190064R	---	149	143	61.5	100	6/5	35	11.5
UT11412-2 (W)	---	---	139	61.8	98	6/2	31	12.0
Balance	136	148	138	62.3	100	6/1	37	12.5
DBDH18-36	---	---	131	60.7	100	5/28	33	10.6
DBDH18-17	---	---	119	61.4	100	6/1	34	12.1
Average	155	156	154	61.5	100	6/1	35	11.9
LSD ($\alpha=.05$)	23	15	21	1	1	1	3	---
CV %	10.5	6.9	9.8	1.4	1.0	0.5	5.6	---

* 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, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
Milestone	160	136	184	61.4	100	6/8	37	12.4
HSG132	---	---	182	61.1	100	6/9	32	11.7
HSG108	---	---	180	58.7	100	6/9	33	11.5
HSG110	---	---	179	61.2	100	6/7	32	11.4
Apst-132	---	---	175	61.2	100	6/9	32	11.5
OR2190165R	---	---	174	62.2	100	6/7	35	12.3
Yellowstone	158	133	173	62.2	100	6/8	36	12.2
OR2190064R	---	112	172	61.1	100	6/9	34	12.8
WB4640	---	---	172	63.3	100	6/8	36	11.7
OR2190160R	---	---	171	62.0	100	6/9	34	12.5
Scorpio	142	120	171	60.6	100	6/9	34	12.3
WB4401	155	137	170	62.9	100	6/5	35	11.7
Millie (W)	148	111	170	62.8	100	6/9	35	12.7
LCS Blackbird	---	---	169	60.0	100	6/9	33	13.1
LCS Jet	163	141	169	59.6	100	6/9	34	12.8
FourOsix	149	132	169	62.7	100	6/8	36	12.8
WB4303	---	139	169	61.5	100	6/5	34	12.5
HSG124	---	---	168	60.7	100	6/8	33	11.5
Keldin + 11-52-0	167	148	168	62.6	100	6/7	38	12.9
Keldin	177	151	167	62.6	100	6/8	36	12.4
WB4739AX	---	---	166	62.5	98	6/8	36	12.9
WA8405	---	---	165	62.7	100	6/9	36	10.9
UT11408-8	---	---	164	61.2	100	6/9	30	11.8
UT11412-2 (W)	---	---	163	61.1	100	6/9	31	13.0
LCS Missile	---	129	163	60.0	100	6/9	35	12.8
Artek	---	---	163	61.9	100	6/6	31	12.2
WA8401	---	---	161	60.0	100	6/12	36	11.2
UT11307-3	---	---	160	60.5	100	6/9	32	13.1
MT1745	---	---	159	62.6	100	6/9	37	12.5
DBDH18-36	159	125	159	60.0	100	6/4	32	12.1
Balance	151	109	158	62.0	100	6/8	36	13.7
Kairos	142	144	158	61.7	100	6/5	30	12.7
WA8399	---	---	158	59.6	100	6/11	35	11.1
WB4422	---	130	157	63.3	100	6/7	35	13.0
Greenville	---	---	153	60.6	100	6/9	33	13.1
WA8398	---	---	152	57.9	100	6/9	35	12.3
Flathead	162	159	150	63.1	100	6/4	37	12.8
UT11532-2	---	---	149	60.6	100	6/9	30	12.5
DBDH18-17	---	---	148	60.8	100	6/9	34	12.4
Average	150	133	166	61.4	100	6/8	34	12.3
LSD ($\alpha=.05$)	16	17	17	0.8	1	1.0	2	---
CV (%)	7.7	9.1	7.1	0.9	0.8	0.5	4.1	---

* 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 Rockland, Dryland, 2024.

Variety or Selection	Yield (bu/A)**			Test Wt. (lb/bu)**	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2021	2022	2024*					
UI Silver (W)	14	43	39	62.0	91	6/14	31	12.3
WA8401	---	---	38	58.9	93	6/15	27	10.8
UI SRG	18	40	38	60.6	93	6/12	34	13.9
Utah-100	---	---	37	54.1	96	6/14	32	13.5
WA8398	---	---	37	59.6	90	6/16	27	12.7
WA8399	---	---	36	59.1	97	6/17	26	10.9
Curlew	---	---	35	60.9	83	6/14	33	13.6
Golden Spike (W)	13	35	35	60.8	96	6/15	35	12.7
WB4510CLP	15	42	35	62.3	83	6/9	28	13.6
MT1745	17	55	34	60.5	85	6/13	29	13.0
UT11227-4 (W)	---	---	34	61.3	75	6/20	41	14.1
UT11319-9 (W)	---	---	34	62.0	85	6/13	32	14.1
Sequoia	11	40	33	59.9	78	6/15	38	12.9
Keldin + 11-52-0	16	50	32	60.6	72	6/11	29	13.8
Yellowstone	17	49	32	60.0	93	6/12	31	14.0
Flathead	15	56	32	61.0	95	6/10	29	13.5
Millie (W)	12	44	32	61.4	84	6/11	26	13.8
LCS Missile	---	---	31	59.0	78	6/11	28	12.5
UT11417-6 (W)	---	---	31	62.3	81	6/14	34	14.5
OR2190165R	---	---	31	60.2	98	6/10	26	13.8
FourOsix	15	55	31	60.0	71	6/11	28	13.7
WB4739AX	---	---	30	61.3	86	6/10	27	14.0
LCS Jet	12	50	29	57.8	77	6/11	25	13.6
Irv (W)	9	42	28	59.8	91	6/11	27	13.7
OR2190160R	---	---	28	59.7	98	6/11	26	13.9
Scorpio	10	34	27	59.0	60	6/13	28	13.3
OR2190064R	---	---	27	60.2	96	6/14	23	13.5
UT11426-2 (W)	---	---	27	59.7	76	6/16	42	15.1
WB4733CLP	---	---	27	61.3	80	6/11	24	14.6
Juniper	17	46	27	61.5	85	6/13	36	13.8
Promontory	14	42	27	61.2	83	6/16	36	15.2
WB4445CLP	---	---	27	61.1	78	6/7	27	14.6
DBDH18-36	---	---	26	57.3	86	6/8	26	12.7
Keldin	16	49	25	60.6	73	6/13	30	14.5
DBDH18-17	---	---	23	59.1	86	6/13	27	13.4
Average	13	44	31	60.2	85	6/13	30	13.5
LSD ($\alpha=0.05$)	4	9	9	1	26	3	3	---
CV (%)	23.4	13.4	19.5	1.1	22	1.3	6.0	---

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

** 2023 trial was not harvested due to snow mold damage.

(W) = Hard White Winter

No lodging to report.

Table 13. Agronomic Data for Hard Winter Wheat at Ririe, Dryland, 2024.

Variety or Selection	Yield (bu/A)**			Test Wt. (lb/bu)	Heading Date	Height (in.)	Protein (%)
	2021	2023	2024*				
UI Silver (W)	18	37	39	60.8	6/11	28	9.8
WA8398	---	---	37	54.6	6/11	23	9.6
WB4445CLP	---	---	34	59.6	6/5	23	11.5
WA8401	---	---	33	57.7	6/12	23	9.0
Irv (W)	16	34	33	60.1	6/8	22	9.4
WA8399	---	---	33	58.0	6/12	22	8.2
Keldin	17	42	32	59.1	6/9	25	9.2
Millie (W)	15	37	32	60.3	6/9	21	10.4
LCS Missile	---	---	32	57.8	6/10	23	10.3
Apst-132	---	---	31	56.3	6/12	21	9.5
DBDH18-36	---	---	31	55.7	6/5	22	9.7
OR2190160R	---	---	31	58.6	6/9	20	10.1
UT11227-4 (W)	---	---	31	61.3	6/12	32	10.9
WB4739AX	---	---	31	59.7	6/9	22	8.9
DBDH18-17	---	---	31	56.3	6/9	23	9.1
Sequoia	17	38	31	58.0	6/11	29	8.8
Scorpio	16	35	31	58.1	6/11	23	9.4
UT11417-6 (W)	---	---	30	---	6/10	27	10.2
Yellowstone	18	44	30	58.1	6/9	26	9.4
WB4733CLP	---	---	30	59.6	6/9	19	10.4
UI SRG	18	37	30	59.0	6/10	27	8.4
Utah-100	17	36	30	59.0	6/11	28	10.0
Juniper	17	39	29	58.7	6/11	31	9.7
FourOsix	17	45	29	58.5	6/9	24	10.0
UT11319-9 (W)	---	---	29	60.2	6/10	27	11.2
Curlew	---	---	29	58.6	6/10	28	12.4
OR2190165R	---	---	29	59.4	6/9	22	9.8
Flathead	15	40	27	60.5	6/5	26	9.7
LCS Jet	16	38	27	55.8	6/9	20	9.9
Milestone	---	---	27	56.6	6/9	23	10.1
MT1745	20	44	27	58.8	6/10	24	10.3
Keldin + 11-52-0	18	46	27	59.1	6/9	25	9.8
Artek	---	---	26	57.3	6/7	21	10
Golden Spike (W)	15	36	26	58.4	6/11	27	9.5
OR2190064R	14	35	26	58.0	6/11	22	10.9
Promontory	17	37	26	60.6	6/11	31	11
WB4510CLP	17	42	25	60.9	6/8	25	9.8
UT11426-2 (W)	---	---	24	---	6/11	32	10.5
NuMont	---	---	24	58.5	6/10	26	0
Average	16	38	30	58.7	6/9	25	9.7
LSD ($\alpha=.05$)	3	6	9	1	1.2	2	---
CV (%)	12.8	11.3	21.8	1.3	0.5	7.1	---

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

** 2022 data wasn't harvested due to weather damage (high spring winds).

(W) = White

No lodging to report.

All plots had full stand.

Table 14. Agronomic Data for Hard Winter Wheat at Soda Springs, Dryland, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
WA8398	---	---	32	57.8	89	7/2	21	10.9
Milestone	---	31	30	58.4	80	7/1	21	12.9
FourOsix	47	39	29	58.7	85	6/30	21	12.6
Yellowstone	46	43	27	60.4	95	6/30	23	12.6
UT11227-4 (W)	---	---	27	60.0	89	7/2	32	10.0
Sequoia	53	38	27	58.9	80	7/2	28	9.1
UT11426-2 (W)	---	---	26	59.9	88	6/30	30	12.2
Keldin	50	28	26	59.3	76	7/1	23	13.9
Utah-100	---	23	25	59.8	95	6/30	26	10.8
LCS Jet	55	29	25	59.1	68	7/2	20	12.6
UI Silver (W)	50	32	25	60.4	89	6/6	25	12.7
Keldin + 11-52-0	52	27	24	58.9	74	7/1	23	13.2
LCS Missile	---	---	24	55.6	76	7/2	20	11.7
Millie (W)	44	35	23	58.5	66	7/2	21	12.7
MT1745	40	38	22	59.4	68	7/1	22	12.5
NuMont	---	---	22	59.2	74	6/30	23	---
Irv (W)	40	16	21	58.5	55	7/2	23	12.3
Artek	---	---	21	55.8	76	7/1	19	13.1
WA8401	---	---	21	56.0	91	7/1	23	9.9
Apst-132	---	---	20	60.1	88	7/2	18	11.8
UI SRG	51	29	20	60.0	86	6/30	23	14.1
Scorpio	43	35	20	59.1	89	7/2	18	11.1
WB4739AX	---	---	20	58.1	84	6/30	22	14.3
Golden Spike (W)	44	39	20	56.9	54	7/1	27	12.5
OR2190064R	---	21	19	55.6	71	7/2	19	11.2
WA8399	---	---	18	54.2	90	7/1	21	9.9
UT11417-6 (W)	---	---	18	60.9	75	7/1	26	11.5
Juniper	44	27	17	59.4	75	7/1	26	12.5
WB4445CLP	---	---	17	60.3	98	6/30	20	16.1
OR2190160R	---	---	17	58.0	61	7/2	19	12.4
UT11319-9 (W)	---	---	17	59.5	65	7/1	24	14.1
WB4733CLP	---	---	16	59.6	61	6/30	21	14.6
OR2190165R	---	---	16	56.8	73	7/1	21	13.2
WB4510CLP	48	27	15	62.0	78	6/30	22	11.3
Curlew	---	---	15	57.9	63	7/1	26	12.6
Promontory	49	32	15	59.5	65	7/1	24	12.6
Flathead	44	32	14	59.7	98	6/30	20	12.2
DBDH18-17	---	---	13	56.5	76	7/1	23	12.8
DBDH18-36	---	---	9	57.3	61	7/1	18	13.0
Average	46	31	21	58.6	77	6/30	23	12.4
LSD ($\alpha=0.05$)	10	8	11	2	30	12	3	---
CV (%)	13.6	19.8	37.1	2.4	27.7	4.5	9.4	---

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

(W) = Hard White Winter

No lodging to report.

Table 15. Hard Winter Wheat Yield Percentage of Location Averages, 2024.

Variety or Selection	Aberdeen	Kimberly	Rupert	Ririe Irrigated	Ririe Dryland	Rockland	Soda Springs	Variety Average
UI Silver (W)	---	---	---	---	130	125	118	124
WA8398	105	103	122	91	125	118	155	117
UT11227-4 (W)	---	---	---	---	105	109	128	114
Utah-100	---	---	---	---	101	118	121	113
Sequoia	---	---	---	---	104	107	127	113
FourOsix	104	109	118	102	98	98	140	110
WA8401	108	108	124	97	111	122	98	110
HSG108	105	102	110	108	---	---	---	106
WA8399	100	109	128	95	111	115	86	106
UI SRG	---	---	---	---	101	121	97	106
LCS Jet	106	107	122	102	91	94	119	106
Milestone	97	97	96	111	90	---	143	106
WA8405	106	103	114	100	---	---	---	106
LCS Blackbird	96	111	114	102	---	---	---	106
LCS Missile	97	102	117	98	107	99	113	105
HSG110	109	101	100	108	---	---	---	104
Keldin	103	102	111	101	108	79	122	104
HSG124	114	105	95	101	---	---	---	104
Apst-132	109	108	93	106	106	---	97	103
Yellowstone	103	107	104	104	102	102	131	103
UT11307-3	98	102	115	96	---	---	---	103
HSG132	106	102	93	110	---	---	---	103
WB4401	98	99	110	103	---	---	---	102
Millie (W)	105	91	91	102	108	101	112	101
Irv (W)	---	---	---	---	111	91	101	101
Greenville	101	99	109	92	---	---	---	100
MT1745	102	93	104	96	90	109	107	100
WB4303	104	99	95	102	---	---	---	100
WB4640	109	101	86	103	---	---	---	100
UT11532-2	94	111	100	90	---	---	---	99
Scorpio	100	100	96	103	103	87	96	98
Keldin + 11-52-0	101	99	87	101	90	105	113	98
UT11426-2 (W)	---	---	---	---	82	87	124	97
Golden Spike (W)	---	---	---	---	87	111	94	97
WB4739AX	97	94	89	100	105	97	96	97
UT11412-2 (W)	91	95	102	98	---	---	---	97
UT11408-8	100	103	82	99	---	---	---	96
UT11319-9 (W)	---	---	---	---	98	109	79	95
Balance	90	92	104	95	---	---	---	95
UT11417-6 (W)	---	---	---	---	102	99	84	95
Kairos	102	98	86	95	---	---	---	95
Flathead	93	98	116	90	92	101	69	94
WB4445CLP	---	---	---	---	113	85	82	93
OR2190165R	98	96	77	105	96	99	77	93
OR2190064R	93	95	92	104	87	87	90	92
NuMont	---	---	---	---	80	---	104	92
Curlew	---	---	---	---	96	111	70	92
WB4422	99	95	77	95	---	---	---	91
OR2190160R	97	98	67	103	105	89	80	91
WB4510CLP	---	---	---	---	84	111	72	89
Juniper	---	---	---	---	99	86	82	89
WB4733CLP	---	---	---	---	101	87	78	89
Artek	98	93	47	98	89	---	98	87
DBDH18-36	85	81	111	96	106	84	44	87
DBDH18-17	77	87	89	89	104	74	61	83
Promontory	---	---	---	---	86	85	70	80
(bu/A)	154	172	71	166	30	31	21	

(W) = White

Chart 2. 2024 Hard Winter Wheat Yield Percentage Across All Locations

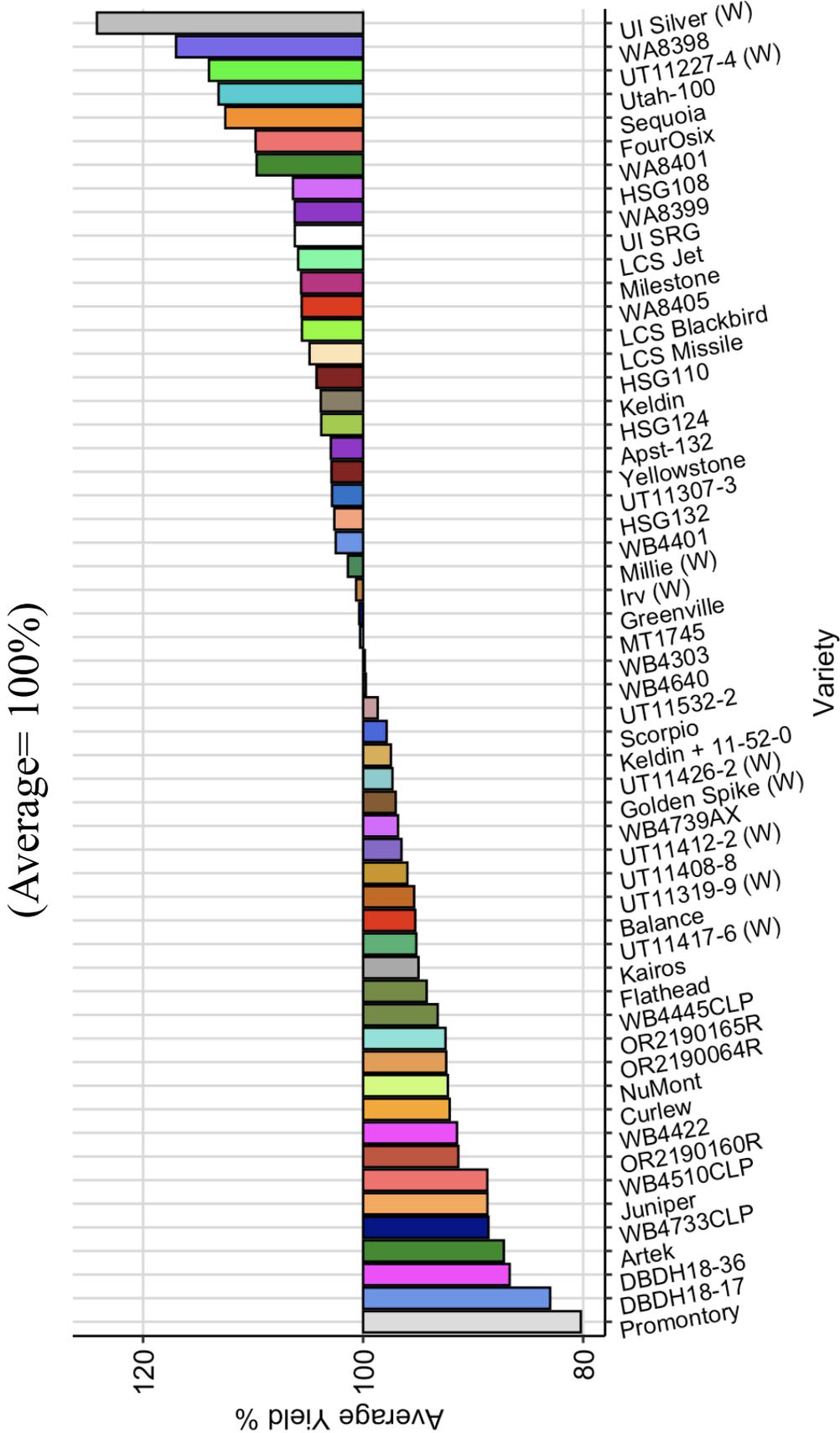


Table 16. Soft White Winter Wheat Irrigated Nurseries, 3-Year Averages (2022-2024; 11 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
AP Exceed	151	58.1	99	6/5	36	0	10.3
LCS Hulk	151	58.2	99	6/7	38	0	11.0
LCS Blackjack	150	56.4	98	6/7	37	0	11.3
SY Ovation	148	58.1	98	6/7	38	0	11.0
WB1621	147	59.3	98	6/7	37	0	10.3
VI Gem	147	58.5	98	6/6	37	2	11.1
WB1783	147	59.9	99	6/8	37	0	10.6
IDO1708	143	55.8	99	6/8	38	0	10.9
Perrine	143	56.2	98	6/10	39	0	11.1
VI Shock	142	57.1	96	6/7	38	1	11.0
UI Sparrow	141	57.3	96	6/11	41	1	10.0
Norwest Tandem	141	56.9	99	6/6	34	0	10.7
Nimbus	139	56.9	97	6/6	40	2	11.1
WB1529	138	59.3	97	6/7	35	0	10.7
OR2160243	137	56.7	97	6/7	36	0	10.5
SY Assure	137	57.7	97	6/3	34	0	10.8
VI Presto CL+	137	56.7	99	6/8	40	0	10.4
Stephens	135	58.6	97	6/6	37	0	10.9
WB 456	134	59.2	97	6/5	37	0	11.8
UI Magic CL+	131	56.0	94	6/6	35	0	11.2
OR2170559	128	56.2	99	6/7	35	0	11.0
Average	141	57.5	98	6/7	37	0.3	10.8
LSD ($\alpha=.05$)	7	1	3	0.7	1	1	1
CV (%)	11.4	2.7	7.2	1.1	4.8	1282	6.2

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

Table 17. Soft White Winter Wheat Dryland, 3-Year Averages (2022-2024; 7 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Stand (%)	Heading Date	Height (in.)	Protein (%)
Sockeye CL+	41	55.0	96	6/22	28	11.1
Piranha CL+	40	55.6	92	6/23	27	11.3
SY Ovation	38	55.6	90	6/21	25	11.5
Otto	38	55.6	94	6/24	27	11.7
Norwest Tandem	38	54.9	95	6/19	23	11.6
Eltan 11-52-0	37	56.1	93	6/24	26	11.1
Devote	36	57.0	95	6/24	24	11.0
UI Sparrow	36	55.4	95	6/24	27	10.8
Norwest Duet	35	55.4	93	6/23	28	11.0
Eltan	35	56.3	97	6/24	26	10.8
IDO1708	34	53.2	93	6/19	26	10.9
WB 456	33	55.8	94	6/19	24	11.7
UI Magic CL+	32	55.9	91	6/20	24	11.8
VI Presto CL+	32	56.6	97	6/20	25	11.4
Appleby CL+	30	55.3	86	6/20	24	11.5
Stephens	28	54.6	91	6/20	25	11.0
Average	35	55.5	93	6/22	25	11.3
LSD ($\alpha=.05$)	4	1	5	0.7	1	0.7
CV (%)	18.9	2.2	9.8	0.8	5.9	5.2

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

No lodging to report.

Table 18. Irrigated Soft White Winter Wheat Data Combined from Aberdeen, Kimberly, Ririe and Rupert, 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
LCS Blackjack	155	58.5	100	6/3	37	0	10.4
UIL 17-995133B	149	58.1	100	6/2	35	0	9.4
AP Exceed	147	59.7	100	6/1	37	0	9.6
UI Sparrow	146	59.1	99	6/6	40	2	10.7
LCS Jefe	145	58.6	100	6/3	37	0	9.6
LCS Hulk	145	59.1	100	6/3	38	0	10.5
LCS Shine	145	58.7	99	6/1	32	0	8.9
VI Shock	144	59.7	99	6/3	37	2	9.8
SY Ovation x 1.75	143	60.0	100	6/3	37	6	9.9
SY Ovation	143	60.6	99	6/3	37	0	10.2
SY Ovation x 1.25	142	60.4	100	6/2	37	0	10.1
UIL17-550099A	141	60.2	100	6/5	37	0	10.9
VI Gem	141	59.6	100	6/2	37	0	9.5
AP Olympia	141	59.9	100	6/2	36	0	10.6
UIL 14-211120A	140	58.7	99	6/2	39	0	9.8
IDO1708	140	58.6	100	6/1	36	0	10.0
UIL16-007057A	139	58.9	100	6/2	39	0	10.6
SY Ovation x 1.50	139	61.3	100	6/3	37	0	9.8
SY Ovation / WB1529	138	60.2	100	6/2	37	0	10.1
WB1545	138	59.4	100	5/30	37	0	10.6
SY Ovation x 0.75	137	59.9	100	6/3	36	3	9.9
OR2160243	136	58.7	100	6/2	37	0	9.8
Norwest Tandem	136	59.5	100	6/2	34	0	10.0
VI Presto CL+	136	59.6	100	6/3	39	0	10.9
WB1783	135	59.3	100	6/2	37	0	10.6
WB1621	135	59.4	100	6/1	36	0	9.6
WA8398	135	59.2	100	6/4	36	0	10.4
LCS Drive	135	60.4	100	6/1	31	0	10.3
WA8404	133	59.6	100	6/3	36	0	10.4
Stephens	133	60.1	100	6/1	37	0	10.5
Perrine	132	58.7	100	6/6	38	0	10.0
Nimbus	131	59.9	100	6/2	39	4	10.2
WA8397	129	58.8	100	6/4	35	0	10.2
WA8405	129	58.8	100	6/3	37	0	10.3
SY Assure	129	59.8	100	5/29	35	0	10.8
UI Magic CL+	128	59.2	100	6/1	34	0	10.7
WB 456	126	59.6	100	5/31	37	0	11.0
WB1529	126	58.9	100	6/1	35	0	10.4
OR2180377	123	60.1	99	6/4	34	0	9.5
OR2170559	120	59.2	99	6/3	34	0	10.5
Average	137	59.4	100	6/2	36	0.5	10.2
LSD ($\alpha=.05$)	12	0.7	1	1	1	4	0.8
CV (%)	12.6	1.6	0.9	0.7	5.4	1150	5.7

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

Table 19. Dryland Soft White Winter Wheat Data Combined from Ririe, Rockland and Soda Springs, 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
Rollie	35	56.1	94	6/24	25	10.5
Piranha CL+	35	56.5	96	6/20	25	10.6
VI Encore CL+	35	56.8	98	6/20	24	11.2
UI Vixen	34	56.0	99	6/20	24	10.7
Sockeye CL+	34	57.5	98	6/20	26	10.0
Otto	33	57.7	99	6/23	26	11.2
Norwest Tandem	33	57.8	97	6/18	22	11.4
WA8404	32	56.5	99	6/19	23	10.5
SY Ovation	32	56.8	98	6/17	24	11.4
UIL17-550099A	32	56.6	98	6/19	25	10.5
Nimbus	31	58.6	99	6/17	24	10.5
UIL16-478001A	31	56.5	96	6/18	25	10.8
UIL 14-211120A	31	56.3	99	6/17	24	10.3
Devote	31	56.9	97	6/21	24	10.2
WA8405	31	56.6	98	6/20	23	10.5
Eltan	31	57.5	98	6/22	24	10.5
UIL 17-995133B	30	56.5	98	6/17	23	10.2
UIL16-007057A	30	56.8	89	6/18	25	10.3
UI Sparrow	29	56.5	95	6/21	26	10.0
Eltan 11-52-0	28	58.5	98	6/22	25	10.3
UI Magic CL+	28	58.9	95	6/18	23	11.6
Norwest Duet	28	58.7	95	6/20	27	10.3
LCS Jefe	28	59.1	91	6/19	22	10.3
IDO1708	27	58.1	98	6/17	23	10.2
Appleby CL+	26	57.6	98	6/17	24	11.0
WB 456	26	56.5	97	6/16	23	11.8
WA8397	26	56.2	98	6/20	23	10.0
VI Presto CL+	24	56.1	99	6/19	23	11.1
LCS Shine	24	58.4	97	6/17	20	9.7
Stephens	23	56.0	98	6/17	23	10.3
ORI2190025CL+	21	57.0	96	6/18	22	10.6
Average	30	57.2	97	6/19	24	10.6
LSD ($\alpha=.05$)	5	1	7	1	1	1
CV (%)	21.7	1.8	8.2	0.6	5.9	5.3

* 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 Kimberly, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2022	2023	2024*					
LCS Blackjack	177	137	200	58.6	5/26	42	0	10.0
LCS Jefe	---	---	193	59.7	5/27	42	0	9.2
SY Ovation x 1.75	---	---	192	59.0	5/26	40	24	8.8
AP Exceed	168	156	191	60.2	5/24	42	0	8.8
SY Ovation x 1.25	---	---	191	58.9	5/26	42	0	8.8
LCS Hulk	176	161	190	60.8	5/28	42	0	10.3
UI Sparrow	166	139	190	58.4	5/31	44	9	10.4
SY Ovation x 0.75	---	---	189	59.0	5/27	39	13	8.5
SY Ovation	168	167	188	59.1	5/27	43	0	9.3
SY Ovation x 1.50	---	---	187	58.7	5/26	42	0	8.4
UIL14-211120A	---	143	184	58.9	5/26	43	0	8.7
VI Gem	174	145	184	60.1	5/25	40	0	8.7
WA8397	---	---	184	60.0	5/28	40	0	10.0
WA8405	---	---	183	59.5	5/28	40	0	9.1
IDO1708	182	130	180	59.2	5/24	39	0	9.4
WA8404	---	---	180	59.9	5/27	42	0	9.6
UIL17-995133B	---	150	180	60.4	5/26	38	0	9.0
OR2160243	179	105	179	59.4	5/26	41	0	9.3
LCS Shine	---	---	178	59.5	5/25	36	0	8.7
VI Presto CL+	160	126	178	60.3	5/28	42	0	10.9
WB1529	160	135	177	61.4	5/25	40	0.5	9.9
AP Olympia	---	---	177	60.2	5/25	40	0	9.6
Perinne	163	149	176	60.2	5/30	43	0	8.8
UIL16-007057A	---	---	176	59.7	5/25	41	0	9.8
WA8398	---	---	176	59.8	5/27	39	0	9.4
SY Ovation / WB1529	---	---	176	60.4	5/25	39	0	9.1
SY Assure	164	127	176	60.8	5/22	39	1	9.9
Norwest Tandem	166	141	176	60.4	5/26	38	0	9.9
VI Shock	169	133	176	59.7	5/27	39	0	9.1
UI Magic CL+	153	109	176	60.1	5/23	37	0	9.8
WB1783	170	149	175	61.7	5/25	39	0	10.2
LCS Drive	---	---	174	58.0	5/25	35	0	9.7
Stephens	164	132	173	58.8	5/24	40	0	9.8
OR2180377	---	---	173	57.7	5/28	38	1	9.2
WB1545	---	---	170	58.8	5/23	40	0	10.3
OR2170559	167	101	167	58.9	5/26	38	0	9.8
WB1621	171	144	166	61.1	5/25	38	0	9.5
Nimbus	---	140	165	59.1	5/26	43	18	9.8
UIL17-550099A	---	---	162	59.7	5/29	40	0	10.0
WB 456	152	130	155	61.1	5/24	40	0	9.7
Average	167	136	179	59.7	5/26	40	2	9.5
LSD ($\alpha=.05$)	14	16	18	1	2	3	15	---
CV (%)	5.8	8.2	7.4	1.6	1.0	5.5	647	---

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

** All plots had full stand.

Table 21. Agronomic Data for Soft White Winter Wheat at Rupert, Irrigated, 2024.

Variety or Selection	Yield (bu/A)**			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2021	2022	2024*						
OR2160243	157	109	101	57.8	100	155	35	0	9.9
WA8404	---	---	98	57.9	100	156	35	0	10.8
VI Shock	175	96	97	58.2	100	157	39	0	10.1
LCS Hulk	171	121	96	59.9	100	156	37	0	10.1
WB1621	---	120	95	59.2	100	155	38	0	8.6
UI Sparrow	154	115	94	57.9	100	159	41	0	10.4
LCS Jefe	---	---	94	58.0	100	157	35	0	9.9
UIL17-550099A	---	---	92	58.6	100	158	36	0	10.8
LCS Shine	---	---	92	57.4	100	155	32	0	9.0
Norwest Tandem	146	103	92	58.8	100	154	34	0	9.3
UIL17-995133B	---	---	90	58.8	100	154	32	1	8.3
UIL14-211120A	---	---	89	57.8	100	155	40	0	9.8
LCS Blackjack	162	118	89	57.3	100	156	36	0	11.4
IDO1708	148	107	88	57.4	100	154	37	0	10.4
Perrine	---	---	86	58.7	100	159	35	0	9.2
AP Exceed	172	129	84	58.2	100	155	37	0	10.2
WA8398	---	---	82	58.0	100	156	36	0	10.9
VI Gem	153	125	81	58.1	100	155	36	0	9.4
Stephens	151	96	81	57.1	100	155	37	0	10.3
Nimbus	---	---	80	58.2	100	155	38	0	9.7
WB1783	153	129	80	61.2	100	157	36	0	11.2
LCS Drive	---	---	77	56.2	100	154	29	0	10.9
AP Olympia	---	---	76	58.6	100	156	34	1	10.9
SY Ovation x 1.25	---	---	75	57.7	100	156	35	0	9.6
UIL16-007057A	---	---	75	58.3	100	156	39	0	10.2
SY Ovation	160	128	75	58.3	99	156	35	0	10.5
WB1545	---	---	74	59.2	100	152	37	0	10.8
WA8405	---	---	73	57.7	100	157	36	0	10.6
SY Ovation x 1.50	---	---	73	58.0	100	156	36	0	9.2
VI Presto CL+	159	90	73	59.5	100	157	40	8	11.2
SY Ovation / WB1529	---	---	71	58.7	100	157	38	0	10.7
SY Ovation x 0.75	---	---	71	57.6	100	157	35	0	9.2
OR2180377	---	112	70	56.8	100	157	33	0	9.2
WA8397	---	---	69	57.8	100	157	33	0	10.6
SY Ovation x 1.75	---	---	67	57.8	100	156	35	0	8.6
OR2170559	---	114	64	56.8	100	155	35	0	10.3
UI Magic CL+	155	115	61	58.2	100	155	32	0	10.9
WB 456	148	129	61	59.1	100	154	36	0	11.7
WB1529	148	127	58	58.7	100	154	35	0	10.9
SY Assure	155	143	56	55.1	100	151	32	0	10.7
Average	155	117	80	58.1	100	156	36	0.3	10.2
LSD ($\alpha=.05$)	15	21	25	0.9	2	2	3	3	---
CV (%)	7.0	11.8	22.7	1.1	0.4	0.7	5.6	966	---

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

** 2023 trials were damaged due to frost.

Yields were damaged due to June 18, 19 frost events.

Table 22. Agronomic Data for Soft White Winter Wheat at Aberdeen, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
UIL17-995133B	---	156	152	61.2	100	6/2	35	10.0
SY Ovation x 1.75	---	---	151	60.4	100	6/3	35	10.9
VI Shock	174	159	148	60.5	98	6/3	35	9.3
UIL16-007057A	---	---	147	60.0	100	6/2	37	10.2
UIL17-550099A	---	---	145	59.6	100	6/5	35	10.8
LCS Blackjack	179	150	144	58.7	100	6/4	35	9.0
SY Ovation x 1.25	---	---	144	60.3	99	6/3	36	10.8
SY Ovation x 1.50	---	---	143	60.1	100	6/3	35	10.6
AP Olympia	---	---	143	60.8	99	6/3	34	10.1
UI Sparrow	151	137	142	58.7	98	6/6	38	10.5
SY Ovation	155	159	139	60.1	98	6/3	35	9.9
LCS Hulk	165	164	137	60.8	99	6/4	37	9.6
VI Presto CL+	154	152	137	61.1	98	6/2	37	10.2
AP Exceed	162	160	137	61.0	100	6/1	33	9.1
VI Gem	168	156	135	60.7	99	6/2	35	8.9
LCS Jefe	---	---	134	59.8	99	6/4	35	8.5
WB1545	---	---	134	61.9	100	5/31	35	10.1
IDO1708	152	143	133	59.7	100	6/2	35	9.3
SY Ovation / WB1529	---	---	132	60.2	100	6/2	35	9.7
WB1783	179	147	131	61.9	100	6/2	36	10.3
WB 456	150	129	131	61.7	100	6/1	36	10.4
LCS Shine	---	---	130	59.8	98	6/1	30	7.6
SY Ovation x 0.75	---	---	129	59.8	100	6/3	36	10.6
WA8398	---	---	127	59.1	99	6/5	34	9.5
Stephens	156	148	127	59.2	100	6/1	35	10.4
SY Assure	165	119	125	61.4	100	5/30	33	10.6
UI Magic CL+	164	135	125	60.7	100	6/1	32	10.6
LCS Drive	---	---	124	58.5	99	6/2	30	9.1
UIL14-211120A	---	164	121	58.8	100	6/3	36	9.7
Nimbus	---	147	120	60.1	100	6/2	37	10.0
WB1621	185	160	120	61.8	100	6/1	34	9.7
Norwest Tandem	162	151	119	60.1	99	6/2	32	9.4
Perrine	170	153	117	59.7	99	6/5	35	9.8
WA8397	---	---	115	57.8	100	6/5	32	8.2
WA8405	---	---	112	57.5	99	6/4	34	10
WA8404	---	---	105	58.8	100	6/4	32	9.2
OR2160243	155	138	103	59.2	100	6/3	34	9.0
WB1529	164	153	99	61.3	100	6/1	33	9.2
OR2170559	162	116	96	58.0	98	6/3	30	9.7
OR2180377	---	---	94	57.4	98	6/4	31	8.3
Average	162	144	129	59.9	99	6/3	34	9.7
LSD ($\alpha=.05$)	22	23	34	1	2	1	3	---
CV (%)	9.4	11.6	19.0	1.2	1.4	0.6	6.0	---

* Varieties or selections in bold are not statistically different from the top yielding variety. No lodging to report.

Table 23. Agronomic Data for Soft White Winter Wheat at Ririe, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
LCS Blackjack	154	111	188	58.9	100	6/9	36	11.3
LCS Shine	---	---	179	60.5	100	6/9	32	10.2
AP Exceed	166	139	178	60.9	100	6/8	35	10.4
UIL17-995133B	---	127	175	61.0	100	6/9	34	10.1
SY Ovation / WB1529	---	---	173	60.9	100	6/9	37	10.9
WB1545	---	---	173	62.7	100	6/6	35	11.2
WB1529	161	115	170	62.3	100	6/9	32	11.4
AP Olympia	---	---	169	60.3	100	6/9	36	11.7
SY Ovation	151	128	168	61.0	100	6/10	37	10.9
UIL14-211120A	---	107	168	59.0	96	6/9	38	11.0
UIL17-550099A	---	---	165	58.6	100	6/10	37	11.8
LCS Drive	---	---	165	59.2	100	6/8	30	11.5
VI Gem	168	122	164	59.3	100	6/8	36	10.9
OR2160243	147	131	162	59.8	100	6/9	36	11.0
SY Ovation x 1.75	---	---	162	61.0	100	6/9	37	11.2
UI Sparrow	162	98	161	58.7	100	6/13	39	11.4
LCS Jefe	---	---	160	59.1	100	6/9	35	10.6
Nimbus	---	116	160	60.8	100	6/9	39	11.2
UIL16-007057A	---	---	160	62.9	100	6/9	38	10.5
WB1621	167	134	160	59.6	100	6/9	36	12.1
SY Assure	160	112	159	58.9	100	6/5	35	12.1
WB 456	171	106	159	61.7	100	6/7	38	12.1
SY Ovation x 0.75	---	---	158	60.3	100	6/9	36	11.1
SY Ovation x 1.25	---	---	158	60.5	100	6/9	36	11.2
LCS Hulk	171	132	157	60.5	100	6/9	36	11.9
IDO1708	161	129	157	60.0	100	6/8	36	11.2
Norwest Tandem	165	121	157	59.3	100	6/9	34	11.0
OR2180377	---	---	156	57.6	100	6/12	34	11.1
VI Shock	145	113	156	59.4	100	6/9	36	10.6
VI Presto CL+	152	113	156	61.8	100	6/9	38	11.3
OR2170559	149	129	155	62.3	100	6/9	34	10.7
WB1783	168	130	155	59.1	100	6/9	37	12.0
SY Ovation x 1.50	---	---	155	60.2	100	6/10	36	11.1
WA8398	---	---	154	59.1	100	6/10	36	11.7
Stephens	140	115	150	60.1	100	6/9	36	11.3
UI Magic CL+	136	116	150	60.7	100	6/8	34	11.5
WA8404	---	---	150	58.2	100	6/9	35	12.0
WA8397	---	---	149	58.2	100	6/11	36	11.8
Perrine	164	120	149	58.3	100	6/13	38	12.0
WA8405	---	---	148	58.6	100	6/9	36	11.6
Average	155	117	161	60.0	100	6/9	36	11.3
LSD ($\alpha=.05$)	15	31	14	1	2	1	2	---
CV (%)	6.7	18.8	6.1	1.2	1.2	0.6	4.2	---

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

No lodging to report.

Table 24. Agronomic Data for Soft White Winter Wheat at Rockland, Dryland, 2024.

Variety or Selection	Yield (bu/A)**			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2021	2022	2024*					
WA8404	---	---	44	56.0	100	6/15	27	11.1
Sockeye CL+	15	45	43	57.9	99	6/17	31	11.3
UIL14-211120A	---	---	43	56.9	98	6/11	29	11.4
UIL17-995133B	---	---	42	59.6	93	6/11	28	10.9
WA8405	---	---	42	54.8	95	6/17	28	11.7
Piranha CL+	14	46	41	57.9	95	6/18	29	11.7
UIL17-550099A	---	---	41	57.6	94	6/14	28	12.0
Nimbus	---	---	41	58.5	100	6/12	28	11.3
UIL16-478001A	---	---	41	58.3	93	6/13	28	12.1
VI Encore CL+	---	---	40	57.5	99	6/16	26	11.7
Eltan	11	41	39	59.0	99	6/19	29	12.0
UI Sparrow	10	41	39	57.5	89	6/17	31	11.7
Norwest Tandem	---	45	39	58.2	98	6/13	24	11.7
IDO1708	---	33	38	56.8	94	6/11	27	10.7
SY Ovation	16	51	38	59.1	95	6/11	28	12.2
Norwest Duet	14	45	37	58.3	90	6/18	31	11.2
Rollie	---	---	37	59.1	96	6/19	27	11.5
VI Vixen	---	---	37	57.8	90	6/13	30	11.9
UIL16-007057A	---	---	37	60.5	98	6/18	28	11.3
UI Magic CL+	10	41	36	59.1	97	6/12	26	12.6
LCS Jefe	---	---	36	57.9	100	6/13	26	11.3
Otto	11	43	36	57.5	98	6/19	30	12.4
WA8397	---	---	36	55.0	95	6/16	27	11.6
Devote	---	---	35	60.0	94	6/18	27	11.9
Eltan 11-52-0	11	55	34	59.3	99	6/18	29	12.3
WB 456	12	38	34	58.9	92	6/10	27	13.2
VI Presto CL+	---	---	33	60.1	97	6/14	27	12.3
LCS Shine	---	---	32	57.9	97	6/11	24	10.3
Appleby CL+	---	43	32	58.4	97	6/12	28	12.3
Stephens	12	35	32	58.2	98	6/11	27	12.2
ORI2190025CL+	---	29	32	57.4	98	6/11	26	11.4
Average	12	43	37	58.1	96	6/14	28	11.7
LSD ($\alpha=.05$)	3	8	9	1	9	2	2	---
CV (%)	17.3	12.3	15.5	1.2	6.1	0.9	4.5	---

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

** 2023 trial was not harvested due to snow mold damage.

No lodging to report.

Table 25. Agronomic Data for Soft White Winter Wheat at Ririe, Dryland, 2024.

Variety or Selection	Yield (bu/A)**			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2021	2023	2024*					
Piranha CL+	19	38	36	56.8	100	6/11	25	9.8
Otto	18	40	35	57.9	99	6/15	24	9.7
Rollie	---	---	35	58.8	100	6/15	24	9.5
Sockeye CL+	18	39	34	56.6	100	6/11	26	9.0
WB 456	15	37	34	56.4	100	6/9	25	9.7
VI Encore CL+	14	33	34	56.3	100	6/11	25	10.9
UIL17-550099A	---	---	32	56.0	100	6/10	25	8.5
UIL14-211120A	---	34	31	55.8	100	6/11	24	9.1
Nimbus	---	38	31	56.4	100	6/9	23	9.8
Norwest Tandem	---	36	31	57.2	100	6/10	21	11.0
UIL16-007057A	---	---	31	55.4	100	6/9	25	8.3
Norwest Duet	16	33	31	57.1	100	6/12	27	9.3
Eltan	19	37	30	56.4	100	6/14	24	9.5
UIL16-478001A	---	---	30	57.2	100	6/11	25	9.4
Perrine	---	---	30	56.0	100	6/12	24	9.5
Devote	17	39	30	59.0	100	6/12	24	8.4
VI Vixen	---	---	30	58.7	100	6/12	23	9.0
UI Sparrow	18	35	30	57.6	100	6/13	25	8.8
SY Ovation	17	34	29	57.0	100	6/11	24	10.6
UIL17-995133B	---	35	29	56.4	100	6/9	23	8.2
WA8404	---	---	29	54.6	100	6/11	24	9.3
LCS Jefe	---	---	28	56.5	100	6/11	22	9.0
WA8405	---	---	28	54.2	100	6/12	23	8.7
UI Magic CL+	17	35	28	56.5	100	6/9	22	10.0
Eltan 11-52-0	19	38	28	54.8	100	6/14	23	8.5
IDO1708	15	33	28	57.0	100	6/9	23	8.5
VI Presto CL+	19	32	27	57.7	100	6/10	24	9.5
LCS Shine	---	---	26	53.9	100	6/10	20	8.6
Stephens	13	29	24	55.5	100	6/9	22	8.3
SY Assure	16	35	24	---	100	6/12	22	---
Appleby CL+	---	29	24	57.3	100	6/9	22	9.3
WA8397	---	---	19	54.8	100	6/12	22	8.3
ORI2190025CL+	---	---	18	56.4	100	6/9	21	9.7
Average	16	35	29	56.5	100	6/11	23	9.2
LSD ($\alpha=.05$)	3	6	8	0.9	1	1.1	2	---
CV (%)	11.9	12.6	19.6	1.1	0.4	0.5	5.8	---

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

** 2022 data wasn't harvested due to weather damage (high spring winds).

No lodging to report.

Table 26. Agronomic Data for Soft White Winter Wheat at Soda Springs, Dryland, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
VI Vixen	---	---	36	59.6	99	7/1	22	11.3
Rollie	---	---	34	57.9	86	7/6	23	10.5
VI Encore CL+	---	---	31	55.9	95	7/2	22	11.0
Norwest Tandem	42	43	30	56.3	93	7/1	21	11.4
SY Ovation	54	31	30	57.2	99	6/30	22	11.5
Devote	48	28	29	59.8	96	7/2	22	10.2
Otto	49	34	29	58.9	100	7/4	23	11.4
Sockeye CL+	59	40	27	57.4	96	7/1	23	9.6
Piranha CL+	52	41	27	58.5	93	7/1	23	10.2
WA8404	---	---	26	54.7	96	7/1	19	11.1
WA8405	---	---	26	54.0	98	7/1	19	11.0
UIL17-550099A	---	---	25	57.1	100	7/1	22	10.9
Nimbus	---	31	23	56.8	99	6/29	20	10.5
Appleby CL+	44	10	23	56.8	98	6/30	21	11.4
Eltan 11-52-0	46	33	23	59.3	96	7/5	22	10.2
UIL16-478001A	---	---	23	56.3	95	7/1	23	10.9
Eltan	40	35	22	59.1	94	7/4	21	10.0
UIL16-007057A	---	---	22	56.1	76	7/1	20	11.3
UIL17-995133B	---	34	22	57.5	99	6/30	19	11.4
WA8397	---	---	22	53.8	100	7/2	20	10.0
UI Magic CL+	45	24	21	57.4	89	7/1	21	12.1
UI Sparrow	52	36	21	56.6	94	7/2	24	9.5
LCS Jefe	---	---	20	57.1	76	7/2	20	10.5
SY Assure	46	12	20	57.9	86	7/2	21	11.5
Perrine	---	45	20	56.6	96	7/1	21	10.2
UIL14-211120A	---	39	20	55.9	99	6/30	20	10.4
Norwest Duet	55	32	18	57.8	95	7/1	23	10.4
IDO1708	53	19	18	55.5	98	7/1	21	11.5
ORI2190025CL+	---	---	17	57.0	90	7/1	20	10.7
VI Presto CL+	43	31	15	56.8	100	6/30	20	11.4
LCS Shine	---	---	14	55.9	94	7/1	18	10.1
Stephens	42	24	14	56.5	96	6/30	20	10.5
WB 456	48	23	12	56.5	99	6/29	18	12.5
Average	48	28	23	57.0	94	7/1	21	10.8
LSD ($\alpha=0.05$)	12	11	10	1	17	1	2	---
CV (%)	17.3	27.0	31.9	1.3	12.9	0.6	8.0	---

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

No lodging to report.

Table 27. Soft White Winter Wheat Yield Percentage of Location Averages, 2024.

Variety or Selection	(100% = Average)							Variety
	Aberdeen	Kimberly	Rupert	Ririe Irrigated	Ririe Dry	Rockland	Soda Springs	Average
Rollie	---	---	---	---	118	100	148	122
UIL 17-7706 CL+	---	---	---	---	115	108	136	120
UIL15-028024 A	---	---	---	---	103	99	156	119
Sockeye CL+	---	---	---	---	117	116	116	116
Piranha CL+	---	---	---	---	124	109	115	116
Otto	---	---	---	---	119	95	126	114
LCS Blackjack	112	112	111	117	---	---	---	113
Devote	---	---	---	---	103	94	126	108
VI Shock	115	98	121	97	---	---	---	108
LCS Hulk	107	106	120	98	---	---	---	108
AP Exceed	106	107	105	111	---	---	---	107
UIL 17-995133B	118	100	113	109	100	112	95	107
UIL17-550099A	113	90	116	102	109	109	107	107
SY Ovation	108	105	93	104	100	101	130	106
Norwest Tandem	92	98	115	97	106	103	130	106
UI Sparrow	110	106	118	100	101	103	91	104
WA8404	81	101	122	93	100	117	114	104
UIL16-478001A	---	---	---	---	104	108	99	104
UIL13-046145A	105	103	102	102	---	---	---	103
UIL 14-211120A	94	103	112	104	107	113	86	103
SY Ovation x 1.25	112	107	94	98	---	---	---	103
AP Olympia	111	99	95	105	---	---	---	102
SY Ovation x 1.75	117	107	83	100	---	---	---	102
OR2160243	80	100	127	100	---	---	---	102
Eltan	---	---	---	---	104	103	97	101
LCS Jefe	104	108	117	99	96	96	88	101
WB1621	93	93	119	99	---	---	---	101
UIL16-007057A	114	98	94	99	106	99	96	101
SY Ovation x 1.50	111	104	91	96	---	---	---	101
Nimbus	94	92	100	99	106	108	100	100
WB1545	104	95	92	107	---	---	---	100
SY Ovation / WB1529	102	98	89	108	---	---	---	99
WA8405	87	102	91	92	96	112	112	99
WB1783	102	98	100	96	---	---	---	99
WA8398	99	98	103	96	---	---	---	99
SY Ovation x 0.75	101	105	88	98	---	---	---	98
IDO1708	104	101	110	97	94	101	78	98
LCS Drive	96	97	97	102	---	---	---	98
Perrine	91	99	108	92	104	84	88	95
LCS Shine	101	99	115	111	90	86	62	95
Eltan 11-52-0	---	---	---	---	94	91	99	95
Norwest Duet	---	---	---	---	105	100	79	95
UI Magic CL+	97	98	76	93	95	97	91	93
VI Presto CL+	106	99	91	97	94	87	66	91
Appleby CL+	---	---	---	---	81	---	99	90
WA8397	90	103	86	93	66	95	95	90
SY Assure	97	98	69	99	82	---	88	89
WB 456	102	86	76	99	117	90	52	89
OR2180377	73	97	87	97	---	---	---	88
WB1529	77	99	73	105	---	---	---	88
Stephens	99	97	101	93	83	84	60	88
OR2170559	75	93	80	96	---	---	---	86
ORI2190025CL+	---	---	---	---	61	85	72	72
Location Average (bu/A)	129	179	80	161	29	37	23	

Chart 3. 2024 Soft Winter Wheat Yield Percentages Across All Locations
(Average= 100%)

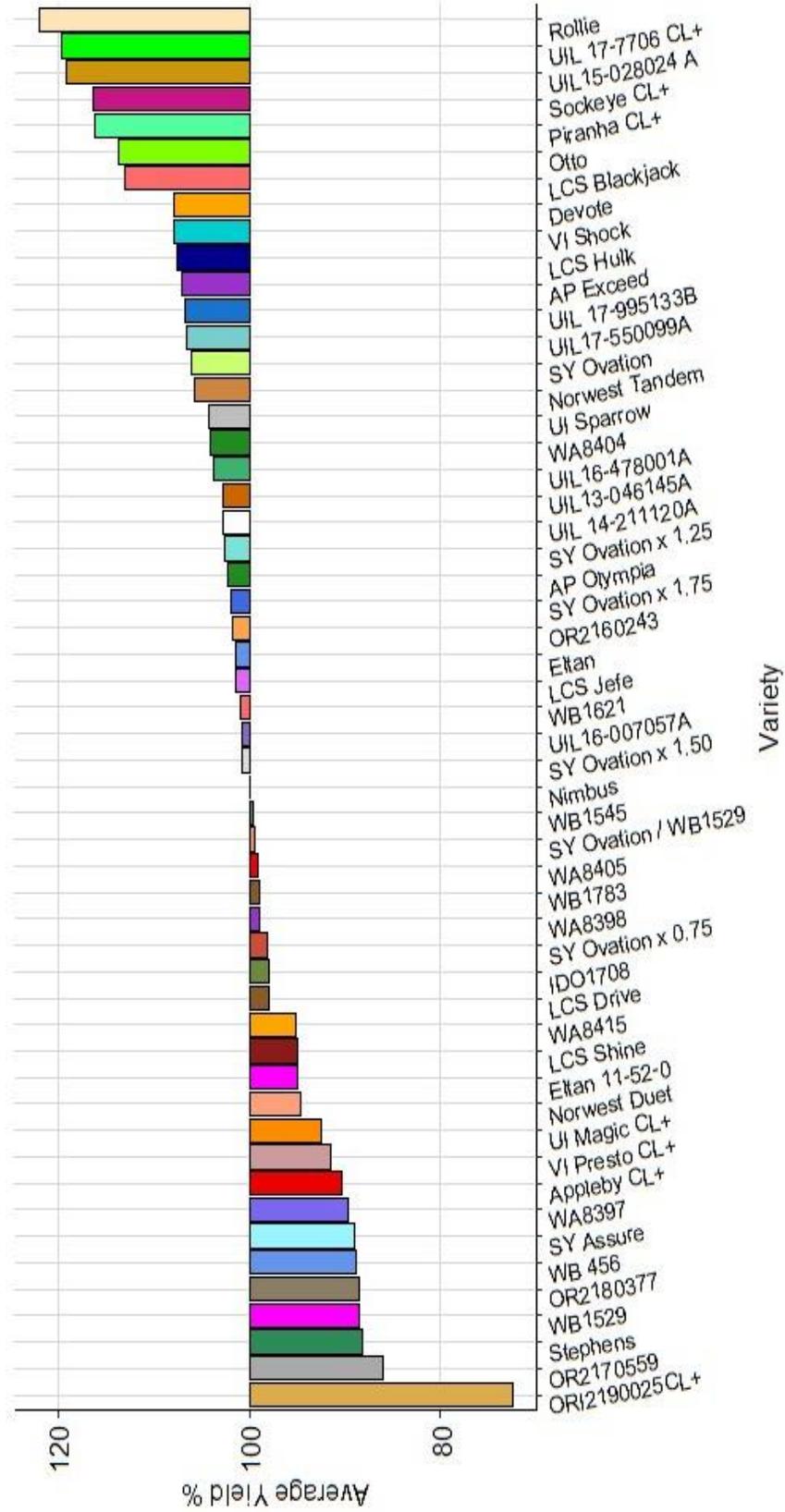


Table 28. Winter Barley Irrigated Nurseries, 3-Year Averages (2022-2024; 5 site-years*).

Variety or Selection	Yield (bu/A)**	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plumps		
								(>6/64)	(>5.5/64)	% thin
Clementine	143	50.3	95	5/26	36	0	12.7	90.3	6.4	3.5
13ARS537-19	131	52.7	90	5/24	34	6	12.1	91.8	4.7	3.6
KWS Donau	130	50.5	96	5/30	37	4	10.9	94.3	3.8	2.3
Fay	127	48.9	95	5/29	35	13	13.2	83.8	9.2	7.4
GN0-Vivar	127	49.1	94	5/29	39	4	13.9	90.2	5.4	4.8
Thunder	124	50.9	92	5/29	35	10	12.0	94.2	3.2	2.7
LCS Calypso	124	49.4	94	5/28	37	11	12.1	90.5	5.8	4.2
Flavia	124	50.3	93	5/28	32	4	11.5	90.6	6.6	3.1
Hirondella	121	47.4	88	5/30	36	5	11.2	87.8	7.9	4.6
Charles	117	49.7	91	5/28	37	25	11.4	87.7	6.9	5.5
WintMalt	115	49.9	93	6/1	36	3	12.9	88.5	7.0	4.5
Top Shelf	111	50.1	90	5/25	36	7	13.4	90.7	5.6	4.0
^a 12ARS777-2	106	54.7	85	6/1	38	3	15.7	72.6	15.2	12.4
Endeavor	103	50.1	83	5/31	39	13	12.7	86.0	8.4	6.2
^a 12ARS777-1	96	54.7	83	6/3	39	3	14.0	67.3	21.4	11.4
Marouetta	95	49.4	91	5/25	34	5	10.6	89.5	6.1	3.5
^a Upspring	89	58.8	62	6/3	36	0	13.7	70.4	21.0	8.5
Average	117	50.8	89	5/29	36	7	12.4	86.6	8.3	5.3
LSD ($\alpha=.05$)	14	1	6	1	2	8	1	9	5	4
CV (%)	18.3	4.3	10.3	0.9	8.1	191	7.2	8.2	50.9	62.1

* 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.

^aHulless food

Table 29. Irrigated Winter Barley Data Combined from Aberdeen and Rupert, 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plumps (>6/64)	Plumps (>5.5/64)	% thin
UT11604-2	125	49.9	99	5/24	34	0	9.7	86.1	8.6	6.5
13ARS526-8	112	50.4	100	5/24	32	0	9.9	85.6	8.6	6.0
UT11510-2	112	49.3	98	5/23	33	3	10.5	89.4	7.0	4.7
11ARS652-7	105	49.5	100	5/25	33	0	9.8	84.1	10.1	6.1
Hirondella	105	47.1	100	5/24	32	0	9.1	86.2	8.6	5.7
13ARS537-19	105	50.3	97	5/20	31	0	10.7	89.4	6.4	4.4
DH141947	99	46.6	99	5/22	30	0	10.5	87.3	7.7	5.4
Charles	99	50.3	98	5/21	33	0	12.3	84.2	9.1	6.6
UT10406-9	99	48.5	100	5/24	32	0	10.2	75.1	13.6	12.1
BC Clementine	96	50.1	100	5/21	31	0	9.7	85.9	6.0	7.8
GN0-Vivar	95	49.7	98	5/24	34	0	10.8	94.5	3.8	2.0
LCS Calypso	92	49.6	100	5/22	34	0	9.8	87.5	7.1	5.9
DH190077	92	49.9	99	5/21	30	0	10.6	91.0	5.7	4.1
KWS Donau	92	49.3	99	5/23	33	0	9.5	90.7	6.2	3.6
Endeavor	88	51.2	95	5/26	36	0	9.9	81.8	9.5	8.8
16ARS627-037	87	49.7	99	5/23	33	0	8.7	78.7	11.9	9.9
Memento	86	49.6	98	5/24	30	0	10.4	82.2	8.8	9.5
Flavia	85	48.2	100	5/23	28	0	9.7	86.6	9.1	4.6
DH171854	84	49.2	100	5/23	32	0	10.5	82.7	8.8	8.9
Marouetta	83	48.0	97	5/21	32	0	9.7	87.6	8.0	5.0
UTWB10201	83	47.0	99	5/23	28	0	9.2	67.4	19.7	13.7
Thunder	82	50.2	98	5/23	29	0	10.0	89.8	5.2	4.8
BC Fay	80	48.6	99	5/24	31	0	10.4	88.0	7.3	4.5
WintMalt	78	49.4	98	5/26	31	0	9.7	87.1	7.6	5.5
UT11135-1	76	47.6	97	5/24	27	0	9.3	76.2	14.3	10.4
Top Shelf	75	49.4	99	5/21	32	0	11.4	88.9	6.0	5.5
12ARS777-2	75	55.8	90	5/27	35	0	13.7	73.1	13.0	14.5
Avalon	71	51.5	97	5/22	35	0	10.6	88.0	6.7	5.1
12ARS777-1	62	57.8	81	5/30	34	0	12.5	74.2	16.1	10.3
Upspring	37	60.6	29	6/1	31	0	12.1	75.1	18.3	6.8
Average	89	50.1	95	5/24	32	0.1	10.3	84.1	9.3	6.9
LSD ($\alpha=.05$)	25	1	5	1	3	1	2	10	5	7
CV (%)	28.4	1.6	5.5	0.9	10.1	1549	8.8	5.7	27.1	47.9

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

(W) = White

Table 30. Agronomic Data for Winter Barley at Rupert, Irrigated, 2024.

Variety or Selection	2021	2022	2024*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	(>6/64)	Plump (>5.5/64)	% Thin
Hirondella	177	130	103	46.2	100	5/23	35	0	8.9	78.8	13.1	8.4
UT11604-2	---	---	100	48.6	100	5/23	34	0	8.8	77.2	12.9	11.5
13ARS526-8	---	---	98	48.2	100	5/23	32	0	8.9	73.0	15.6	11.1
UTWB10201	---	---	96	46.0	100	5/22	31	0	8.4	53.7	25.4	22.1
UT11510-2	---	---	95	48.3	100	5/22	34	5	8.4	82.1	11.1	8.1
DH190077	---	---	92	48.2	100	5/20	31	0	9.3	84.4	9.9	6.6
BC Clementine	---	179	90	48.5	100	5/21	32	0	8.8	74.0	11.2	15.0
LCS Calypso	176	148	89	48.2	100	5/23	36	0	9.1	78.8	11.5	10.1
Endeavor	156	133	88	49.9	98	5/24	36	0	8.4	68.6	15.4	16.0
16ARS627-037	---	---	87	46.7	100	5/21	33	0	8.4	61.6	20.6	17.7
UT10406-9	---	---	87	46.5	100	5/24	35	0	8.5	61.5	18.9	20.8
13ARS537-19	159	155	86	47.8	100	5/20	30	0	9.5	81.1	10.9	7.5
UT11135-1	---	---	86	45.4	100	5/23	29	0	8.3	60.8	22.7	17.8
11ARS652-7	---	---	85	46.6	100	5/23	31	0	9.0	71.8	17.1	10.5
GN0-Vivar	---	136	83	48.7	100	5/23	35	0	9.2	90.5	6.7	3.2
BC Fay	---	150	80	47.1	100	5/23	32	0	9.5	77.5	13.9	8.6
KWS Donau	158	172	80	46.8	100	5/22	34	0	8.8	84.2	10.4	5.5
Thunder	154	186	78	48.2	100	5/22	29	0	9.4	82.6	8.5	8.0
Memento	---	---	78	47.4	100	5/23	31	0	9.6	67.0	15.9	17.8
Charles	148	131	77	48.2	100	5/21	33	0	9.8	71.1	16.5	12.5
DH171854	---	---	77	47.2	100	5/23	35	0	8.9	69.5	14.6	16.5
WintMalt	158	154	77	47.6	100	5/24	32	0	9.6	80.0	11.0	8.2
Marouetta	---	133	76	45.7	100	5/20	34	0	9.1	78.4	13.8	8.2
Avalon	---	---	76	50.0	99	5/22	36	0	10.1	79.2	12.0	9.0
DH141947	---	---	72	44.2	100	5/21	28	0	9.4	76.9	13.8	9.1
Flavia	165	171	64	45.6	100	5/22	28	0	8.9	77.9	15.2	7.2
12ARS777-2**	---	122	58	53.8	99	5/25	34	0	11.2	60.1	16.0	23.6
Top Shelf	---	145	58	47.7	100	5/21	30	0	10.9	79.3	10.9	9.7
12ARS777-1**	---	125	55	57.1	93	5/28	33	0	10.7	69.8	16.3	13.7
Upspring**	135	130	43	60.9	53	5/31	30	0	10.1	68.5	22.5	8.4
Average	154	151	80	48.4	98	5/23	32	0.2	9.3	74.0	14.5	11.7
LSD ($\alpha=.05$)	17	20	19	1	4	1	4	3	---	---	---	---
CV (%)	8.1	9.2	17.1	1.8	2.7	0.7	9.2	1095	---	---	---	---

* Varieties or selections in bold are not statistically different from the top yielding variety. Yields were damaged due to June 18, 19 frost events.

** Indicates hulless variety.

Table 31. Agronomic Data for Winter Barley at Aberdeen, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)	(>6/64)	Plump (>5.5/64)	% Thin
	2022	2023	2024*								
UTWB11604-2	---	---	149	51.2	98	5/25	34	10.5	94.9	4.3	1.5
UTWB11510-2	---	---	128	50.6	96	5/24	33	12.5	96.6	2.8	1.2
DH141947	201	50	127	49.1	99	5/24	31	11.6	97.7	1.5	1.6
13ARS526-8	---	---	125	52.6	99	5/25	32	10.9	98.1	1.6	0.9
11ARS652-7	---	80	125	52.4	99	5/26	36	10.6	96.3	3.1	1.7
13ARS537-19	203	30	123	52.9	94	5/20	31	11.9	97.7	1.8	1.2
Charles	180	43	121	52.4	95	5/21	33	14.7	97.2	1.6	0.7
UTWB10406-9	---	64	111	50.5	99	5/25	30	11.9	88.6	8.3	3.4
GN0-Vivar	199	104	107	50.7	96	5/25	33	12.4	98.5	0.9	0.7
Hirondella	193	56	107	48.1	99	5/25	29	9.2	93.5	4.1	2.9
Flavia	204	58	106	50.8	100	5/24	29	10.5	95.3	3.0	2.0
KWS Donau	195	89	104	51.8	98	5/25	33	10.1	97.2	1.9	1.6
BC Clementine	225	114	103	51.7	99	5/21	31	10.5	97.7	0.8	0.5
LCS Calypso	195	82	96	51.0	100	5/22	31	10.4	96.1	2.7	1.7
Memento	---	---	94	51.9	95	5/24	30	11.2	97.4	1.7	1.2
Top Shelf	183	63	92	51.0	99	5/20	33	11.8	98.5	1.0	1.3
DH190077	---	---	92	51.7	98	5/21	30	11.9	97.5	1.4	1.5
12ARS777-2**	179	7	91	57.8	81	5/29	36	16.1	86.0	9.9	5.4
Marouetta	148	46	91	50.3	95	5/23	29	10.3	96.7	2.2	1.7
DH171854	---	---	90	51.2	100	5/24	29	12.1	95.9	3.0	1.3
16ARS627-037	---	---	88	52.7	98	5/26	32	9.0	95.8	3.1	2.0
Endeavor	176	8	87	52.5	93	5/29	36	11.3	95.0	3.5	1.6
Thunder	194	80	87	52.1	95	5/24	29	10.5	96.9	1.9	1.6
BC Fay	214	105	81	50.2	98	5/25	29	11.2	98.4	0.7	0.4
WintMalt	183	72	80	51.3	96	5/29	29	9.7	94.2	4.1	2.8
UTWB10201	---	112	70	48.1	98	5/24	25	9.9	81.1	14.0	5.3
12ARS777-1**	173	17	68	58.5	70	6/2	34	14.3	78.5	15.9	6.8
UTWB11135-1	---	116	67	49.8	95	5/25	25	10.2	91.6	5.8	2.9
Avalon	---	22	66	53.0	95	5/23	35	11.1	96.8	1.4	1.1
Upspring**	152	2	32	60.2	6	6/2	33	14.1	81.6	14.0	5.2
Average	189	68***	97	51.9	93	5/25	31	11.4	94.2	4.1	2.1
LSD ($\alpha=.05$)	19	56	46	1	10	2	5	---	---	---	---
CV (%)	7.3	50.6	33.9	1.4	7.5	1.0	10.9	---	---	---	---

* 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 32. Winter Barley Yield Percentage of Location Averages, 2023-24.

Variety or Selection	(100% = Average)		Variety Average
	Aberdeen	Rupert	
UTWB11604-2	154	125	139
13ARS526-8	129	122	126
UTWB11510-2	132	118	125
Hirondella	110	129	119
11ARS652-7	129	106	117
13ARS537-19	127	107	117
UTWB10406-9	114	108	111
Charles	124	96	110
DH141947	131	89	110
BC Clementine	106	112	109
GN0-Vivar	111	103	107
DH190077	95	114	105
LCS Calypso	99	110	104
KWS Donau	107	99	103
Endeavor	90	110	100
16ARS627-037	91	108	99
Memento	97	96	97
UTWB10201	72	119	95
DH171854	93	96	95
Flavia	109	80	94
Marouetta	94	95	94
Thunder	89	97	93
BC Fay	84	99	91
WintMalt	83	95	89
UTWB11135-1	69	106	88
Top Shelf	95	72	83
12ARS777-2*	94	73	83
Avalon	68	94	81
12ARS777-1*	70	69	70
Upspring	33	53	43
Location Average (bu/A)	97	80	

*Indicates hulless lines

Chart 4. 2024 Winter Barley Yield Percentages Across All Locations

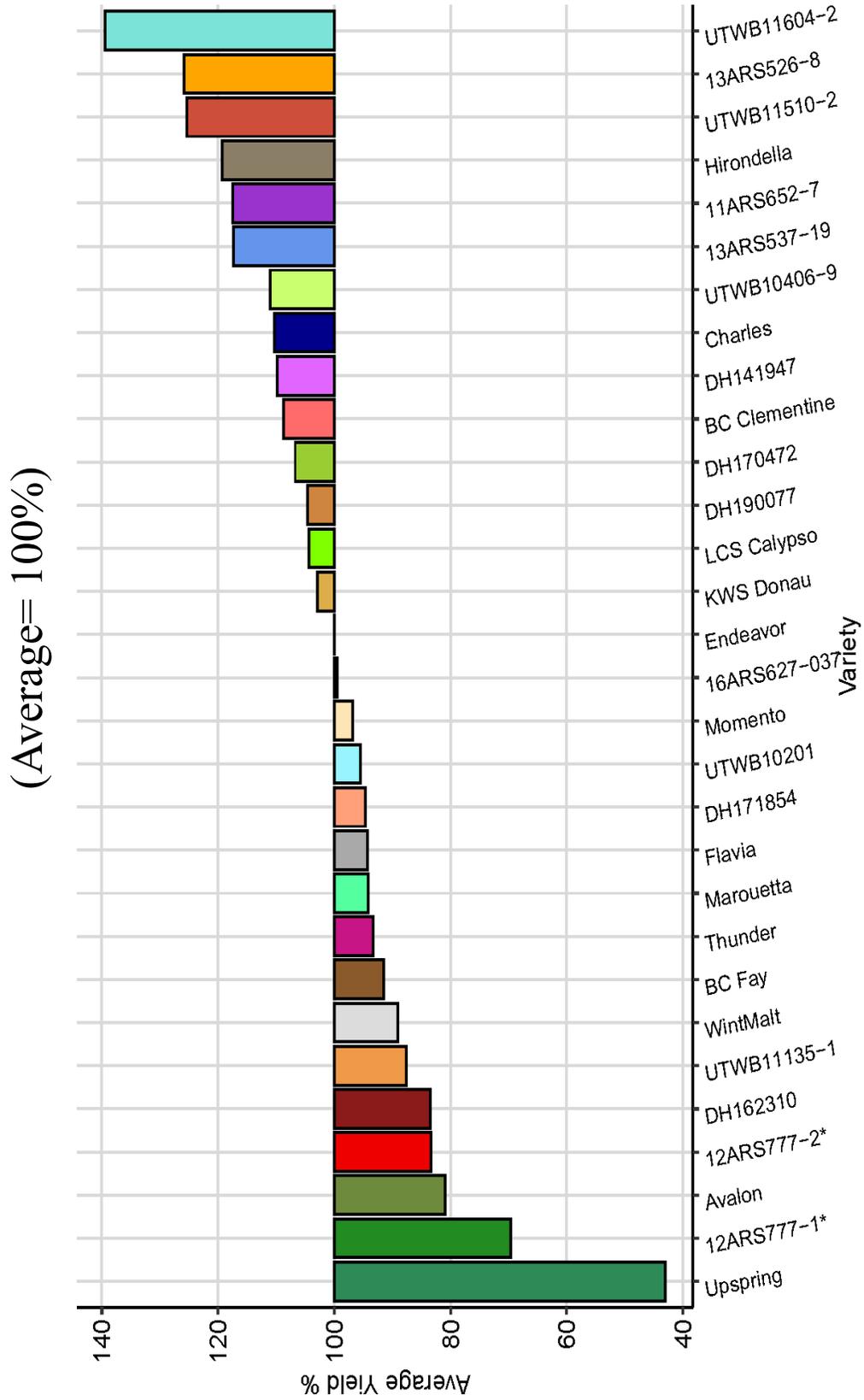


Table 33. Hard Spring Wheat Irrigated Nurseries, 3 Years Average (2022-2024; 12 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in)	Lodging (%)	Protein (%)
Dayn (W)	122	60.5	99	6/25	36	0	13.1
UI Gold (W)	118	59.7	100	6/27	36	1	13.1
WB9707	116	61.8	99	6/24	35	1	14.0
IDO2105S	116	60.9	100	6/25	35	0	12.8
SY-Teton (W)	114	58.8	100	6/25	33	1	12.2
Jefferson HF	114	60.8	100	6/25	35	7	13.0
WB7313 (W)	113	60.2	100	6/23	32	3	13.6
IDO2104HF (W)	111	60.1	100	6/27	35	0	13.1
Alum	111	60.6	100	6/27	37	6	13.9
IDO2202CL2	109	60.6	100	6/25	36	3	13.0
Holmes	108	61.2	100	6/24	33	1	13.9
WB7696 (W)	108	59.7	99	6/26	32	0	13.0
Expresso	107	60.1	100	6/28	35	0	14.1
UI Platinum (W)	106	59.8	100	6/23	32	1	13.0
WB7589 (W)	105	59.9	99	6/26	29	0	13.5
Dagmar	105	60.7	99	6/24	38	11	14.4
WB9668	104	60.5	100	6/25	32	1	14.7
Glee	104	60.5	100	6/25	36	5	13.4
Average	111	60.4	100	6/25	34	2	13.4
LSD ($\alpha=0.05$)	4	0.3	1	0.4	1	3	0.7
CV (%)	9.0	1.3	1.9	0.6	5.3	386	6.1

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

(W) = White

Table 34. Hard Spring Wheat Dryland Nurseries, 3 Years Average (2022-2024; 3 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in)	Protein (%)
Dayn (W)	39	61.1	100	7/9	27	11.2
Alum	38	61.5	100	7/12	26	12.1
SY-Teton (W)	36	58.5	100	7/12	24	11.4
Glee	34	61.4	100	7/10	28	11.9
IDO2105S	34	61.4	100	7/9	25	11.4
Dagmar	33	61.2	100	7/10	26	12.2
Choteau	33	61.0	100	7/11	25	12.8
Rocker	32	61.6	100	7/13	25	12.0
WB9879CLP	32	60.9	100	7/13	25	12.6
WB7202CLP (W)	32	59.8	100	7/8	23	12.0
IDO2104HF	32	59.8	100	7/11	25	11.9
Jefferson HF	32	61.1	100	7/9	25	12.1
WB9724CLP	31	61.5	100	7/10	23	12.3
UI Platinum (W)	31	60.4	99	7/8	23	11.6
IDO2202CL2	29	60.1	100	7/9	26	12.3
Expresso	27	60.1	98	7/14	24	13.5
Average	33	60.7	100	7/10	25	12.1
LSD ($\alpha=.05$)	3	1	2	0.5	1	1
CV (%)	12.4	1.1	2.2	0.3	5.0	4.8

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

(W) = White

No lodging to report.

Table 35. Irrigated Hard Spring Wheat Data Combined from Rupert, Idaho Falls, Teton and Aberdeen, 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Heading Date	Height (in)	Lodging (%)	Protein (%)
WA8393	114	62.2	6/24	36	0	12.8
Dayn (W)	113	61.2	6/25	36	1	13.0
Alzada	111	60.3	6/28	38	0	10.7
Alum	109	60.7	6/28	38	6	13.8
CP3055	106	57.8	7/4	39	0	12.5
SY-Teton (W)	106	59.7	6/26	33	1	13.0
Jefferson HF	105	61.4	6/26	35	0	12.6
IDO2104HF (W)	105	61.1	6/27	35	0	13.4
CP3322	105	60.3	7/2	37	0	12.3
WB7747	105	61.9	6/26	31	0	13.5
WA8407	104	62.3	6/27	35	6	13.8
WB9929	104	59.9	6/28	38	0	14.0
IDO2105S	104	61.5	6/26	35	0	12.9
UI Gold (W)	103	60.1	6/28	35	2	12.9
MT Carlson	102	60.7	6/27	37	0	13.6
WB8148 (durum)	100	61.1	6/29	30	0	12.8
LCS Hammer AX	100	61.2	6/27	36	0	13.4
WB7313 (W)	100	61.5	6/24	31	3	13.9
BZ920-136	99	60.6	6/24	34	0	13.7
MT21074	99	60.9	6/28	36	0	13.4
WA8406	99	61.4	6/26	35	0	14.1
Hale	98	61.2	6/28	38	0	13.6
WB9707	98	62.5	6/25	35	1	13.8
Dagmar	98	61.2	6/25	38	3	14.3
BZ920-142W	97	63.6	6/27	34	0	13.5
IDO2202CL2	97	61.4	6/25	35	0	12.8
Glee	97	61.8	6/25	37	0	13.6
Holmes	96	61.8	6/25	33	0	13.8
WB9668	96	61.7	6/26	32	1	14.8
MT Ubet	96	60.7	6/27	36	0	13.9
UI Platinum (W)	95	61.0	6/24	32	0	13.3
Expresso	95	61.0	6/28	35	0	14.1
WB9749	94	61.9	6/26	34	0	13.7
CP3119A	93	56.0	7/5	39	0	12.2
WB7589 (W)	92	61.2	6/25	28	0	13.3
CP3201AX	92	60.9	6/29	36	1	14.1
WB7696 (W)	90	60.3	6/26	32	0	13.0
Average	100	61.0	6/27	35	1	13.4
LSD ($\alpha=.05$)	8	1	0.7	1	3	1
CV (%)	10.7	1.5	0.5	5.1	761	3.9

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

(W) = White

All plots had full stand.

Hard Spring Wheat

Table 36. Agronomic Data for Hard Spring Wheat at Rupert, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in)	Lodging (%)	Protein (%)
	2022	2023	2024*					
Dayn (W)	120	129	101	60.2	6/21	37	3	12.7
WA8393	---	---	96	60.8	6/19	36	0	13.2
LCS Hammer AX	---	132	95	60.6	6/22	38	0	13.3
WB9707	109	132	95	61.7	6/21	37	3	13.7
WB7313 (W)	119	120	94	60.0	6/19	31	13	13.8
WB9668	99	110	94	60.9	6/22	35	4	14.5
UI Gold (W)	113	133	93	59.3	6/23	35	8	13.0
IDO2104HF (W)	101	113	92	60.6	6/21	37	0	14.2
IDO2105S	112	123	92	61.1	6/22	37	0	12.5
Jefferson HF	102	126	92	60.9	6/22	36	0	12.8
WB7747	---	---	92	60.6	6/22	34	0	13.0
CP3055	---	---	91	58.2	6/29	41	0	12.0
IDO2202CL2	105	115	90	60.3	6/21	38	0	12.8
SY-Teton (W)	97	115	90	59.1	6/21	36	3	2.8
WA8407	---	---	89	61.7	6/22	35	25	12.4
Alum	96	106	88	60.5	6/22	38	24	14.0
WA8406	---	---	87	60.8	6/21	37	0	14.2
WB9929	---	---	87	59.6	6/24	39	0	13.8
Alzada (durum)	---	---	86	59.3	6/22	38	1	10.6
BZ920-136	---	---	86	59.7	6/19	36	0	13.1
Espresso	110	118	85	60.0	6/23	38	0	13.6
MT Dutton	---	127	85	58.5	6/22	40	3	13.4
MT21074	---	---	85	61.8	6/22	37	0	11.9
WB8148 (durum)	---	---	85	60.7	6/23	31	0	11.4
BZ920-142W	---	---	84	63.1	6/21	36	0	12.7
Glee	106	105	84	60.9	6/21	38	0	13.7
WB7696 (W)	113	119	84	59.9	6/22	34	0	13.5
CP3322	---	---	83	60.5	6/24	36	0	11.8
UI Platinum (W)	82	98	83	59.3	6/19	34	0	14.1
WB9749	---	---	83	61.3	6/22	36	0	12.8
Dagmar	95	123	82	59.9	6/20	41	0	13.5
CP3201AX	---	---	81	59.4	6/24	37	3	14.3
Holmes	113	123	81	61.0	6/20	34	0	12.9
SY Gunsight	112	106	79	58.4	6/22	32	0	13.4
MT Ubet	---	129	78	59.5	6/22	37	0	13.4
Hale	---	116	77	60.9	6/22	39	0	13.5
MT Carlson	---	---	76	59.2	6/22	37	0	13.5
WB7589 (W)	102	117	71	59.0	6/20	31	0	12.5
CP3119A	---	---	65	56.4	6/30	39	0	11.5
Average	104	117	86	60.1	6/22	36	3	12.8
LSD ($\alpha=.05$)	14	9	11	1	1	3	15	---
CV (%)	9.8	5.5	9.2	0.9	0.6	5.3	402	---

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

All plots had full stand.

(W) = White

Table 37. Agronomic Data for Hard Spring Wheat at Aberdeen, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2022	2023	2024*						
Dayn (W)	126	153	128	61.4	100	6/18	39	0	14.1
WA8393	---	---	124	62.6	100	6/17	38	0	13.5
Jefferson HF	119	137	122	61.6	100	6/18	37	0	13.6
LCS Ascent	---	---	121	62.3	100	6/19	39	0	13.8
WB9929	---	---	120	59.6	100	6/18	43	0	15.3
Alzada (durum)	---	---	119	59.9	100	6/22	42	0	11.4
Espresso	113	120	118	61.5	100	6/21	38	0	15.3
MT Ubet	---	130	118	61.6	100	6/18	39	0	14.5
WB7747 (W)	---	---	118	62.6	100	6/19	32	0	14.9
IDO2105S	128	137	117	63.0	100	6/18	38	0	13.8
WB9707	123	134	117	60.8	100	6/17	38	0	14.6
CP3201AX	---	---	116	61.7	100	6/21	42	0	14.6
MT Carlson	---	132	116	61.2	100	6/21	39	0	14.5
Alum	103	130	115	61.7	100	6/22	41	0	14.6
WB7589 (W)	110	117	114	61.6	99	6/18	29	0	14.0
SY-Teton (W)	116	133	113	58.9	98	6/17	35	0	13.8
IDO2202CL2	116	126	113	61.5	100	6/17	37	0	13.7
LCS Buster	---	---	112	58.0	100	6/25	42	20	12.5
Dagmar	108	121	111	61.7	100	6/18	41	0	15.4
Hale	---	128	111	61.3	100	6/21	40	0	14.7
BZ920-136	---	---	110	61.3	100	6/17	37	0	14.5
MT21074	---	---	110	61.4	100	6/20	39	0	14.4
UI Gold (W)	131	142	110	59.1	100	6/20	38	0	13.6
BZ920-142W	---	---	109	63.7	100	6/20	36	0	15.0
WB9668	103	111	108	61.7	100	6/18	33	0	15.5
WB9749	---	---	108	62.4	100	6/17	36	0	14.9
WB7696 (W)	117	120	108	59.9	100	6/18	34	0	12.8
IDO2104HF (W)	121	127	107	61.5	100	6/20	37	0	14.1
LCS Boom	---	---	106	63.2	100	6/18	38	0	14.9
WA8407	---	---	106	62.8	100	6/18	38	0	15.6
LCS Hammer AX	---	125	105	60.6	100	6/18	39	0	14.5
CP3322	---	---	104	59.8	99	6/25	40	0	14.1
Glee	117	121	102	61.9	100	6/18	39	0	14.2
UI Platinum (W)	120	132	102	60.9	100	6/18	34	0	13.9
WA8406	---	---	102	60.9	100	6/17	38	0	14.7
WB8148 (durum)	---	---	100	60.5	100	6/22	34	0	14.9
CP3055	---	---	100	57.1	100	6/29	40	0	14.5
Holmes	118	121	99	61.7	100	6/18	35	0	15.2
CP3119A	---	---	92	56.6	100	6/28	42	0	13.4
WB7313 (W)	118	123	82	61.6	100	6/17	34	0	15.1
Average	117	127	111	61.1	100	6/19	38	1	14.3
LSD ($\alpha=.05$)	10	16	17	1.3	1	1.7	2	5	---
CV (%)	6.4	8.8	11.1	1.5	0.6	0.7	4.5	775	---

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

(W) = White

Table 38. Agronomic Data for Hard Spring Wheat, Idaho Falls, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2022	2023	2024*					
SY Gunsight	114	106	135	60.3	6/27	32	0	13.2
MT Carlson	---	---	128	61.3	6/27	37	0	13.6
WA8406	---	---	127	61.7	6/25	35	0	13.3
Expresso	121	123	125	61.5	6/27	33	0	14.1
CP3119A	---	---	123	58.2	7/3	39	0	12.4
WB7589 (W)	101	123	120	60.7	6/25	28	0	13.9
IDO2202CL2	118	133	120	61.3	6/24	37	0	12.6
MT Dutton	115	125	120	60.2	6/27	38	16	13.3
Dayn (W)	122	142	119	61.4	6/24	37	0	12.4
LCS Hammer AX	116	133	119	61.8	6/27	37	0	13.6
Jefferson HF	116	132	117	60.9	6/25	35	0	12.9
WB9749	---	---	117	62.5	6/25	34	0	13.6
UI Gold (W)	114	130	116	60.8	6/28	36	0	12.6
Alum	128	117	116	62.3	6/27	39	0	13.8
UI Platinum (W)	113	113	116	60.3	6/23	32	0	13.1
MT Ubet	115	125	114	60.6	6/26	36	0	14.1
WB8148 (durum)	---	---	114	61.6	6/27	29	0	12.3
WB9929	---	---	114	60.1	6/28	39	0	13.3
WB9668	100	120	114	62.2	6/25	31	0	14.5
WA8407	---	---	113	62.8	6/26	37	0	14.1
Dagmar	124	130	113	61.4	6/25	39	11	14.3
IDO2104HF (W)	119	120	113	61.4	6/26	36	0	12.7
WB7313 (W)	104	133	113	61.4	6/23	34	0	13.4
Holmes	120	120	112	61.8	6/25	33	0	14.0
SY-Teton (W)	114	124	111	59.7	6/24	32	0	12.8
IDO2105S	118	131	111	61.3	6/25	35	0	12.8
BZ920-142W	---	---	111	63.9	6/25	34	0	13.0
CP3055	---	---	110	59.7	7/2	40	0	12.0
WB9707	97	134	110	62.4	6/24	36	0	13.2
BZ920-136	---	---	110	60.5	6/22	34	0	13.4
WA8393	---	---	108	62.6	6/24	37	0	12.0
Hale	120	123	107	62.5	6/27	38	0	13.5
WB7696 (W)	101	129	107	59.1	6/25	32	0	12.8
CP3322	---	---	107	61.4	7/2	40	0	12.6
Glee	121	119	106	61.5	6/24	38	0	13.3
MT21074	---	---	106	62.4	6/28	36	0	13.4
CP3201AX	---	---	102	61.4	6/28	36	0	13.7
WB7747	---	---	99	62.2	6/25	31	0	13.9
Average	113	125	114	61.3	6/26	35	0.7	13.2
LSD ($\alpha=.05$)	10	13	8	0.6	0.8	2	7	---
CV (%)	6.9	7.3	5.0	0.7	0.3	4.2	731	---

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

(W) = White

**All plots had full stand.

Table 39. Agronomic Data for Hard Spring Wheat at Tetonia, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*				
Alzada (durum)	---	---	127	61.8	7/12	35	10.1
CP3322	---	---	114	59.5	7/18	33	10.7
CP3055	---	---	114	56.3	7/18	36	11.6
CP3119A	---	---	112	52.9	7/19	36	11.3
Alum	124	117	112	58.1	7/12	33	12.9
IDO2104HF (W)	110	114	112	60.8	7/11	31	12.5
WB-Hartline	---	---	111	58.2	7/13	34	11.2
WA8393	---	---	109	62.9	7/8	33	12.4
WA8407	---	---	109	61.9	7/12	32	13.2
SY-Teton (W)	107	127	107	61.3	7/11	32	12.5
WB8148 (durum)	---	---	102	61.5	7/13	27	12.5
MT Carlson	---	99	98	61.3	7/11	34	12.8
Dayn (W)	121	111	97	61.7	7/9	32	12.6
MT21074	---	---	96	57.9	7/13	32	13.7
WB7747	---	---	96	62.2	7/10	27	12.2
WA8406	---	---	95	62.1	7/10	31	14.0
Glee	112	96	93	62.9	7/9	33	13.0
UI Gold (W)	130	116	93	61.1	7/12	32	12.4
WB9929	---	---	92	59.9	7/13	33	13.4
BZ920-136	---	---	92	60.2	7/7	29	13.6
SY Gunsight	121	103	91	61.1	7/13	28	11.0
Jefferson HF	113	114	91	61.7	7/9	30	11.2
IDO2105S	118	103	90	62.5	7/8	30	12.3
Holmes	107	94	89	63.0	7/8	31	13.1
BZ920-142W	---	---	88	62.5	7/10	30	13.1
UI Platinum (W)	113	105	87	63.8	7/7	27	11.9
MT Dutton	---	97	87	63.5	7/12	33	13.0
MT Ubet	---	109	84	59.9	7/12	33	13.4
Dagmar	102	92	81	61.2	7/8	33	13.8
WB7313 (W)	114	103	79	62.0	7/7	27	13.4
WB7589 (W)	107	107	79	63.0	7/9	25	12.9
LCS Hammer AX	---	103	78	63.4	7/11	31	12.2
WB9668	110	106	72	61.8	7/8	29	14.8
WB9749	---	---	72	61.8	7/9	29	13.5
Espresso	104	102	72	61.5	7/12	30	13.3
IDO2202CL2	109	102	70	61.1	7/8	30	12.1
Hale	---	95	69	62.5	7/11	35	12.6
WB7696 (W)	117	107	68	62.4	7/10	27	12.8
WB9707	112	141	65	63.2	7/7	30	13.7
CP3201AX	---	---	62	60.9	7/13	31	13.9
Average	113	108	91	61.2	7/11	31	12.7
LSD ($\alpha=.05$)	13	20	20	2.1	1.5	3	---
CV (%)	8.4	12.9	15.8	2.4	0.6	6.3	---

* Yield is corrected to 12 % moisture. Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

Hard Spring Wheat

Table 40. Agronomic Data for Hard Spring Wheat at Soda Springs, Dryland, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
CP3055	---	---	37	57.0	91	7/18	25	10.0
CP3119A	---	---	35	55.4	100	7/19	27	10.4
Alzada (durum)	---	---	34	59.9	99	7/9	22	10.3
Hale	---	58	33	62.3	98	7/10	24	9.6
Alum	26	56	32	62.3	100	7/10	24	9.9
CP3322	---	---	32	59.6	100	7/17	24	9.3
Dayn (W)	30	56	31	61.3	100	7/7	25	9.5
WA8393	---	---	31	62.8	100	7/7	23	10.1
WA8407	---	---	31	62.9	100	7/11	25	10.2
WB9929	---	---	29	60.8	100	7/9	26	8.0
MT21074	---	---	29	61.0	100	7/12	23	9.6
MT Ubet	---	---	29	61.1	99	7/9	23	10.4
WA8406	---	---	29	62.1	100	7/5	24	10.4
BZ920-142W	---	---	28	62.8	100	7/7	22	11.8
MT Carlson	---	---	28	61.7	100	7/10	22	9.9
SY-Teton (W)	26	56	28	59.7	100	7/8	23	10.0
Rocker	27	43	27	62.0	99	7/11	24	9.7
Glee	26	48	27	61.7	100	7/8	26	10.3
UI Gold (W)	27	51	26	60.6	100	7/9	23	10.3
Choteau	---	---	26	62.0	99	7/9	24	10.5
Dagmar	28	47	26	61.5	99	7/7	23	10.7
WB9879CLP	24	48	25	61.9	100	7/11	24	10.6
WB9724CLP	24	36	25	62.2	99	7/8	22	10.6
BZ920-136	---	---	25	61.1	100	7/7	23	11.5
IDO2104HF (W)	23	48	24	60.5	99	7/8	23	11.6
LCS Hammer AX	---	43	24	61.7	100	7/8	23	10.2
UI Platinum (W)	24	46	24	61.9	98	7/7	20	9.7
Jefferson HF	25	47	24	61.3	99	7/7	24	10.2
Holmes	26	43	23	62.3	100	7/8	20	10.7
IDO2202CL2	26	39	23	60.3	99	7/7	23	10.9
WB7202CLP (W)	25	49	22	61.1	100	7/7	20	10.6
WB8148 (durum)	---	---	22	61.3	100	7/9	21	10.6
IDO2105S	30	51	21	61.9	100	7/8	22	9.7
CP3201AX	---	---	19	59.9	100	7/12	24	11.5
Expresso	19	45	17	61.0	94	7/10	23	11.5
Average	25	47	27	61.1	99	7/9	23	10.3
LSD ($\alpha=.05$)	4	9	4	1	6	2	2	---
CV (%)	11.8	13.4	10.4	1.3	4.1	0.6	5.3	---

* Yield corrected to 12% moisture. Varieties or selections in bold are not statistically different from the top yielding variety.

(W) = White

Table 41. Hard Spring Wheat Yield Percentage of Location Averages, 2024.

Variety or Selection	(100% = Average)					Soda Springs	Variety Average
	Aberdeen	Rupert	Idaho Falls	Tetonia			
Alzada (durum)	107	100	---	140		127	119
Dayn (W)	115	117	105	107		115	112
CP3055	90	106	97	125		137	111
WA8393	112	112	94	120		114	110
Alum	103	102	101	123		119	110
LCS Ascent	109	---	---	---		---	109
WA8407	96	103	99	120		113	106
CP3322	94	97	94	126		118	105
SY-Teton (W)	102	105	98	118		102	105
WB9929	108	101	100	101		109	104
CP3119A	82	76	107	124		130	104
SY Gunsight	---	92	118	100		---	103
IDO2104HF (W)	96	107	99	123		90	103
WA8406	92	101	112	104		106	103
MT Carlson	105	88	112	108		102	103
UI Gold (W)	99	108	102	102		96	102
Rocker	---	---	---	---		101	101
WB7747	106	107	87	105		---	101
Jefferson HF	110	107	103	100		87	101
MT21074	99	99	93	106		108	101
LCS Buster	101	---	---	---		---	101
MT Dutton	---	99	105	96		---	100
MT Ubet	106	91	100	92		108	99
BZ920-142W	98	98	97	97		104	99
BZ920-136	99	100	96	101		91	97
IDO2105S	105	107	97	99		77	97
LCS Hammer AX	95	110	104	86		90	97
Glee	92	98	93	102		99	97
WB9668	98	109	100	80		---	97
Hale	100	90	94	76		123	96
WB8148 (durum)	90	99	100	112		81	96
Choteau	---	---	---	---		96	96
WB9707	105	110	97	71		---	96
Dagmar	100	95	99	90		95	96
LCS Boom	96	---	---	---		---	96
UI Platinum (W)	92	97	101	96		88	95
WB7589 (W)	103	83	105	87		---	94
IDO2202CL2	101	105	105	77		83	94
WB9749	98	97	103	80		---	94
WB9724CLP	---	---	---	---		93	93
WB9879CLP	---	---	---	---		93	93
Holmes	89	94	98	98		85	93
WB7313 (W)	74	109	99	87		---	92
Expresso	106	99	109	79		65	92
WB7696 (W)	97	98	94	75		---	91
CP3201AX	105	94	90	68		72	86
WB7202CLP (W)	---	---	---	---		81	81
Location Average (bu/A)	111	86	114	91		27	

(W) = White

Chart 5. 2024 Hard Spring Wheat Yield Percentages Across All Locations

(Average= 100%)

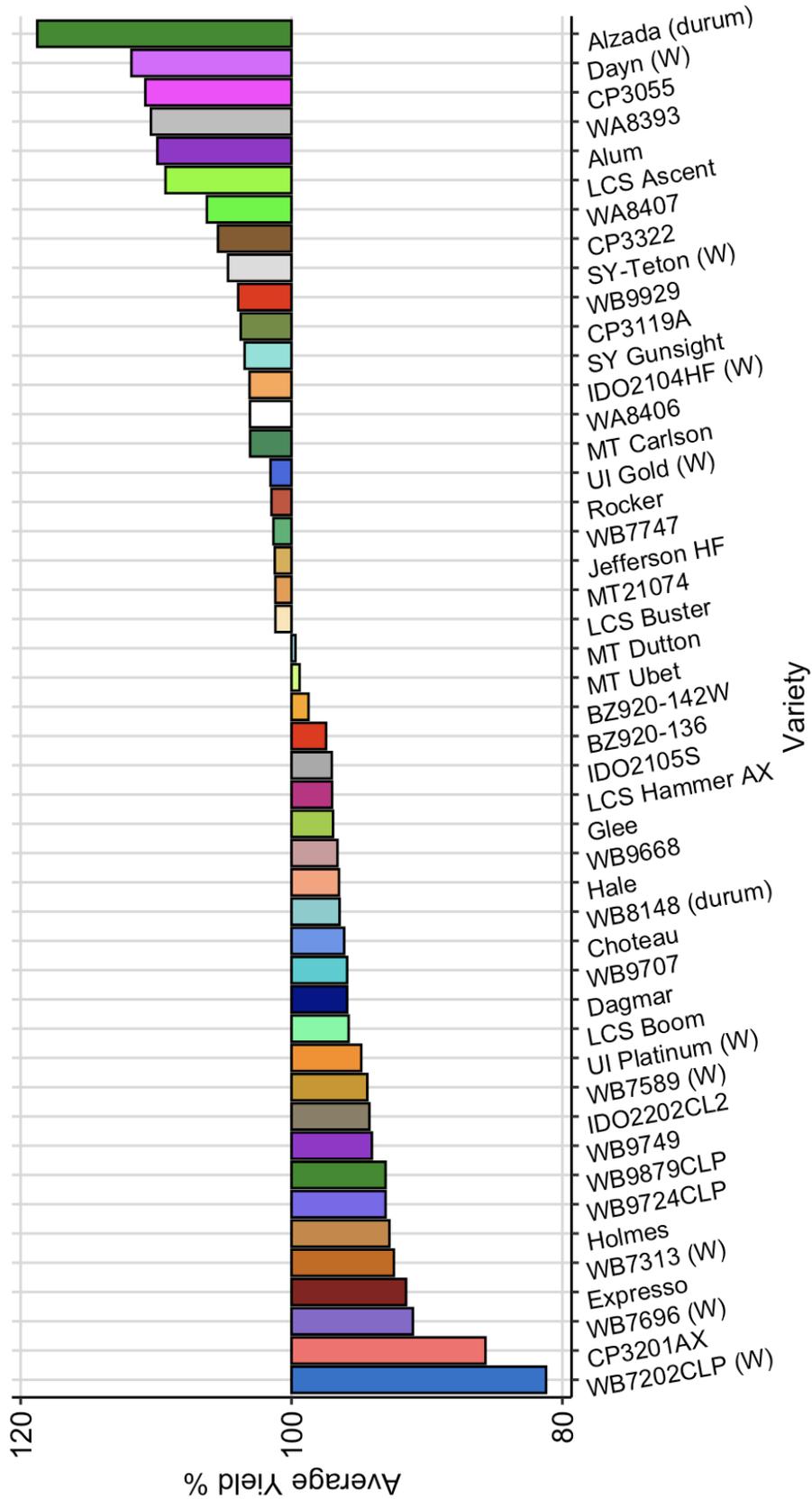


Table 42. Soft White Spring Wheat Irrigated Nurseries, 3-Year Averages (2022-2024; 12 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)
WA8327	136	59.8	99	6/22	36	5	10.3
UI Warrior	123	61.0	100	6/25	37	1	10.4
WB6430	123	59.2	100	6/25	34	0	10.3
Alturas	122	59.4	100	6/26	37	1	10.3
UI Stone	121	59.6	100	6/24	36	2	10.3
Melba (club)	118	59.3	100	6/28	36	6	9.8
Seahawk	117	60.0	99	6/27	38	2	10.2
UI Cookie	116	58.6	100	6/25	36	0	10.7
Ryan	115	58.9	100	6/23	35	11	10.7
Tekoa	113	60.6	100	6/28	37	4	10.3
Louise	108	59.0	100	6/25	39	21	10.6
Average	118	59.6	100	6/25	36	4	10.3
LSD ($\alpha=.05$)	5	0.3	0.6	3	1	5	0.4
CV (%)	9.9	1.1	1	3	5	256	4.3

* Varieties are not statistically different from the top yielding variety.

Table 43. Soft White Spring Wheat Dryland Nurseries, 3-Year Averages (2022-2024; 3 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Protein (%)
Alturas	42	59.9	99	7/13	25	9.7
UI Stone	41	59.9	100	7/11	26	10.4
UI Warrior	41	60.8	99	7/11	26	10.1
Louise	40	60.2	100	7/13	29	9.8
Melba (club)	39	60.2	99	7/14	24	10.1
WB6430	38	60.2	100	7/11	23	10.3
Ryan	38	59.1	99	7/10	25	10.2
Seahawk	35	60.3	100	7/14	24	10.2
Tekoa	35	61.2	100	7/14	27	10.3
WB6211CLP	34	58.4	99	7/10	25	10.2
UI Cookie	30	59.3	100	7/11	26	10.3
Average	37	59.9	100	7/12	26	10.1
LSD ($\alpha=.05$)	3	1	2	1	1	1
CV (%)	11.1	1.1	2.3	0.8	5.6	3.8

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

** Indicates club wheat

No lodging to report.

Table 44. Irrigated Soft White Spring Wheat Data Combined from Aberdeen, Rupert, Idaho Falls and Tetonia, 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
Alturas	119	60.3	100	6/28	37	0	10.2
WA8384	117	60.9	100	6/26	38	0	10.3
WA8327	115	60.7	100	6/28	37	0	10.2
Melba**	114	59.8	100	6/30	36	3	9.4
UI Warrior	112	61.7	100	6/27	37	0	10.0
WB6430	112	59.6	100	6/26	35	0	9.9
UI Stone	111	60.6	100	6/26	36	0	10.4
Tekoa	110	61.3	100	6/29	38	0	9.9
UI Cookie	109	59.8	100	6/26	36	0	10.5
Butch CL+	107	60.1	100	6/26	33	0	10.5
Ryan	106	60.2	100	6/25	34	0	10.8
Louise	105	60.2	100	6/28	40	18	10.2
Seahawk	108	60.2	100	6/29	37	0	10.0
Roger**	95	60.6	100	6/27	35	0	10.2
Average	110	60.4	100	6/27	36	2	10.2
LSD ($\alpha=.05$)	10	1	0.2	1	1	5	0.6
CV (%)	13.0	1.2	0.2	0.5	5.0	514	3.9

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

** Indicates club wheat

Table 45. Agronomic Data for Soft White Spring Wheat at Rupert, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2022	2023	2024*					
WA8327	112	---	96	60.3	6/23	37	0	9.6
WB6430	112	128	95	58.9	6/22	35	0	9.7
Alturas	102	115	94	59.5	6/24	33	0	10.6
UI Warrior	109	119	94	60.8	6/22	38	0	9.8
UI Cookie	106	117	93	58.9	6/22	34	0	10.5
Tekoa	102	111	91	60.8	6/25	39	0	10.3
Ryan	112	104	87	59.7	6/22	32	0	11.0
WA8384	---	---	86	60.3	6/22	35	0	10.7
UI Stone	103	125	85	59.7	6/22	35	0	10.1
Seahawk	109	112	81	60.0	6/25	37	0	10.4
Louise	102	112	77	60.0	6/22	39	26	10.1
Butch CL+	---	103	76	60.0	6/22	31	0	9.8
Melba**	98	107	72	58.6	6/26	35	9	9.5
Roger**	---	96	61	59.0	6/23	29	0	10.5
Average	102	112	85	59.6	6/23	35	2	10.1
LSD ($\alpha=.05$)	14	10	12	0.8	1	3	12	---
CV (%)	9.8	6.4	9.2	0.9	0.5	6.8	395	---

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

** Indicates club wheat

*** All plots had full stand.

Table 46. Agronomic Data for Soft White Spring Wheat at Aberdeen, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2022	2023	2024*						
Alturas	111	147	136	60.9	100	6/19	41	0	10.7
Melba**	111	144	134	61.5	100	6/23	38	3	10.4
WA8327	113	149	130	61.9	100	6/22	39	0	11.1
WB6430	115	150	130	61.2	100	6/17	38	0	11.1
UI Warrior	123	145	129	63.0	100	6/20	39	0	10.7
Butch CL+	--	138	127	61.6	100	6/17	36	0	11.1
WA8384	---	---	123	61.9	100	6/18	42	1	11.3
Tekoa	111	137	122	61.7	100	6/20	41	1	11.0
Ryan	112	139	122	61.4	100	6/18	38	0	11.6
UI Cookie	114	144	120	60.2	100	6/17	40	0	11.3
UI Stone	128	154	116	61.3	100	6/17	38	1	11.6
Seahawk	108	142	115	61.4	99	6/21	39	0	11.4
Louise	102	130	112	61.0	100	6/21	41	21	11.2
Roger**	--	128	100	61.1	100	6/18	38	0	11.7
Average	113	140	123	61.4	100	6/19	39	2	11.2
LSD ($\alpha=.05$)	16	13	17	0.8	1	1.9	3	11	---
CV (%)	10.2	6.6	9.4	0.8	0.5	0.8	4.5	457	---

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

** Indicates club wheat

Table 47. Agronomic Data for Soft White Spring Wheat, Idaho Falls, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Lodging (%)	Protein (%)
	2022	2023	2024*					
UI Warrior	129	143	137	62.1	6/26	37	0	10.2
WA8327	131	138	133	60.7	6/27	37	0	10.2
WA8384	---	---	130	60.6	6/26	39	0	9.8
Alturas	132	138	129	60.0	6/27	38	0	9.9
Seahawk	122	128	126	61.0	6/27	38	0	9.7
Tekoa	116	125	126	61.3	6/29	37	0	9.9
UI Cookie	126	131	124	59.1	6/25	38	0	10.0
UI Stone	130	143	122	60.1	6/26	38	0	10.2
WB6430	125	142	120	59.4	6/26	37	0	10.1
Melba**	113	131	118	60.7	6/29	36	0	9.4
Ryan	110	140	115	58.9	6/24	35	0	10.9
Butch CL+	---	119	113	59.6	6/25	35	0	10.6
Louise	102	---	111	59.8	6/27	41	24	10.0
Roger**	---	113	109	61.0	6/27	38	0	9.8
Average	118	130	121	60.3	6/27	37	2	10.1
LSD ($\alpha=.05$)	10	16	10	0.5	1	2	13	---
CV (%)	5.9	8.3	5.6	0.6	0.3	3.9	528	---

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

** Indicates club wheat

***All plots had full stand.

Table 48. Agronomic Data for Soft White Spring Wheat at Tetonia, Irrigated, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*				
UI Stone	130	102	121	61.1	7/9	32	9.5
Melba**	125	128	120	57.9	7/14	34	8.2
Alturas	120	127	112	60.6	7/12	37	9.4
WA8327	141	119	112	60.0	7/12	34	9.7
Louise	---	---	111	60.1	7/13	38	9.3
Roger**	---	109	109	61.6	7/11	34	8.7
WA8384	---	---	109	60.8	7/9	35	9.4
Butch CL+	---	120	106	59.2	7/9	30	10.3
WB6430	127	127	105	59.1	7/10	32	8.6
Ryan	115	120	101	60.8	7/8	34	9.8
UI Warrior	133	119	100	60.9	7/11	32	9.2
UI Cookie	120	103	99	60.9	7/9	33	10.2
Tekoa	112	101	97	61.3	7/14	35	8.5
Seahawk	119	122	115	57.8	7/13	35	8.4
Average	120	116	108	60.4	7/11	34	9.2
LSD ($\alpha=.05$)	14	27	35	3	3	5	---
CV (%)	7.9	16.1	22.0	2.0	0.6	6.0	---

* Varieties or selections in bold are not statistically different from the top yielding variety. Yield corrected to 12 % moisture.

** Indicates club wheat

All plots had full stand. No lodging to report.

Table 49. Agronomic Data for Soft White Spring Wheat at Soda Springs, Dryland, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)
	2022	2023	2024*					
Alturas	35	49	32	59.7	96	7/10	24	8.4
WB6430	29	54	30	59.7	100	7/8	21	8.8
Louise	28	57	30	60.5	99	7/10	27	8.6
WA8327	---	---	30	59.5	100	7/11	25	7.9
UI Warrior	29	58	30	59.5	98	7/10	24	9.3
Seahawk	33	43	29	59.6	100	7/12	24	8.9
Tekoa	34	41	28	59.7	100	7/12	26	9.0
Melba**	29	54	28	59.6	98	7/12	23	8.7
Roger**	---	56	28	59.5	96	7/10	22	8.4
WA8384	---	---	27	59.8	100	7/8	25	8.7
WB6211CLP	28	50	25	59.8	96	7/8	23	8.9
Ryan	31	51	25	59.9	98	7/7	23	8.9
UI Stone	32	64	25	59.5	100	7/9	23	9.0
Butch CL+	32	43	23	60.5	99	7/9	22	9.6
UI Cookie	25	43	22	59.8	100	7/8	22	9.2
Average	31	52	27	59.7	99	7/9	23	8.8
LSD ($\alpha=0.05$)	6	11	4	1	5	2	2	---
CV (%)	12.0	14.8	10.6	1.3	3.9	0.8	5.2	---

* Varieties or selections in bold are not statistically different from the top yielding variety. Yield corrected to 12 % moisture.

** Indicates club wheat

No lodging to report at this location.

Table 50. Soft White Spring Wheat Yield Percentage of Location Averages, 2024.

Variety or Selection	(100% = Average)					Variety Average
	Aberdeen	Rupert	Idaho Falls	Tetonia	Soda Springs	
Alturas	110	111	106	105	119	110
WA8327	106	113	110	105	110	109
UI Warrior	105	111	113	94	109	106
WB6430	105	111	99	98	111	105
WA8384	100	101	108	103	101	102
Melba*	109	85	98	113	104	102
Tekoa	99	107	104	91	105	101
UI Stone	94	99	101	113	93	100
Louise	91	91	92	104	110	98
Seahawk	93	95	104	83	107	97
Ryan	99	101	95	95	93	97
UI Cookie	98	109	103	93	80	96
Butch CL+	103	90	93	100	85	94
WB6211CLP	---	---	---	---	94	94
Roger*	82	71	90	103	102	90
Location Average (bu/A)	123	85	121	108	27	

* Indicates club wheat

Chart 6. 2024 Soft White Spring Wheat Yield Percentages Across All Locations

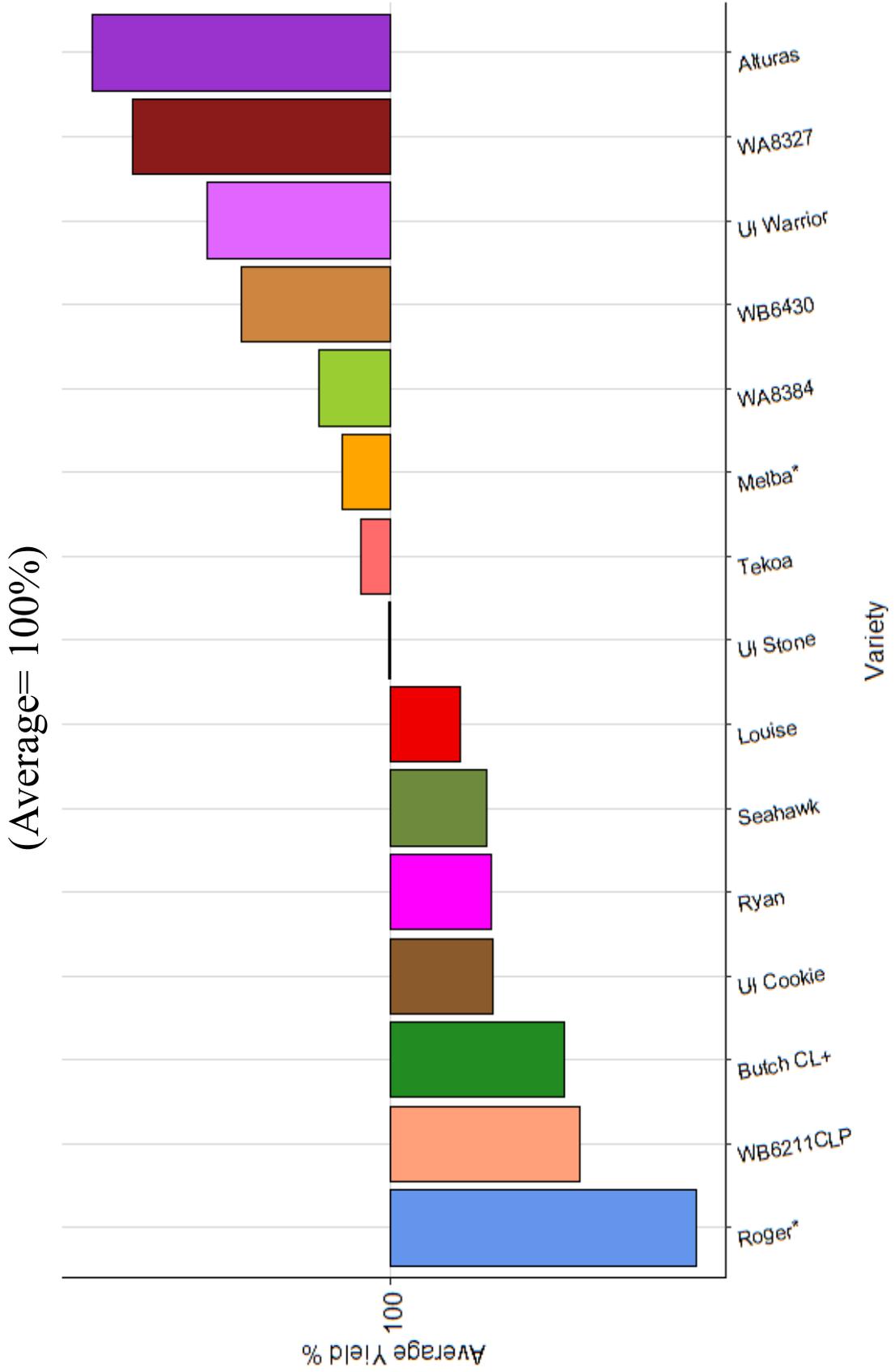


Table 51. Spring Malt Barley Irrigated Nurseries, 3-Year Averages (2022-2024; 12 site-years).

Variety	Yield (bu/A)*	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	>6/64	Plump >5.5/64	% Thin
Esma	152	50.9	100	6/28	33	18	10.8	95.5	3.0	1.9
LCS Odyssey	140	49.6	100	6/30	32	19	10.7	94.0	4.1	2.3
GemCraft	137	50.2	100	6/29	36	26	11.0	93.1	4.3	2.6
Moravian 179	136	51.0	99	7/1	33	6	11.6	96.7	2.3	1.4
ABI Raptor	133	50.1	99	6/27	36	14	10.9	95.7	2.2	1.8
Moravian 69	132	50.2	100	7/1	32	18	11.0	93.3	4.6	2.6
LCS Diablo	132	48.3	100	7/2	32	17	10.4	93.9	4.0	2.3
LCS Genie	131	51.0	100	7/1	32	12	10.6	94.3	3.7	2.4
2IM17-2221	131	50.5	100	6/29	36	14	11.2	96.0	2.5	1.6
ABI Eagle	129	50.6	98	6/30	36	13	11.3	94.1	4.0	2.0
CDC Copeland	127	51.1	100	6/30	42	24	10.9	95.1	3.2	2.2
ABI Voyager	122	50.9	98	6/28	38	19	11.7	97.2	1.6	1.3
Average	133	50.4	99	6/30	35	17	11.0	94.9	3.3	2.0
LSD ($\alpha=.05$)	6	0.4	1	0.4	1	9	0.5	2	1	1
CV (%)	11.2	1.8	2	0.5	7	127	5.3	2.2	35.9	48.4

* Variety or selection in bold (Esma) is statistically greater in yield from the other varieties.

Table 52. Spring Malt Barley Dryland Nurseries, 3-Year Averages (2022-2024; 3 site-years).

Variety or Selection	Yield (bu/A)*	Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Protein (%)	>6/64	Plump >5.5/64	% Thin
GemCraft	49	49.1	100	7/17	23	10.4	77.2	13.7	8.8
Esma	47	50.9	100	7/16	24	10.2	89.2	7.0	3.9
CDC Copeland	43	49.4	99	7/18	28	11.1	90.8	5.8	3.0
Moravian 69	40	48.7	99	7/19	23	10.8	78.1	13.6	8.2
ABI Voyager	38	50.7	98	7/18	25	11.5	91.9	4.0	2.3
Moravian 179	36	50.0	99	7/19	22	11.6	87.0	8.3	4.6
Average	42	49.7	99	7/18	24	10.9	85.7	8.8	5.1
LSD ($\alpha=.05$)	5	1	3	1	2	1	12	8	6
CV (%)	13.1	1.6	3.2	0.5	8	6.3	7.8	48.4	60.0

* Varieties or selections in bold are statistically different (greater in yield) from the other varieties.

No lodging to report.

Table 53. Irrigated Spring Malt Barley Data Combined from Aberdeen, Idaho Falls, Rupert and Tetonia, 2024.

Variety or Selection	Yield	Test Wt	Spring	Heading	Height	Lodging	Protein	Plump		
	(bu/A)*	(lb/bu)	Stand %	Date	(in.)	(%)	(%)	>6/64	>5.5/64	% Thin
Esma	143	52.9	100	6/29	32	8	10.2	97.3	1.7	1.2
Moravian 69	135	51.9	100	6/30	33	1	10.4	95.5	3.1	1.9
LCS Odyssey	134	51.4	100	7/1	33	0	10.0	95.5	2.9	1.6
17ARS072-5	132	52.0	100	7/1	36	3	9.9	95.0	3.1	2.3
GemCraft	132	51.7	100	6/29	36	9	10.4	94.0	3.8	2.3
Moravian 179	130	52.6	100	6/30	33	0	10.9	96.9	1.9	1.4
17ARS069-1	130	53.1	100	6/28	37	1	11.4	96.9	2.2	1.6
16ARS067-13	127	52.2	100	7/1	32	1	9.9	95.2	3.2	1.9
LCS Genie	124	52.7	100	7/1	32	0	10.5	94.9	3.3	1.8
LCS Diablo	123	50.3	100	7/3	32	0	10.4	95.5	3.0	1.7
ABI Raptor	122	51.3	100	6/28	37	0	10.4	95.7	2.4	1.7
2IM17-2221	119	52.3	100	6/30	37	0	10.6	96.6	2.2	1.3
CDC Copeland	117	52.7	100	6/30	42	3	10.1	96.9	1.8	1.4
CDC Fraser	116	51.4	100	6/28	39	2	10.2	96.5	2.3	1.1
ABI Eagle	110	52.2	97	7/1	36	1	10.3	94.4	3.5	1.9
ABI Voyager	103	52.3	97	6/29	39	1	10.9	97.3	1.5	1.1
AAC Connect	102	52.6	98	6/29	38	0	11.0	96.6	1.9	1.2
AAC Prairie	92	53.0	100	6/30	37	8	11.1	96.4	2.0	1.3
Average	122	52.1	99	6/30	35	2	10.5	95.9	2.5	1.6
LSD ($\alpha=.05$)	10	0.5	1.1	1	2	7	0.9	2	1	0.9
CV (%)	11.1	1.3	1.5	0.5	6.2	463	6.2	1.5	33.7	40.0

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

Table 54. Agronomic Data for Two-rowed Malt Barley at Rupert, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt (lb/bu)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*						>6/64	>5.5/64	% Thin
Esma	152	162	129	52.2	6/23	34	31	11.1	95.6	2.8	2.2
LCS Slovan	---	---	127	51.3	6/26	35	1	10.1	94.6	3.6	2.3
CDC Fraser	---	---	122	50.9	6/23	41	5	10.7	96.8	2.1	1.2
17ARS072-5	---	150	122	50.7	6/25	37	10	10.0	93.4	3.8	3.1
GemCraft	132	158	120	49.7	6/23	38	21	13.0	87.4	7.4	5.6
BC Leandra	135	159	118	50.7	6/25	33	0	10.2	96.1	2.5	1.4
Moravian 179	131	131	118	52.0	6/24	35	0	11.9	96.8	2.3	1.4
LGBU17-1320A	---	153	117	47.9	6/25	34	50	10.8	89.7	5.3	4.3
17ARS069-1	---	144	117	51.5	6/21	39	4	11.8	95.7	3.2	2.4
Moravian 69	120	133	115	51.3	6/26	33	4	10.5	93.9	4	2.9
2IM17-2221	134	157	113	51.5	6/22	37	0	10.6	96.2	2.1	1.5
LCS Odyssey	129	160	113	50.7	6/24	35	1	11.2	95.8	3.1	1.6
LCS Diablo	119	166	112	49.4	6/26	34	0	11.5	96.1	3.1	1.7
16ARS067-13	---	154	112	51.7	6/26	34	5	9.9	96	2.9	1.9
BC Elinor	---	---	109	49.4	6/24	33	13	9.6	94.3	3.8	2.3
ABI Raptor	---	152	109	49.8	6/22	37	0	10.3	93.9	3.7	2.4
C15-314-181-001	---	---	107	51.6	6/25	33	1	11.2	96.5	1.8	1.2
LCS Genie	118	134	105	51.4	6/26	34	1	12.9	93.8	4.5	2.5
CDC Copeland	133	142	103	52.0	6/23	43	11	10.4	96.7	2	1.6
AAC Connect	---	---	103	52.3	6/23	40	0	11.6	97.1	1.5	0.9
Dh131756	---	---	103	51.0	6/29	33	1	9.7	96.6	2.5	1.1
ABI Voyager	140	129	100	51.7	6/23	41	3	10.9	97.1	1.5	1.2
ABI Eagle	150	137	95	51.0	6/24	35	0	10.3	93.8	3.7	2
Average	131	148	113	50.9	6/24	35	7	10.9	95.0	3.2	2.1
LSD ($\alpha=.05$)	20	25	16	1	2	4	25	---	---	---	---
CV (%)	10.7	12.0	9.6	1.6	0.8	8.1	255	---	---	---	---

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

All plots had full stand.

Table 55. Agronomic Data for Two-rowed Malt Barley at Aberdeen, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt (lb/bu)	Spring Stand %	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*							>6/64	>5.5/64	% Thin
LGBU17-1320A	---	---	171	49.8	100	6/22	36	0	10.0	95.9	2.7	1.5
LCS Odyssey	135	160	159	51.9	100	6/22	34	0	10.8	96.7	1.6	0.8
BC Leandra	142	160	158	52.0	100	6/21	39	1	10.6	99.0	1.4	0.7
Esma	131	173	157	53.0	100	6/21	33	0	11.1	97.7	1.4	0.8
LCS Sloan	---	---	157	52.2	100	6/20	39	0	10.8	97.4	1.3	0.9
BC Elinor	134	---	156	51.0	100	6/23	37	0	10.3	97.4	2.5	0.8
Moravian 179	123	148	154	53.1	100	6/22	34	0	12.0	97.8	0.9	0.9
C15-314-181-001	---	---	152	53.4	100	6/22	35	0	12.0	98.8	0.5	1
16ARS067-13	---	169	148	51.9	100	6/22	33	0	11.7	92.5	4.9	2.6
Moravian 69	150	146	148	52.0	100	6/17	35	1	11.4	95	3.6	1.7
LCS Genie	144	144	147	52.7	100	6/21	32	0	11.1	95.1	2.7	1.3
GemCraft	145	149	145	52.3	100	6/21	40	11	11.2	95.4	2.8	1.2
LCS Diablo	128	147	142	50.2	100	6/28	33	0	10.9	96.2	2.2	1
17ARS072-5	---	146	140	52.4	100	6/20	38	1	11.9	95.8	2.8	1.5
DH131756	---	---	136	52.9	100	6/26	34	1	12.4	97.5	2	1.4
17ARS069-1	---	146	135	53.5	100	6/21	37	0	12.2	98.1	1.1	0.9
2IM17-2221	124	141	128	52.2	100	6/22	38	0	12.1	97.1	2.1	1.1
ABI Raptor	---	137	128	51.6	100	6/21	41	0	12.3	97.2	2.2	1.1
CDC Copeland	128	131	124	53.4	100	6/21	45	0	11.0	97.6	1.3	1.1
CDC Fraser	---	---	124	52.0	98	6/18	41	1	12.0	97.4	1.8	0.9
ABI Eagle	119	137	123	52.4	100	6/22	38	0	12.3	95.5	2.9	1.9
AAC Connect	106	---	112	52.9	100	6/18	37	1	12.5	97.0	1.9	1.2
ABI Voyager	110	142	110	52.2	100	6/20	37	3	12.9	98.1	1.5	1
AAC Prairie	---	129	95	53.3	100	6/18	37	0	12.8	95.8	2.8	1.5
Average	127	139	139	52.3	100	6/21	37	1	11.6	96.8	2.1	1.2
LSD ($\alpha=.05$)	16	15	15	0.8	1	2	3	5	---	---	---	---
CV (%)	8.8	7.2	7.9	1.1	0.7	0.7	6.7	521	---	---	---	---

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

Table 56. Agronomic Data for Two-rowed Malt Barley at Idaho Falls, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*							>6/64	>5.5/64	% Thin
17ARS072-5	---	153	148	51.8	100	7/1	36	0	9.8	94.3	3.0	2.8
LGBU17-1320A	---	145	148	48.3	100	7/2	32	0	9.5	94.6	3.5	2.0
GemCraft	128	148	147	52.0	100	6/30	35	4	9.3	96.8	2.5	1.0
Esma	159	170	146	52.5	100	6/30	30	0	9.7	98.4	1.4	0.7
BC Elinor	---	---	145	49.9	100	7/1	32	0	9.6	95.9	2.9	1.7
BC Leandra	127	169	145	50.9	100	7/2	30	0	9.2	96.1	2.6	1.4
16ARS067-13	---	161	144	52.2	100	7/2	32	0	9.7	96.0	2.4	1.4
CDC Copeland	116	151	141	52.5	100	7/1	46	0	10.4	96.7	1.9	1.6
17ARS069-1	---	154	138	52.9	100	6/27	37	0	11.2	96.1	2.1	1.8
LCS Odyssey	131	144	138	51.1	100	7/2	30	0	9.2	95.9	2.5	1.6
ABI Raptor	---	154	136	51.5	100	6/27	36	0	10.0	96.6	1.6	1.7
2IM17-2221	121	151	134	52.0	100	7/1	36	0	10.4	96.6	1.9	1.5
Moravian 69	129	143	131	51.2	100	7/2	31	0	10.0	95.9	2.3	1.7
CDC Fraser*	---	---	131	51.4	100	6/29	39	0	10.0	96.6	1.9	1.2
ABI Eagle	120	160	129	52.0	99	7/1	37	3	10.3	95.5	2.5	1.6
LCS Genie	126	148	128	52.6	100	7/2	31	0	9.7	95.4	2.7	1.8
LCS Diablo	136	150	126	49.2	100	7/2	33	0	9.9	95.0	3.1	1.7
C15-314-181-001	---	---	125	52.4	100	6/30	31	0	10.7	97.4	1.4	1.1
Moravian 179	143	155	122	51.9	100	7/1	31	0	10.8	96.1	2.0	1.7
ABI Voyager	128	143	118	52.2	98	6/30	40	0	10.8	97.7	1.6	0.8
AAC Connect	---	159	111	52.3	99	6/30	38	0	10.8	96.1	2.1	1.5
AAC Prairie	---	151	108	52.6	100	6/28	39	23	11.0	96.2	2.0	1.5
Average	128	152	132	51.6	100	6/30	34	1	10.1	96.2	2.3	1.5
LSD ($\alpha=0.05$)	15	17	12	1	1	1	3	10	---	---	---	---
CV (%)	8.3	8.1	6.5	0.9	1.0	0.4	6.0	571	---	---	---	---

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

Table 57. Agronomic Data for Two-rowed Malt Barley at Tetonia, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*							>6/64	>5.5/64	% Thin
Moravian 69	140	128	148	53.2	100	7/17	32	0	9.7	97.3	2.4	1.2
Esma	158	144	133	53.8	100	7/13	30	0	8.9	97.6	1.1	1.1
17ARS069-1	---	135	129	54.5	100	7/13	35	0	10.5	97.6	2.3	1.2
LCS Odyssey	145	139	127	52.0	100	7/15	31	0	8.8	93.4	4.5	2.4
Moravian 179	156	128	127	53.3	100	7/15	31	0	8.9	97.0	2.3	1.4
17ARS072-5	---	140	118	53.3	100	7/16	33	0	7.9	96.5	2.7	1.8
GemCraft	154	132	117	52.7	100	7/14	33	0	7.9	96.3	2.5	1.2
LCS Genie	145	120	116	54.3	100	7/16	32	0	8.3	95.3	3.3	1.7
ABI Raptor	---	134	113	52.0	100	7/13	33	0	9.0	95.2	2.2	1.5
LCS Diablo	145	125	111	52.5	100	7/16	29	0	9.1	94.5	3.4	2.4
16ARS067-13	---	144	104	53.1	100	7/17	31	0	8.1	96.4	2.6	1.7
2IM17-2221	142	125	101	53.4	99	7/16	34	0	9.1	96.3	2.6	1.2
CDC Copeland	130	124	100	52.8	100	7/15	36	0	8.5	96.4	2.0	1.1
CDC Fraser	---	---	90	51.1	100	7/14	35	3	8.2	95.2	3.4	1.2
ABI Eagle	146	131	89	53.1	90	7/16	33	0	8.2	92.6	4.9	1.9
ABI Voyager	134	123	84	52.8	91	7/13	37	0	9.1	96.3	1.5	1.2
AAC Connect	---	---	84	52.8	94	7/14	35	0	9.2	96.2	1.9	1.3
AAC Prairie	---	124	76	53.5	100	7/13	36	0	9.4	97.3	1.2	0.9
Average	144	131	109	53.0	99	7/15	33	0.1	8.8	96.0	2.6	1.5
LSD ($\alpha=.05$)	14	17	28	1	4	1	4	2	---	---	---	---
CV (%)	6.9	9.4	18.2	1.5	2.7	0.4	8.4	849	---	---	---	---

*Varieties or selections in bold are not statistically different from the top yielding variety. Yield corrected to 12 % moisture.

Table 58. Agronomic Data for Two-row Spring Malt Barley at Soda Springs, Dryland, 2024.

Variety or Selection	Yield (bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)	Plump		
	2022	2023	2024*						>6/64	>5.5/64	% Thin
LGBU17-1320A	---	---	37	50.0	100	7/21	23	8.3	77.3	11.6	10.5
17ARS072-5	---	66	34	49.4	99	7/21	20	7.8	62.4	20.7	16.0
LCS Odyssey	---	---	33	50.9	100	7/20	22	8.6	76.8	13.8	8.6
GemCraft	43	64	33	48.1	100	7/19	21	8.2	54.9	25.6	18.3
17ARS069-1	---	53	32	49.1	96	7/18	24	8.7	56.8	24.1	19.0
CDC Copeland	35	56	31	48.7	98	7/20	26	9.7	81.3	10.6	6.4
Esmā	48	65	28	51.1	100	7/17	23	8.4	84.4	7.8	6.6
Moravian 69	36	56	28	46.9	96	7/20	22	8.9	59.0	23.1	17.2
16ARS067-13	---	53	27	49.0	98	7/20	22	9.2	73.6	16.0	10.1
CDC Fraser	---	---	25	48.3	100	7/17	21	9.2	70.2	16.5	11.8
Moravian 179	38	46	25	49.6	98	7/20	22	9.5	77.2	13.7	8.2
AAC Connect	---	---	25	49.9	95	7/20	22	11.0	72.5	14.3	11.6
2IM16-0154	---	---	24	47.9	98	7/15	22	8.5	64.8	19.2	15.6
ABI Voyager	42	49	23	49.8	95	7/20	23	11.0	83.9	6.0	4.3
AAC Prairie	---	54	19	48.9	98	7/18	27	10.3	63.1	18.8	16.6
AVERAGE	43	55	28	49.8	98	7/18	22	9.4	70.5	16.1	12.1
LSD ($\alpha=0.05$)	8	7	8	1.8	6	1.5	1	---	---	---	---
CV (%)	11.7	8.3	19.9	2.5	4.5	0.5	4.6	---	---	---	---

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

No lodging to report.

Table 59. 2-Row Spring Malt Barley Yield Percentage of Location Averages, 2024.**(100% = Average)**

Variety or Selection	Aberdeen	Rupert	Idaho Falls	Tetonia	Soda Springs	Variety Average
LGBU17-1320A	123	104	111	---	131	117
Esma	113	114	110	122	---	115
LCS Slovan	113	112	---	---	---	112
LCS Odyssey	114	100	104	116	119	111
17ARS072-5	101	108	112	108	121	110
BC Leandra	114	104	109	---	---	109
GemCraft	104	106	111	107	117	109
Moravian 69	106	102	99	136	99	108
17ARS069-1	97	103	104	118	115	108
BC Elinor	112	97	109	---	---	106
Moravian 179	111	104	92	116	89	102
16ARS067-13	106	99	109	95	97	101
LCS Genie	106	93	96	106	---	100
LG Diablo	102	99	95	101	---	99
C15-314-181-001	109	95	94	---	---	99
ABI Raptor	92	96	103	104	---	99
CDC Copeland	89	91	107	92	112	98
2IM17-2221	92	100	101	92	---	96
DH131756	97	91	---	---	---	94
CDC Fraser	89	108	99	82	91	94
ABI Eagle	88	84	97	82	---	88
AAC Connect	81	91	84	77	88	84
ABI Voyager	79	88	89	77	81	83
AAC Prairie	68	---	82	69	68	72
2IM16-0154	---	0	---	---	84	42
Location Average (bu/A)	139	113	132	109	28	

Chart 7. 2024 2-Row Spring Malt Barley Yield Percentages Across All Locations

(Average = 100%)

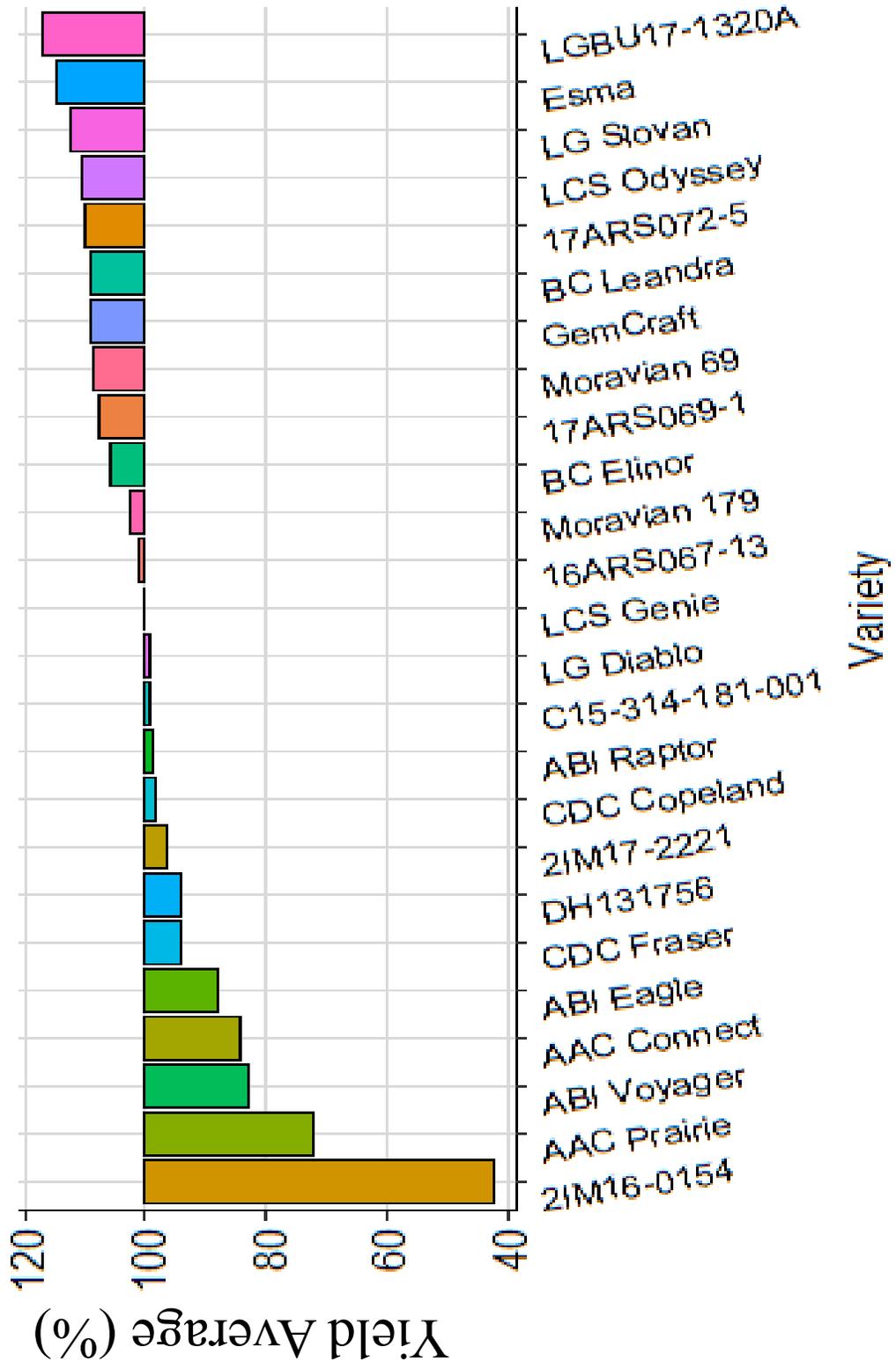


Table 60. 2-Row Spring Feed Barley Irrigated Nurseries, 3-Year Averages (2022-2024; 12 site-years)

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
2-Row Spring Feed Barley										
Altorado	145	52.3	100	6/28	37	12	11.5	91.6	5.4	2.8
Claymore	142	50.7	100	6/28	39	20	11.2	91.7	5.3	3.1
HO516-429	140	51.7	100	6/29	40	19	11.3	93.8	4.1	2.6
Champion	133	51.9	100	6/27	39	22	11.7	91.8	5.1	3.0
Feed Average	140	51.7	100	6/28	39	18	11.4	92.2	5.0	2.8
2-Row Spring Food Barley										
Kardia	129	50.0	100	7/1	39	28	12.3	87.7	8.1	4.6
Goldenhart**	87	58.5	95	7/1	37	22	13.4	84.2	11.3	4.9
Transit**	86	56.8	99	7/1	40	15	13.8	81.1	13.9	5.1
Food Average	101	55.1	98	7/1	39	22	13.2	84.3	11.1	4.9
LSD ($\alpha=0.05$)	6	0.3	1	0.4	1	8	1	4	3	1
CV (%)	11.3	1.6	2.8	0.6	5.7	97	8.1	5.3	50.7	34.7

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

** Indicates hullless variety.

Table 61. 2-Row Spring Feed Barley Dryland Nurseries, 3-Year Averages (2022-2024; 3 site-years)

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)	Plump >6/64	Plump >5.5/64	% Thin
2-Row Spring Feed Barley									
Champion	50	51.4	100	7/16	27	11.3	84.3	10.7	5.0
Altorado	49	51.2	100	7/16	25	10.6	80.9	13.1	5.9
Claymore	49	49.8	99	7/15	26	11.0	78.0	11.6	10.4
HO516-429	47	50.8	99	7/15	28	11.5	89.3	6.6	4.6
Feed Average	49	50.8	99	7/16	26	11.1	83.1	10.5	6.5
2-Row Spring Food Barley									
Kardia	38	50.0	98	7/19	25	13.2	89.8	7.5	3.2
Goldenhart**	27	58.3	86	7/20	22	14.6	60.5	22.0	17.5
Food Average	33	54.1	92	7/19	24	13.9	75.2	14.8	10.3
LSD ($\alpha=.05$)	4	1	5	1	1	1	14	6	12
CV (%)	12.1	2.7	5.9	0.5	5.5	5.7	9.8	28.4	82.1

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

** Indicates hullless variety.

No lodging to report.

Table 62. Irrigated 2-Row Spring Feed and Food Barley Data Combined from Aberdeen, Rupert, Idaho Falls and Teton, 2024.

Variety or Selection	Yield (bu/A)*	Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump >6/64	Plump >5.5/64	% Thin
2-Row Spring Feed Barley										
Carleton	137	52.2	100	6/27	37	2	9.8	92.3	4.7	2.4
Claymore	134	52.1	100	6/28	38	3	10.1	93.8	4.0	2.0
Altorado	130	53.4	100	6/28	36	2	10.8	92.0	5.5	1.9
Champion	128	53.4	100	6/27	40	5	11.3	93.6	3.9	2.0
HO516-429	121	53.7	100	6/28	42	3	10.7	96.6	2.3	1.3
Rulon (SB6)	119	50.0	100	6/24	39	2	10.8	95.9	2.6	1.5
Successor	107	53.5	100	6/24	33	2	10.8	96.0	2.6	1.6
Feed Average	125	53	100	6/26	38	3	10.6	94.3	3.7	1.8
2-Row Spring Food Barley										
Kardia	127	51.0	100	7/1	38	7	11.0	90.5	6.5	2.9
HO517-126	106	60.6	100	6/29	36	2	10.9	74.5	19.8	6.1
18ARS205-2	97	58.6	99	6/30	40	20	8.9	85.3	10.0	5.1
16ARS295-1	90	58.1	99	6/27	35	2	12.8	78.8	13.0	8.4
Goldenhart	90	59.8	99	6/30	37	11	12.7	84.2	11.9	3.9
Transit	76	57.2	98	6/30	40	3	13.0	79.6	15.9	4.2
Food Average	98	57.5	99	6/29	38	8	11.6	82.1	12.8	5.1
LSD ($\alpha=.05$)	9	0.5	1	1	2	6	2	7	6	3
CV (%)	11.2	1.2	1.2	0.5	6.2	187	14.1	5.8	51.8	57.7

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

** Indicates hullless variety.

SB6 = Six-rowed barley

Table 63. Agronomic Data for Spring Feed and Food Barley, Rupert, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt. (lb/bu)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*						>6/64	>5.5/64	% Thin
2-Row Spring Feed Barley											
Carleton	---	155	126	51.9	6/21	37	0	10.0	93.1	4.4	2.6
Claymore	157	167	121	50.8	6/22	40	1	10.5	92.2	5.4	2.9
Altorado	142	166	115	53.3	6/22	37	0	11.0	91.2	5.8	3.0
Champion	120	159	107	52.6	6/21	42	1	11.5	91.7	5.3	3.2
Rulon (SB6)	---	---	99	48.5	6/19	42	0	11.1	95.3	3.5	2.0
HO516-429	126	169	97	53.3	6/22	44	0	10.9	95.9	3.3	1.7
Successor	---	---	93	52.6	6/19	36	0	11.5	94.9	3.8	2.4
Feed Average	127	160	108	51.9	6/21	40	0.3	10.9	93.5	4.5	2.5
2-Row Spring Food Barley											
Kardia	98	160	105	49.3	6/26	39	0	10.7	86.5	9.2	5.2
HO517-126**	107	128	85	58.4	6/24	37	0	11.5	60.2	31.4	9.4
Goldenhart**	62	93	75	57.7	6/24	37	14	13.0	78.7	16.5	5.7
16ARS295-1**	---	---	72	54.8	6/21	38	0	12.9	62.0	20.4	18.7
18ARS205-2	---	---	72	56.4	6/24	40	31	1.2	78.0	15.2	7.9
Transit**	80	106	56	56.3	6/23	41	0	13.0	62.4	32.5	5.7
Food Average	80	104	77	55.5	176	38	8	10.4	71.3	20.9	8.8
LSD ($\alpha=.05$)	23	16	17	1	2	3	17	---	---	---	---
CV (%)	12.8	9.0	12.1	1.6	0.7	6.1	326	---	---	---	---

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

** Indicates hullless variety.

*** All plots had full stand.

SB6 = six-rowed barley.

Table 64. Agronomic Data for Spring Feed and Food Barley, Aberdeen, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*							>6/64	>5.5/64	% Thin
2-Row Spring Feed Barley												
Rulon (SB6)	---	---	141	51.0	100	6/18	41	0	12.3	97.6	1.7	1.0
Claymore	140	157	139	52.0	100	6/20	43	0	11.7	94.9	3.3	1.8
Carleton	---	164	138	52.2	100	6/19	40	0	11.8	93.1	4.9	1.7
Successor	---	---	138	54.3	100	6/19	35	0	12.6	98.3	1.3	0.8
Champion	120	162	135	53.5	100	6/19	43	9	12.7	96.2	2.4	1.1
HO516-429	139	173	135	53.8	100	6/21	44	0	12.3	98.2	1.6	1.0
Altorado	140	176	134	53.2	100	6/19	38	0	13.3	94.9	3.3	1.2
Feed Average	131	162	137	52.8	99	6/21	40	44	12.4	96.2	2.6	1.2
2-Row Spring Food Barley												
Kardia	122	139	135	51.2	100	6/21	41	6	14.1	90.3	7.4	2.6
HO517-126**	96	133	129	61.4	100	6/21	40	0	13.1	90.3	6.7	3.3
18ARS205-2	---	---	114	59.6	100	6/21	43	0	14.2	88.5	7.1	5
16ARS295-1**	---	104	104	59.7	100	6/21	37	0	14.8	88.5	7.4	4.3
Goldenhart**	81	98	101	60.5	100	6/21	38	0	15.2	90.9	6.2	3.3
Transit**	94	98	82	57.2	99	6/21	44	0	16.3	81.2	13.6	5.1
Food Average	97	101	111	58.3	80	6/26	37	10	14.6	88.3	8.1	3.9
LSD ($\alpha=.05$)	18	18	20	1	1	1	3	9	---	---	---	---
CV (%)	10.0	10.4	11.4	1.2	0.7	0.5	5.0	524	---	---	---	---

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

** Indicates hullless variety.

SB6 = six-rowed barley.

Table 65. Agronomic Data for Spring Feed and Food Barley at Idaho Falls, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*							>6/64	>5.5/64	% Thin
2-Row Spring Feed Barley												
Claymore	138	162	144	51.6	100	6/27	39	10	9.2	93.0	3.9	2.4
Altorado	154	162	142	52.7	100	6/27	36	9	10.0	92.5	4.9	1.9
Carleton	---	133	139	51.3	100	6/26	36	8	8.5	89.3	6.0	4.0
Champion	133	157	137	53.1	100	6/26	40	10	10.7	93.3	4.3	1.9
Rulon(SB6)	---	---	135	49.2	100	6/20	38	9	9.6	95.1	2.5	1.3
HO516-429	128	165	130	53.4	100	6/27	41	10	9.7	95.5	2.5	1.5
Successor	---	---	99	53.1	100	6/19	30	8	10.2	95.0	2.8	2.1
Feed Average	131	147	132	52.0	100	6/25	37	9	9.7	93.4	3.8	2.2
2-Row Spring Food Barley												
Kardia	113	138	140	51.2	100	7/1	37	8	9.6	92.9	4.2	1.7
HO517-126**	---	138	114	60.4	100	6/29	35	9	9.8	75.7	18.4	5.7
18ARS205-2	---	---	108	57.5	99	6/30	40	48	10.5	87.5	8.3	3.9
16ARS295-1**	---	112	94	57.7	98	6/27	34	9	11.6	78.8	14.0	6.8
Goldenhart**	80	100	92	59.3	96	6/29	37	25	11.9	85.7	10.9	2.5
Transit**	76	118	84	57.0	96	7/1	38	11	11.7	85.2	10.2	3.4
Food Average	91	121	105	57.2	98	6/29	37	18	10.9	84.3	11.0	4.0
LSD ($\alpha=.05$)	15	24	11	0.8	2	1.1	4	16	---	---	---	---
CV (%)	8.6	12.4	6.5	1.0	1.7	0.4	6.8	83	---	---	---	---

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

** Indicates hulless variety.

SB6 = six-rowed barley.

Table 66. Agronomic Data for Spring Feed and Food Barley at Tetonia, Irrigated, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Lodging (%)	Protein (%)	Plump		
	2022	2023	2024*							(> 6/64)	(5.5/64)	% Thin
2-Row Spring Feed Barley												
Carleton	---	104	143	53.6	100	7/11	34	0	8.9	93.5	3.6	1.4
Claymore	152	114	130	54.3	100	7/14	33	0	9.1	94.9	3.4	1
Champion	147	92	127	52.4	100	7/12	36	0	10.2	93.1	3.5	1.6
Altorado	148	114	125	53.3	100	7/14	33	0	8.9	89.4	7.8	1.6
HO516-429	164	122	121	54.4	100	7/12	39	1	9.8	96.7	1.7	1
Rulon(SB6)	---	---	103	62.3	100	7/9	38	0	10.3	95.6	2.8	1.5
Successor	---	---	101	54.3	100	7/8	30	0	9.0	95.9	2.5	1.1
Feed Average	147	108	121	54.9	100	7/11	34	0.2	9.5	94.2	3.6	1.3
2-Row Spring Food Barley												
Kardia	142	122	128	54.1	100	7/15	37	15	9.7	92.4	5.2	2.0
HO517-126**	---	---	96	58.2	96	7/13	34	0	9.1	71.8	22.7	5.8
18ARS205-2**	---	---	94	61.8	99	7/15	37	0	9.8	87.1	9.3	3.6
16ARS295-1**	---	71	91	60.1	96	7/12	31	0	11.8	85.7	10.2	3.7
Goldenhart**	98	78	90	51.6	100	7/15	35	6	10.8	81.4	13.8	4.1
Transit**	100	83	82	61.0	99	7/15	39	0	10.9	89.7	7.4	2.4
Food Average	112	87	97	57.8	98	7/14	35	4	10.4	84.7	11.4	3.6
LSD ($\alpha=.05$)	13	23	22	0.7	2	1	3	9	---	---	---	---
CV (%)	6.7	15.8	14.1	0.9	1.4	0.4	6.8	374	---	---	---	---

* Varieties or selections in bold are not statistically different from the top yielding variety. Yield corrected at 12% moisture

** Indicates hullless variety.

SB6 = six-rowed barley.

Table 67. Agronomic Data for Spring Feed and Food Barley at Soda Springs, Dryland, 2024.

Variety or Selection	Yield (Bu/A)			Test Wt. (lb/bu)	Spring Stand (%)	Heading Date	Height (in.)	Protein (%)	Plump		
	2022	2023	2024*						(> 6/64)	(5.5/64)	% Thin
2-Row Spring Feed Barley											
Altorado	47	58	41	50.5	100	7/19	22	8.9	60.1	24.7	13.7
Champion	54	56	40	50.8	100	7/18	26	9.8	68.7	19.4	10.5
Claymore	53	56	35	50.5	98	7/17	23	9.9	52.2	21.3	25.4
HO516-429	49	60	32	50.5	98	7/16	26	10.2	75.9	12.9	10.3
Rulon (SB6)	---	---	32	49.4	99	7/13	23	10.1	84.1	8.8	6.6
Carleton	---	65	26	46.9	90	7/15	20	9.8	47.6	24.1	26.9
Successor	---	---	19	49.4	99	7/11	19	10.1	61.1	19.5	18.6
Feed Average	48	59	32	49.7	98	7/16	23	9.8	64.2	18.7	16.0
2-Row Spring Food Barley											
HO517-126**	---	---	33	54.7	96	7/19	24	10.5	32.8	31.6	34.7
16ARS295-1**	---	51	22	52.9	98	7/19	20	11.4	27	28	44
Kardia	37	58	21	49.5	95	7/21	23	12	77.9	14.7	6.7
18ARS205-2**	---	---	16	52.5	95	7/21	23	11.7	25	32	42
Goldenhart**	36	31	14	54.7	95	7/21	20	12.5	28.0	30.7	39.9
Food Average	35	43	21	52.9	96	7/20	22	11.5	38.1	27.4	33.6
LSD ($\alpha=.05$)	9	9	9	4	8	3	2	---	---	---	---
CV (%)	14.0	12.2	21.9	5.4	5.5	1.1	6.3	---	---	---	---

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

** Indicates hullless variety.

SB6 = six-rowed barley.

No lodging to report.

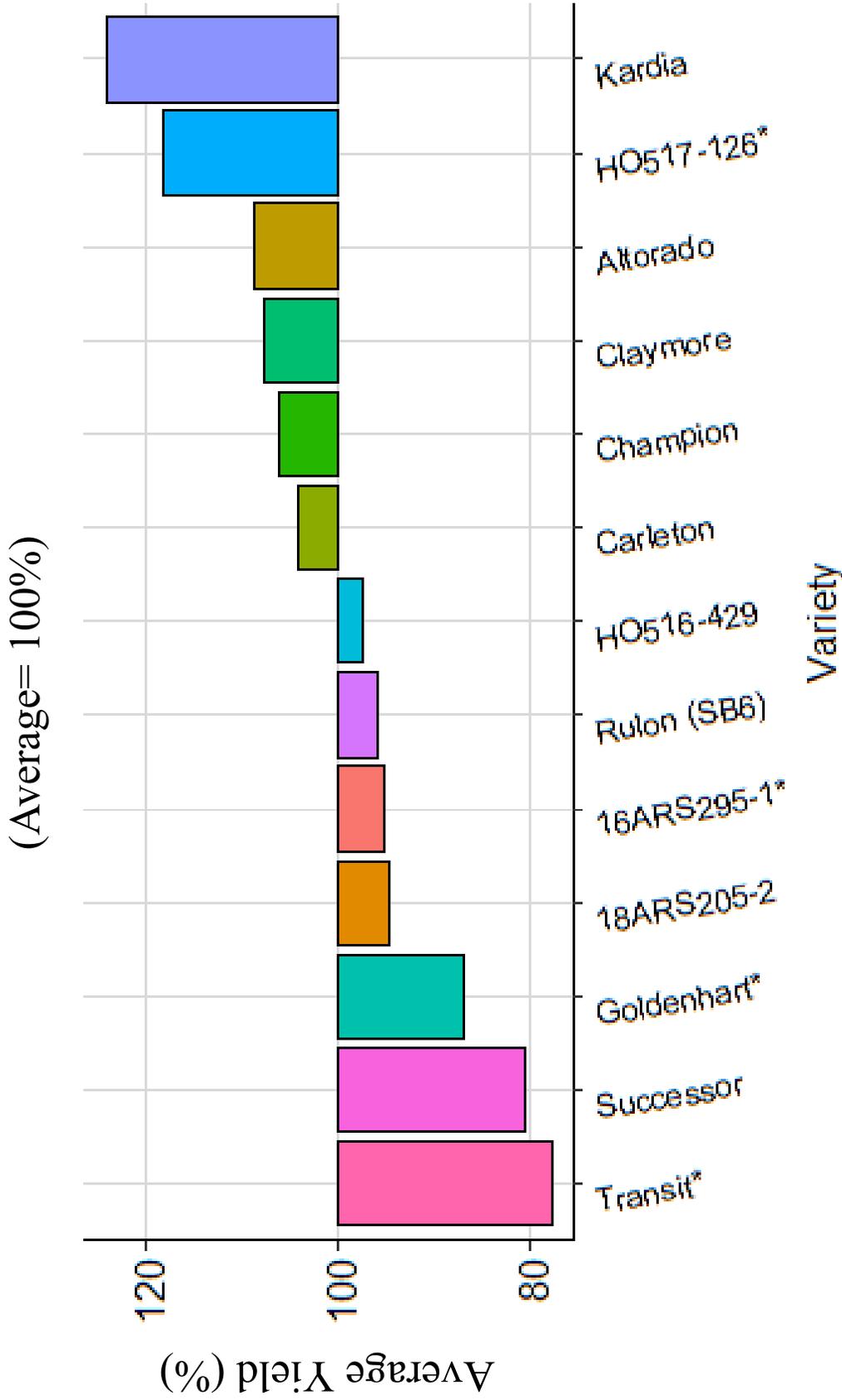
Table 68. 2-Row Spring Feed and Food Barley Yield Percentage of Location Averages, 2024.

(100% = Average)						
Variety or Selection	Aberdeen	Rupert	Idaho Falls	Tetonia	Soda Springs	Variety average
Altorado	98	106	107	103	130	109
Claymore	101	112	109	107	110	108
Champion	99	99	103	105	125	106
Carleton	101	116	105	118	81	104
HO516-429	99	89	99	99	101	97
Rulon (SB6)	103	91	102	85	98	96
Successor	100	86	75	83	59	81
Feed Barley						
Location Average (bu/A)	137	108	132	121	32	
Food Barley						
Kardia	122	136	133	132	98	124
HO517-126**	116	109	108	99	158	118
16ARS295-1**	94	93	89	94.0	106	95
18ARS205-2	103	93	102	97	78	95
Goldenhart**	91	97	87	93	67	87
Transit**	74	72	80	85	---	78
Location Average (bu/A)	111	77	105	97	21	

* Indicates hulless varieties.

SB6 = Six-rowed barley

Chart 8. 2024 2-Row Food/Feed Barley Yield Percentages Across All Locations



* Hulless variety
 SB6 = Six-rowed barley

Table 69. Grain Protein & Kernel Hardness of Hard Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	-----Grain Protein %-----						-----Kernel Hardness 0-100-----					
	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average
Balance	15.2	12.8	15.6	---	---	14.5	76	90	91	---	---	86
Flathead	13.7	12.2	13.6	14.9	14.6	13.8	70	87	97	68	84	81
FourOsix	13.3	12.3	14.0	15.7	15.6	14.2	72	84	97	57	83	78
HSG108	13.4	11.4	---	---	---	12.4	55	76	---	---	---	65
Juniper	---	---	---	15.3	14.4	14.9	---	---	---	87	88	87
Kairos	13.6	11.6	13.6	---	---	12.9	63	74	83	---	---	73
Keldin	14.3	12.2	12.9	14.9	16.3	14.1	67	89	96	46	82	76
Keldin + 11-52-0	13.9	11.8	13.5	15.7	16.1	14.2	73	84	95	64	91	81
LCS Jet	13.8	12.1	14.0	15.0	15.3	14.0	60	100	93	52	86	78
LCS Rocket	13.1	11.7	14.1	---	---	13.0	69	87	95	---	---	84
Milestone	14.1	12.1	13.5	---	15.5	13.8	65	88	97	---	95	86
MT 2019	---	---	---	14.9	16.0	15.4	---	---	---	67	94	81
MT Warcat	---	---	---	14.9	16.3	15.6	---	---	---	73	90	82
MT1745	13.6	12.5	13.9	14.8	14.8	13.9	64	83	94	58	90	78
OR2190064R	13.2	12.2	14.7	16.1	15.6	14.4	71	80	84	50	93	76
Promontory	---	---	---	15.6	17.2	16.4	---	---	---	79	99	89
Scorpio	13.8	11.7	12.7	14.9	15.6	13.7	60	70	80	66	84	72
Sequoia	---	---	---	14.7	15.3	15.0	---	---	---	65	86	75
UI SRG	---	---	---	15.5	17.5	16.5	---	---	---	70	101	85
UT11223-10	---	---	---	13.9	14.7	14.3	---	---	---	64	84	74
UT11317-8	---	---	---	14.6	14.6	14.6	---	---	---	62	90	76
Utah-100	---	---	---	16.1	16.1	16.1	---	---	---	67	87	77
WB4303	14.0	12.2	14.1	15.0	16.3	14.3	68	91	93	83	87	84
WB4401	13.3	11.9	13.6	---	---	12.9	74	85	95	---	---	85
WB4422	14.9	12.9	14.0	14.5	15.4	14.3	77	109	110	67	93	91
WB4510CLP	13.4	11.8	13.7	14.8	15.5	13.9	77	84	95	70	92	83
Yellowstone	14.0	12.8	13.3	16.4	16.0	14.5	68	92	94	61	89	81
Apst52	13.5	12.5	13.6	---	---	13.2	61	81	81	---	---	75
Variety or Selection	-----Grain Protein %-----						-----Kernel Hardness 0-100-----					
Variety or Selection	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average
Golden Spike (W)	---	---	---	13.5	15.3	14.4	---	---	---	66	84	75
IDO2006 (W)	13.2	11.8	13.3	16.4	14.7	13.9	60	76	79	67	89	74
Irv (W)	---	---	---	16.3	15.7	16.0	---	---	---	72	82	77
Millie (W)	14.1	12.5	14.5	16.4	16.7	14.8	76	94	99	74	106	89
MT1491 (W)	---	---	---	15.0	15.4	15.2	---	---	---	74	85	79
UI Bronze Jade 1 (W)	13.4	12.8	13.4	14.8	15.1	13.9	80	88	97	54	87	81
UI Silver (W)	---	---	---	14.4	15.3	14.9	---	---	---	85	96	90
Location Average	13.8	12.2	13.8	15.2	15.6	14.4	68	86	93	67	89	80

(W) = Hard White Winter

Hard Winter Wheat

Table 70. Percent Flour Protein and Flour Yield of Hard Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Flour Protein (14% mb)						Flour Yield (%)					
	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average
Hard Red Winter Wheat												
Balance	12.87	10.36	13.09	---	---	12.1	74.8	71.8	72.6	---	---	73
Flathead	11.44	10.19	11.25	12.53	11.8	11.4	77.9	74.9	74.2	72.7	75.1	75
FourOsix	11.57	9.46	11.79	13.09	13.37	11.9	77.0	74.8	73.5	72.3	74.0	74
HSG108	10.69	8.94	---	---	---	9.8	76.3	73.8	---	---	---	75
Kairos	11.2	9.53	11.22	---	---	10.7	74.4	72.5	72.2	---	---	73
Juniper	---	---	---	13.09	12.34	12.7	---	---	---	67.6	69.4	68
Keldin	11.72	9.72	10.45	12.22	13.64	11.6	74.2	72.9	71.4	68.9	72.0	72
Keldin + 11-52-0	11.66	9.69	10.85	13.15	14.53	12.0	74.4	72.9	71.4	68.4	71.6	72
LCS Jet	11.32	9.05	10.95	11.93	12.59	11.2	74.9	71.6	70.7	70.4	70.7	72
LCS Rocket	10.64	9.26	11.81	---	---	10.6	75.1	72.7	71.3	---	---	73
Milestone	11.18	9.79	10.9	---	12.64	11.1	73.3	71.2	70.3	---	69.5	71
MT 2019	---	---	---	12.42	13.75	13.1	---	---	---	69.9	71.8	71
MT Warcat	---	---	---	12.74	13.11	12.9	---	---	---	71.4	72.7	72
MT1745	11.49	10.1	10.43	12	12.67	11.3	74.8	72.7	70.4	71.2	72.1	72
OR2190064R	11.17	9.79	12.3	13.6	12.4	11.9	74.5	72.4	69.6	69.9	67.5	71
Promontory	---	---	---	13.14	15.46	14.3	---	---	---	69.8	69.6	70
Scorpio	11.24	9.01	9.86	12.33	12.94	11.1	73.2	71.8	70.2	70.4	67.5	71
Sequoia	---	---	---	11.8	12.89	12.3	---	---	---	72.1	71.7	72
UI SRG	---	---	---	12.92	15.11	14.0	---	---	---	69.2	72.4	71
UT11223-10	---	---	---	11.16	12.07	11.6	---	---	---	66.3	70.1	68
UT11317-8	---	---	---	11.82	12.12	12.0	---	---	---	69.9	72.9	71
Utah-100	---	---	---	13.29	13.85	13.6	---	---	---	69.8	67.8	69
WB4303	10.96	9.73	11.35	12.12	13.64	11.6	72.3	69.7	69.2	66.6	68.3	69
WB4401	11.06	9.29	10.76	---	---	10.4	74.4	71.9	70.5	---	---	72
WB4422	12.25	10.19	11.55	11.46	13	11.7	73.0	69.9	69.1	67.5	70.6	70
WB4510CLP	11.12	9.37	10.98	12.82	12.43	11.3	73.9	72.5	70.3	68.5	70.8	71
Yellowstone	11.6	10.58	10.67	14.07	13.35	12.1	73.9	71.7	70.3	68.9	70.3	71
Apst52	11.6	10.11	11.18	---	---	11.0	74.0	71.8	70.3	---	---	72
Location Average	11.4	9.7	11.2	12.6	13.2	11.8	74.5	72.3	71.0	69.6	70.8	71.5
Hard White Winter Wheat												
Golden Spike (W)	---	---	---	11	13.44	12.2	---	---	---	70.4	72.4	71
IDO2006 (W)	10.53	9.06	10.44	13.56	12.16	11.2	73.6	71.7	71.6	69.7	68.2	71
Irv (W)	---	---	---	13.58	13.09	13.3	---	---	---	69.4	68.0	69
Millie (W)	11.76	9.97	12.31	13.95	14.15	12.4	73.2	70.3	69.8	68.8	70.9	71
MT1491 (W)	---	---	---	12.94	13.13	13.0	---	---	---	70.4	72.0	71
UI Bronze Jade 1 (W)	11.34	10.54	11.09	12.37	12.11	11.5	76.4	73.4	72.8	72.6	74.1	74
UI Silver (W)	---	---	---	12.09	12.64	12.4	---	---	---	69.7	74.8	72
Location Average	11.2	9.9	11.3	12.8	13.0	12.3	74	72	71	70	72	71

mb = moisture basis

Table 71. Bake Volume of Hard Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Bake Volume (cc)					Average
	Aberdeen	Kimberly	Ririe Dry	Ririe Irrig	Soda Springs	
Hard Red Winter Wheat						
Apst52	950	675	---	925	---	850
Balance	1050	900	---	975	---	975
Flathead	1050	900	1075	825	900	950
FourOsix	1075	875	1125	875	1050	1000
HSG108	800	625	---	---	---	713
Juniper	---	---	925	---	825	875
Kairos	1000	775	---	850	---	875
Keldin	925	750	875	725	1025	860
Keldin + 11-52-0	900	700	1000	775	975	870
LCS Jet	875	<600	825	800	825	831
LCS Rocket	850	675	---	925	---	817
Milestone	825	700	---	825	825	794
MT 2019	---	---	950	---	1050	1000
MT Warcat	---	---	850	---	1100	975
MT1745	900	825	1000	750	925	880
OR2190064R	825	700	875	825	675	780
Promontory	---	---	1125	---	1100	1113
Scorpio	825	700	875	725	800	785
Sequoia	---	---	950	---	850	900
UI SRG	---	---	1000	---	950	975
UT11223-10	---	---	825	---	825	825
UT11317-8	---	---	975	---	825	900
Utah-100	---	---	1100	---	875	988
WB4303	800	<600	750	650	900	775
WB4401	900	750	---	775	---	808
WB4422	875	725	950	750	925	845
WB4510CLP	900	600	1000	850	950	860
Yellowstone	1000	725	950	850	925	890
Location Average	912	741	952	815	914	882
Hard White Winter Wheat						
Golden Spike (W)	---	---	900	---	950	925
IDO2006 (W)	875	675	1000	725	800	815
Irv (W)	---	---	925	---	825	875
Millie (W)	925	725	1200	900	1000	950
MT1491 (W)	---	---	950	---	875	913
UI Bronze Jade 1 (W)	900	800	975	650	850	835
UI Silver (W)	---	---	1100	---	975	1038
Location Average	900	733	1007	758	896	907

Table 72. Grain Protein & Kernel Hardness of Soft White Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Grain Protein (%)						Kernel Hardness 0 - 100					
	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average
AP Exceed	13.0	10.7	11.9	13.1	12.5	12.2	23	45	39	25	33	33
AP Iliad	13.9	11.2	12.2	14.1	15.2	13.3	37	40	43	29	48	40
IDO1708	12.3	9.9	12.1	14.5	14.1	12.6	23	29	35	32	39	31
LCS Blackjack	12.7	11.0	12.9	---	---	12.2	28	32	42	---	---	34
LCS Hulk	13.1	11.0	12.7	13.6	14.2	12.9	26	41	30	24	42	32
Norwest Tandem	12.6	10.7	13.1	14.3	13.9	12.9	39	39	48	33	43	40
Nimbus	12.3	10.9	13.4	14.2	13.9	13.0	28	41	36	21	43	34
OR2160243	13.2	9.8	11.4	---	---	11.5	38	26	34	---	---	33
OR2160264	13.2	10.1	13.8	---	---	12.4	31	29	39	---	---	33
OR2170559	12.6	10.6	12.0	---	---	11.7	35	34	37	---	---	35
ORI2190027CL+	12.9	10.7	13.4	14.5	14.8	13.3	29	39	40	37	49	39
Piranha CL+	13.4	10.3	12.1	14.5	14.4	13.0	30	26	39	28	48	34
Sockeye CL+	12.6	10.2	12.1	14.0	14.7	12.7	23	34	27	30	42	31
Stephens	12.6	10.6	12.8	15.3	14.0	13.1	33	35	46	32	47	39
Stingray CL+	13.0	10.4	13.3	---	---	12.2	31	41	34	---	---	35
SY Assure	13.2	10.4	12.7	13.9	15.5	13.1	34	32	46	31	47	38
SY Ovation	12.7	10.9	13.6	14.6	14.9	13.4	28	38	45	34	56	40
TMC M-Pire	12.8	10.4	13.4	13.8	14.2	12.9	35	33	43	37	51	40
UI Magic CL+	13.1	10.6	12.4	14.2	15.2	13.1	34	42	40	33	48	39
UI Sparrow	13.8	10.6	13.0	13.5	13.7	12.9	39	37	51	33	48	41
UIL 14-211120A	12.8	10.0	13.3	14.3	13.5	12.8	30	40	39	31	38	35
UIL 17-995133B	11.9	10.3	12.2	13.0	13.3	12.2	32	38	44	34	42	38
UIL13-046145A	12.1	9.9	12.7	13.7	13.9	12.5	31	44	41	23	51	38
UIL15-028024	12.3	10.3	12.8	13.7	14.6	12.7	35	37	44	31	49	39
VI Presto CL+	13.0	10.3	12.0	14.6	13.6	12.7	27	34	42	26	42	34
VI Shock	12.3	10.1	12.1	---	---	11.5	32	30	41	---	---	34
VI Voodoo CL+	13.6	10.5	12.6	13.7	14.9	13.1	26	32	30	30	41	32
WA8293	13.4	10.4	13.0	---	13.5	12.6	36	37	44	---	49	41
WB 456	14.0	11.3	12.8	13.8	15.0	13.4	37	51	49	30	47	43
WB1376CLP	13.7	11.6	13.6	14.1	14.9	13.6	35	40	48	34	40	39
WB1529	13.0	10.7	12.8	---	---	12.1	25	37	43	---	---	35
WB1621	12.5	10.7	12.2	13.5	13.2	12.4	27	30	44	23	34	32
WB1783	12.6	11.0	12.6	13.4	15.6	13.0	32	47	52	46	60	47
Appleby CL+	---	---	---	13.8	15.5	14.6	---	---	---	31	45	38
Devote	---	---	---	13.8	15.2	14.5	---	---	---	34	49	41
Eltan	---	---	---	13.2	15.3	14.2	---	---	---	24	44	34
Eltan 11-52-0	---	---	---	13.4	15.4	14.4	---	---	---	32	45	39
Norwest Duet	---	---	---	14.0	14.5	14.3	---	---	---	27	51	39
Otto	---	---	---	13.4	15.3	14.3	---	---	---	36	50	43
UIL 17-7706 (CL+)	---	---	---	14.5	14.5	14.5	---	---	---	28	50	39
UIL16-478001	---	---	---	12.6	14.3	13.4	---	---	---	34	52	43
WA8334	---	---	---	13.4	14.3	13.8	---	---	---	29	47	38

Table 73. Percent Flour Protein and Flour Yield of Soft White Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Flour Protein (14% mb)						Flour Yield (%)						
	Aberdeen	Kimberly	Ririe	Irrig	Ririe Dry	Soda Springs	Average	Aberdeen	Kimberly	Ririe	Irrig	Ririe Dry	Soda Springs
AP Exceed	9.56	8.16	8.56	10.68	9.67	9.3	74.4	74.8	72.4	70.9	72.7	72.7	73
AP Iliad	9.89	8.49	9.02	11.51	12.55	10.3	74.3	75.5	72.1	70.6	69.8	69.8	72
IDO1708	9.79	7.67	8.99	11.85	11.56	10.0	75.3	75.6	72.9	68.3	70.9	70.9	73
LCS Blackjack	9.28	8.41	10.02	---	---	9.2	76.9	77.8	73.3	---	---	---	76
LCS Hulk	9.2	8.63	9.07	11	11.44	9.9	74.2	75.8	71.7	69.0	71.0	71.0	72
Norwest Tandem	8.99	8.12	9.97	11.05	11.33	9.9	72.9	74.5	70.4	68.0	72.6	72.6	72
Nimbus	8.8	8.09	9.68	11.01	11.24	9.8	75.5	75.9	71.5	69.9	71.9	71.9	73
OR2160243	8.85	7.56	8.67	---	---	8.4	74.0	76.4	74.3	---	---	---	75
OR2160264	9.21	7.66	10.24	---	---	9.0	75.6	77.7	72.1	---	---	---	75
OR2170559	8.75	7.79	9.64	---	---	8.7	74.9	75.9	76.8	---	---	---	76
ORI2190027CL+	9.27	7.97	11.02	11.73	12.06	10.4	71.3	73.6	72.1	66.1	66.6	66.6	70
Piranha CL+	8.45	7.93	9.43	11.46	11.83	9.8	73.5	75.7	73.4	67.8	70.4	70.4	72
Sockeye CL+	9.94	7.87	9.39	11.36	11.62	10.0	74.4	76.0	74.7	68.8	70.8	70.8	73
Stephens	8.37	7.89	9.94	12.24	11.83	10.1	74.8	75.7	73.7	68.0	71.9	71.9	73
Stingray CL+	9.16	7.86	10.58	---	---	9.2	73.6	74.2	72.2	---	---	---	73
SY Assure	8.5	8.12	9.83	10.96	12.79	10.0	73.0	74.8	73.8	68.2	70.3	70.3	72
SY Ovation	10.06	8.45	10.66	11.34	11.97	10.5	74.7	75.2	74.1	71.1	70.2	70.2	73
TMC M-Pire	10.22	8.16	10.47	11.27	11.47	10.3	75.6	77.2	74.2	70.8	73.2	73.2	74
UI Magic CL+	10.55	7.85	9.39	11.4	12.45	10.3	73.9	74.4	73.6	68.4	70.6	70.6	72
UI Sparrow	11.39	8.12	10.47	10.51	10.89	10.3	71.4	74.4	72.9	67.9	72.3	72.3	72
UIL 14-211120A	10.47	7.89	10.42	11.42	10.65	10.2	74.2	74.5	73.0	69.5	72.8	72.8	73
UIL 17-995133B	9.4	7.33	9.68	10.16	10.52	9.4	73.7	74.8	74.5	69.1	72.9	72.9	73
UIL13-046145A	9.86	7.41	9.45	10.63	11.25	9.7	74.5	73.8	73.5	68.2	72.9	72.9	73
UIL15-028024	9.76	7.69	9.84	11.09	12.06	10.1	74.6	74.1	72.4	69.7	71.5	71.5	72
VI Presto CL+	10.55	8.13	9.6	11.54	11.25	10.2	75.0	75.5	76.4	69.4	73.3	73.3	74
VI Shock	10	7.7	9.44	---	---	9.0	75.2	76.4	75.3	---	---	---	76
VI Voodoo CL+	10.87	8.27	9.81	11.04	11.97	10.4	72.2	76.0	73.4	68.4	69.0	69.0	72
WA8293	10.74	7.8	10.22	---	10.84	9.9	74.9	76.2	73.5	---	74.1	74.1	75
WB 456	11.63	8.85	10.46	10.73	12.44	10.8	74.9	77.0	75.4	94.0	72.7	72.7	79
WB1376CLP	10.92	9.06	10.97	11.59	12.24	11.0	74.0	75.0	75.5	68.9	70.4	70.4	73
WB1529	10.09	8.52	9.94	---	---	9.5	73.9	74.0	74.7	---	---	---	74
WB1621	9.91	8.18	9.57	10.58	10.21	9.7	74.5	76.1	76.2	68.8	72.7	72.7	74
WB1783	10.09	8.53	9.73	10.46	12.63	10.3	75.2	75.1	75.2	69.4	70.0	70.0	73
Appleby CL+	---	---	---	10.78	12.68	11.7	---	---	---	69.1	70.3	70.3	70
Devote	---	---	---	11.03	12.57	11.8	---	---	---	66.6	69.6	69.6	68
Eltan	---	---	---	10.27	12.3	11.3	---	---	---	66.5	70.5	70.5	68
Eltan 11-52-0	---	---	---	10.59	12.88	11.7	---	---	---	66.2	71.6	71.6	69
Norwest Duet	---	---	---	10.88	11.73	11.3	---	---	---	71.0	73.8	73.8	72
Otto	---	---	---	10.27	12.93	11.6	---	---	---	69.6	71.5	71.5	71
UIL 17-7706 (CL+)	---	---	---	11.45	11.74	11.6	---	---	---	69.3	70.9	70.9	70
UIL16-478001	---	---	---	10.32	11.86	11.1	---	---	---	69.6	71.6	71.6	71
WA8334	---	---	---	9.87	11.5	10.7	---	---	---	69.0	66.5	66.5	68
Location Average	9.8	8.1	9.8	11.0	11.7	10.2	74.3	75.4	73.7	69.6	71.2	71.2	72.6

mb = moisture basis

Table 74. Percent Break Flour Yield and Cookie Diameter of Soft White Winter Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Break Flour Yield (%)						Cookie Diameter (cm)					
	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average	Aberdeen	Kimberly	Ririe Irrig	Ririe Dry	Soda Springs	Average
AP Exceed	49.7	46.2	45.8	49.6	46.4	47.5	8.7	8.8	8.6	8.2	8.2	8.5
AP Iliad	49.7	45.5	44.8	46.2	40.8	45.4	8.7	8.8	8.4	8.4	8.0	8.5
IDO1708	49.7	48.2	45.9	44.0	40.5	45.7	8.8	9.0	8.7	8.0	8.1	8.5
LCS Blackjack	49.7	48.5	46.0	---	---	48.1	8.6	8.6	8.5	---	---	8.6
LCS Hulk	49.5	44.9	45.1	47.0	40.8	45.5	8.4	8.8	8.4	8.1	7.9	8.3
Norwest Tandem	48.5	44.4	44.6	45.8	42.6	45.2	8.4	8.7	8.4	8.3	8.3	8.4
Nimbus	52.2	46.4	48.0	49.7	44.1	48.1	8.8	8.8	8.5	8.2	8.4	8.5
OR2160243	52.4	50.3	49.7	---	---	50.8	8.7	9.1	8.6	---	---	8.8
OR2160264	50.7	50.0	46.7	---	---	49.1	8.7	9.0	8.3	---	---	8.6
OR2170559	48.7	45.8	48.5	---	---	47.7	8.7	8.9	8.4	---	---	8.7
OR12190027CL+	46.7	43.5	44.9	43.3	37.9	43.3	8.8	8.8	8.1	8.0	7.8	8.3
Piranha CL+	50.0	46.5	49.1	46.6	39.5	46.3	8.6	9.0	8.4	8.2	7.9	8.4
Sockeye CL+	51.9	49.0	51.2	48.8	41.8	48.5	8.8	8.9	8.4	8.0	8.2	8.4
Stephens	45.7	43.2	43.8	40.9	38.6	42.4	8.7	8.8	8.4	8.0	8.1	8.4
Stingray CL+	49.9	44.5	46.7	---	---	47.0	8.8	8.8	8.5	---	---	8.7
SY Assure	49.4	46.3	46.1	46.2	41.8	45.9	8.4	8.5	8.6	8.4	8.0	8.4
SY Ovation	47.4	43.7	46.2	43.4	38.1	43.8	8.9	8.7	8.4	8.3	7.8	8.4
TMC M-Pire	47.2	44.6	45.3	43.6	39.9	44.1	8.8	8.7	8.3	8.1	8.0	8.4
UI Magic CL+	48.2	45.2	46.2	44.4	39.6	44.7	8.6	8.8	8.5	8.1	7.9	8.4
UI Sparrow	47.0	42.8	45.3	46.2	40.9	44.4	8.4	8.5	8.3	8.3	8.3	8.3
UIL 14-211120A	47.1	44.3	46.1	43.4	42.9	44.7	8.5	8.8	8.4	8.2	7.9	8.3
UIL 17-995133B	51.8	48.5	50.1	48.9	43.5	48.5	8.8	8.7	8.6	8.4	8.3	8.6
UIL13-046145A	49.4	44.4	47.4	47.9	42.2	46.2	9.0	9.2	8.7	8.4	8.3	8.7
UIL15-028024	49.2	45.6	47.7	45.6	39.6	45.5	8.9	9.1	8.4	8.4	8.1	8.6
VI Presto CL+	46.2	43.3	44.3	40.9	40.2	43.0	8.7	8.8	8.6	8.3	8.2	8.5
VI Shock	51.2	47.3	49.0	---	---	49.2	8.8	8.9	8.8	---	---	8.8
VI Voodoo CL+	50.7	47.0	48.9	46.2	40.4	46.7	8.4	8.8	8.6	8.1	7.8	8.3
WA8293	48.2	42.5	46.9	---	40.8	44.6	8.5	8.6	8.0	---	8.2	8.3
WB 456	46.3	44.8	45.5	88.7	40.3	53.1	8.6	8.8	8.5	8.4	8.1	8.5
WB1376CLP	47.1	42.9	45.9	42.4	40.7	43.8	8.8	8.7	8.6	8.2	7.9	8.4
WB1529	47.1	45.9	46.5	---	---	46.5	8.7	8.8	8.4	---	---	8.6
WB1621	45.5	48.0	48.3	43.1	45.2	46.0	8.3	8.8	8.6	8.5	8.2	8.5
WB1783	49.1	43.5	44.6	40.3	36.5	42.8	8.7	8.3	8.2	8.0	7.6	8.2
Appleby CL+	---	---	---	42.9	37.8	40.4	---	---	---	8.4	7.9	8.1
Devote	---	---	---	46.1	40.3	43.2	---	---	---	8.3	7.8	8.0
Eltan	---	---	---	46.5	39.4	43.0	---	---	---	8.2	8.0	8.1
Eltan 11-52-0	---	---	---	46.7	43.4	45.0	---	---	---	8.1	7.8	7.9
Norwest Duet	---	---	---	47.2	42.2	44.7	---	---	---	8.3	8.0	8.1
Otto	---	---	---	48.5	41.4	44.9	---	---	---	8.2	8.0	8.1
UIL 17-7706 (CL+)	---	---	---	46.0	39.1	42.6	---	---	---	8.2	8.0	8.1
UIL16-478001	---	---	---	48.9	40.5	44.7	---	---	---	8.2	8.1	8.2
WA8334	---	---	---	46.7	36.1	41.4	---	---	---	8.3	7.7	8.0
Location average	48.9	45.7	46.7	46.8	40.7	45.6	8.7	8.8	8.5	8.2	8.0	8.4

Table 75. Solvent Retention Capacity data for Soft White Winter Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Aberdeen				Kimberly				Ririe Irrigated				Ririe Dryland				Soda Springs			
	Water	Sucrose	Na2CO3	Acid	Water	Sucrose	Na2CO3	Acid	Water	Sucrose	Na2CO3	Acid	Water	Sucrose	Na2CO3	Acid	Water	Sucrose	Na2CO3	Acid
AP Exceed	49.4	87.6	67.9	70.7	49.5	83.4	64.1	58.6	50.7	85.4	64.4	71.1	48.8	92.0	75.7	111.6	50.5	88.3	71.2	78.7
AP Iliad	49.4	95.9	66.6	83.8	51.3	86.2	67.1	63.3	51.5	92.0	70.2	85.2	50.9	99.1	72.3	115.2	54.8	97.0	71.7	82.3
IDO1708	50.2	91.6	73.0	88.0	50.3	87.8	70.9	70.1	51.3	89.5	73.0	92.2	52.9	107.8	73.6	139.5	54.0	98.4	73.6	100.4
LCS Blackjack	49.1	87.9	64.8	84.8	49.8	81.7	67.9	66.4	51.5	90.7	69.9	94.5	---	---	---	---	---	---	---	---
LCS Hulk	49.5	91.1	70.8	101.0	49.9	85.3	64.1	69.6	50.9	90.6	67.2	95.5	50.7	100.3	72.5	124.4	54.2	93.1	70.1	85.2
Norwest Tandem	50.8	91.8	73.4	93.7	50.6	84.7	68.1	65.6	52.9	93.6	70.4	101.9	50.6	97.0	72.1	126.8	53.8	95.8	75.9	100.7
Nimbus	47.8	93.5	72.0	79.7	48.5	82.7	65.7	65.8	50.6	94.9	72.3	100.5	49.7	102.2	74.8	132.2	53.0	94.5	75.6	90.4
OR2160243	48.7	94.7	68.9	98.8	49.7	83.0	67.7	63.6	49.3	85.4	69.7	85.7	---	---	---	---	---	---	---	---
OR2160264	49.0	88.6	63.5	97.0	49.2	80.6	63.5	62.2	50.3	92.8	64.7	103.7	---	---	---	---	---	---	---	---
OR2170559	50.2	93.4	69.8	87.1	50.3	83.9	65.4	61.2	50.6	90.2	72.3	83.2	---	---	---	---	---	---	---	---
ORI2190027CL+	51.4	93.5	70.0	80.1	53.4	88.8	69.8	66.0	55.4	98.1	81.5	83.7	54.1	107.4	72.5	111.3	56.3	98.0	76.6	77.1
Piranha CL+	49.6	100.1	73.0	90.2	49.8	84.3	68.8	59.7	52.5	97.3	76.0	92.7	51.8	106.5	74.7	135.2	53.0	96.1	69.6	80.0
Sockeye CL+	46.8	89.8	71.9	84.1	49.0	82.9	64.9	63.6	52.1	94.9	79.6	96.1	50.7	102.3	78.6	137.3	51.7	93.4	69.4	87.3
Stephens	48.5	88.9	65.7	70.7	50.1	82.9	65.1	58.3	51.5	88.9	68.7	81.8	51.1	94.7	63.0	116.1	53.7	91.8	69.2	79.9
Stingray CL+	48.3	94.6	71.6	74.6	50.0	81.3	63.5	58.0	50.6	94.0	76.5	82.8	---	---	---	---	---	---	---	---
SY Assure	48.7	95.4	69.6	80.1	52.8	87.0	69.1	60.5	51.0	91.4	70.8	78.4	50.5	104.5	71.2	114.9	55.1	99.0	75.3	81.7
SY Ovation	48.9	85.7	67.1	77.1	49.7	81.8	62.8	63.5	51.7	90.8	72.8	86.6	49.7	89.5	66.0	103.7	54.0	90.7	68.6	76.2
TMC M-Pire	48.5	88.8	63.4	77.1	51.6	83.2	65.5	63.0	52.0	94.0	72.0	88.2	50.5	92.5	67.4	110.3	55.4	91.9	71.4	72.3
UI Magic CL+	48.0	89.4	66.9	96.3	51.6	84.2	65.4	71.6	51.6	90.8	72.0	101.8	50.7	96.2	67.9	135.0	55.6	93.5	71.6	91.6
UI Sparrow	51.2	94.3	71.8	115.1	53.8	84.1	68.7	78.6	53.2	92.3	77.1	100.4	50.1	95.2	72.4	133.9	53.5	90.0	71.9	100.2
UIL 14-211120A	48.0	86.0	66.9	83.5	50.9	82.4	66.9	61.2	50.8	92.0	76.0	92.7	49.8	92.7	65.6	113.1	50.9	91.5	68.0	92.4
UIL 17-995133B	49.1	91.5	70.6	85.9	54.3	86.0	68.2	73.0	52.4	96.1	78.1	96.4	51.1	99.7	72.6	127.8	53.7	91.7	74.9	91.0
UIL13-046145A	50.4	89.4	67.9	79.3	53.4	83.3	67.7	64.9	53.1	91.7	75.5	93.4	48.9	96.4	70.2	133.0	51.8	89.0	66.7	84.0
UIL15-028024	48.8	86.0	65.1	95.3	51.7	81.8	65.3	65.5	51.7	93.6	75.8	111.0	49.5	94.4	67.0	141.1	53.6	92.9	67.0	97.0
VI Presto CL+	47.3	84.5	66.9	64.9	49.4	79.4	64.3	53.0	49.4	87.3	69.2	66.2	48.1	88.9	64.3	111.3	50.5	88.7	69.0	72.4
VI Shock	48.1	94.2	68.8	90.6	50.8	83.9	66.0	66.4	51.4	96.4	78.0	99.8	---	---	---	---	---	---	---	---
VI Voodoo CL+	51.8	99.8	76.3	123.5	51.1	85.1	65.7	87.8	51.1	95.1	75.3	112.8	50.0	99.2	72.2	144.2	53.9	98.1	75.2	110.2
WA8293	50.8	95.4	69.9	85.2	53.0	83.0	67.5	62.3	52.8	97.4	77.7	90.3	---	---	---	---	53.8	92.9	70.0	70.4
WB 456	49.5	89.0	67.9	78.8	51.6	82.7	65.4	61.4	50.8	89.0	72.0	78.9	49.6	90.8	65.0	116.0	53.8	91.0	68.6	71.0
WB1376CLP	49.1	92.0	68.9	69.8	50.6	83.6	67.0	59.7	52.1	91.8	73.7	79.2	51.3	94.0	68.9	128.0	53.6	97.5	77.4	89.7
WB1529	50.4	95.7	70.4	94.8	51.2	86.8	70.7	77.5	51.4	92.0	79.8	96.4	---	---	---	---	---	---	---	---
WB1621	54.6	99.7	76.9	79.5	50.7	85.4	65.1	71.3	50.3	88.5	70.2	85.8	49.9	94.2	65.7	119.7	49.5	91.7	69.5	95.4
WB1783	48.5	89.6	66.7	76.8	54.6	95.5	71.3	70.9	55.0	100.7	78.2	85.4	53.0	95.3	67.9	111.5	58.0	99.5	76.0	83.8
Appleby CL+	---	---	---	---	---	---	---	---	---	---	---	---	48.8	90.9	62.6	109.2	52.9	95.2	68.6	80.7
Devote	---	---	---	---	---	---	---	---	---	---	---	---	52.6	118.4	74.4	138.9	53.9	98.0	71.0	103.1
Eltan	---	---	---	---	---	---	---	---	---	---	---	---	51.6	111.2	74.0	149.3	53.3	96.4	69.2	112.5
Eltan 11-52-0	---	---	---	---	---	---	---	---	---	---	---	---	51.4	109.6	75.1	154.0	53.9	99.3	69.7	112.3
Norwest Duet	---	---	---	---	---	---	---	---	---	---	---	---	52.1	100.6	78.0	119.7	54.8	96.3	78.6	87.5
Otto	---	---	---	---	---	---	---	---	---	---	---	---	51.8	106.9	77.5	143.1	54.3	99.7	72.3	107.6
UIL 17-7706 (CL+)	---	---	---	---	---	---	---	---	---	---	---	---	50.9	102.7	70.3	135.5	56.3	97.7	77.3	91.5
UIL16-478001	---	---	---	---	---	---	---	---	---	---	---	---	50.2	95.3	79.5	115.8	53.5	95.5	73.8	80.7
WA8334	---	---	---	---	---	---	---	---	---	---	---	---	53.7	107.6	78.0	143.4	60.2	108.5	83.1	109.5
Location average	49.4	91.8	69.2	86.0	51.0	84.2	66.6	65.6	51.6	92.4	73.4	90.7	50.8	99.3	71.3	126.5	53.9	94.9	72.2	89.3

Hard Spring Wheat

Table 76. Grain Protein & Kernel Hardness of Hard Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

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
Hard Red Spring												
Alum	15.8	16.0	14.8	14.0	13.6	14.8	87	85	92	89	73	85
Dagmar	17.0	15.8	15.3	14.4	14.1	15.3	86	96	99	103	67	90
Expresso	16.0	15.5	15.3	14.8	15.4	15.4	89	88	109	83	83	90
Glee	15.2	15.5	14.5	12.8	13.7	14.4	77	87	89	94	71	84
Jefferson HF	13.9	14.3	14.4	13.4	12.5	13.7	88	91	95	110	82	93
Net CL+	15.7	15.4	15.0	13.9	14.1	14.8	82	96	98	107	79	92
SY Gunsight	14.9	15.2	14.3	12.7	13.9	14.2	72	75	81	89	83	80
WB9668	17.0	16.1	15.7	15.2	---	16.0	82	94	92	102	---	93
WB9707	16.0	15.7	15.1	16.5	---	15.8	86	85	90	101	---	90
WB9724CLP	16.2	15.8	15.5	14.3	14.3	15.2	88	96	94	108	72	92
AP Venom	14.7	13.8	13.8	13.0	14.6	14.0	59	73	81	85	81	76
Hale	15.4	15.7	14.8	12.4	14.3	14.5	71	84	89	90	83	84
MT1809	16.7	15.9	15.4	13.9	14.2	15.2	84	101	101	121	90	99
Holmes	16.1	15.4	15.6	13.9	15.1	15.2	89	100	96	109	81	95
LCS Hammer AX	16.0	14.6	14.4	12.5	14.1	14.3	76	93	98	97	85	90
IDO2105S	14.8	14.3	13.8	12.5	13.2	13.7	87	104	90	109	89	96
IDO2202CL2	14.6	14.3	13.6	12.5	13.7	13.8	68	82	85	93	74	80
MT2063	14.8	14.5	13.6	12.8	14.2	14.0	82	87	82	95	86	86
WA 8356	14.8	14.4	14.1	12.0	13.2	13.7	73	83	78	95	73	81
WA 8357	16.6	16.4	16.7	13.5	14.3	15.5	81	93	86	94	85	88
WA 8359	15.0	15.8	14.4	14.2	---	14.9	83	87	97	116	---	96
WA 8388CL+	15.4	---	15.0	13.0	14.5	14.5	70	---	80	98	75	81
MT Carlson	16.4	15.2	14.9	14.0	14.6	15.0	79	83	80	101	86	86
MT Ubet	17.2	16.1	15.6	14.4	14.1	15.5	77	97	82	101	87	89
WA8342R	14.6	14.4	14.4	12.3	14.5	14.0	77	99	103	106	94	96
WA 8373	14.6	14.6	14.0	13.0	13.6	14.0	84	85	90	104	78	88
IDO2104HF	14.9	15.0	14.4	12.7	13.4	14.1	78	93	93	97	85	89
Dayn (W)	14.9	14.3	14.3	13.6	13.0	14.0	80	94	94	113	73	91
SY-Teton (W)	14.7	14.3	13.7	12.8	12.7	13.7	62	72	76	90	71	74
UI Platinum (W)	14.3	14.6	14.3	12.2	13.5	13.8	63	74	74	81	67	72
WB7313 (W)	14.8	15.0	15.3	12.9	---	14.5	70	88	84	83	---	82
WB7589 (W)	15.4	15.6	14.8	13.0	---	14.7	78	86	86	97	---	87
WB7696 (W)	14.6	14.3	14.1	13.6	---	14.2	68	78	74	98	---	80
UI Gold (W)	15.5	14.7	14.7	13.9	13.4	14.4	87	92	95	110	90	95
IDO2002 (W)	14.6	15.1	14.4	12.7	13.3	14.0	66	79	75	96	74	78
WA 8330 (W)	15.7	15.6	15.6	13.1	13.6	14.7	75	87	81	94	75	82
WA 8342W	15.4	14.6	14.0	13.4	---	14.3	79	90	93	96	---	89
WA 8372 (W)	15.2	14.8	14.2	13.3	---	14.4	83	91	91	117	---	95
WA 8374 (W)	14.7	14.6	14.0	13.8	---	14.3	86	92	92	102	---	93
WB7202CLP (W)	---	---	---	---	12.9	12.9	---	---	---	---	80	80
WB9879CLP	---	---	---	---	14.5	14.5	---	---	---	---	80	80
Choteau	---	---	---	---	15.6	15.6	---	---	---	---	105	105
Duclair	---	---	---	---	14.1	14.1	---	---	---	---	83	83
Rocker	16.9	---	---	---	15.2	16.1	103	---	---	---	100	102
Location Average	15.4	15.1	14.7	13.4	14.0	14.5	79	88	89	99	81	88

(W) = White

Table 77. Percent Flour Protein and Flour Yield of Hard Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

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
Hard Red Spring												
Alum	13.1	13.3	12.7	11.6	11.1	12.4	74	73	75	74	70	73
Dagmar	15.3	12.4	13.2	11.6	11.7	12.8	72	72	73	70	69	71
Espresso	13.4	12.8	12.8	12.0	13.2	12.8	72	71	73	70	68	71
Glee	12.9	12.8	11.9	10.7	11.4	11.9	75	73	76	74	72	74
Jefferson HF	11.6	11.4	12.0	11.2	10.7	11.4	75	74	75	73	71	73
Net CL+	13.7	12.6	12.9	11.4	11.4	12.4	73	72	74	71	68	72
SY Gunsight	12.1	12.4	12.2	10.5	11.1	11.7	74	73	75	73	73	74
WB9668	13.8	12.9	12.9	12.2	---	12.9	72	70	74	71	---	72
WB9707	13.7	13.2	13.0	13.6	---	13.4	74	73	75	74	---	74
WB9724CLP	13.6	12.7	13.3	11.6	12.5	12.7	72	72	74	71	71	72
AP Venom	12.2	11.3	11.3	10.3	12.5	11.5	72	71	72	69	69	71
Hale	13.3	12.9	12.6	10.1	11.2	12.0	74	74	73	72	72	73
MT1809	14.0	13.3	12.8	11.4	12.0	12.7	72	72	69	67	69	70
Holmes	12.8	12.4	12.5	11.5	12.4	12.3	71	71	70	68	68	70
LCS Hammer AX	12.8	12.0	11.9	10.2	11.2	11.6	73	74	71	71	71	72
IDO2105S	12.3	12.3	11.1	10.4	11.0	11.4	75	74	73	73	72	73
IDO2202CL2	11.9	11.6	11.2	10.2	11.4	11.2	73	73	71	71	71	72
MT2063	12.4	12.2	11.4	10.2	11.1	11.5	70	71	68	66	69	69
WA 8356	12.1	11.3	12.4	9.7	10.5	11.2	75	74	73	71	72	73
WA 8357	14.4	14.1	13.6	11.7	12.0	13.2	73	72	71	70	70	71
WA 8359	12.2	12.9	11.8	11.8	---	12.2	70	68	67	69	---	68
WA 8388CL+	13.0	---	12.3	10.7	11.9	12.0	72	---	71	71	70	71
MT1939	13.2	13.0	12.6	11.8	11.5	12.4	70	70	69	67	68	69
MT2030	13.8	13.0	12.3	11.1	11.4	12.3	73	74	71	71	70	72
WA8342R	11.7	11.5	11.5	9.5	11.9	11.2	70	70	68	66	67	68
WA 8373	12.4	12.0	11.6	11.2	10.8	11.6	72	71	70	67	69	70
IDO2104HF	12.0	12.5	12.0	9.9	11.0	11.5	74	74	72	71	71	72
WB9879CLP	---	---	---	---	11.5	11.5	---	---	---	---	68	68
Choteau	---	---	---	---	12.7	12.7	---	---	---	---	68	68
Duclair	---	---	---	---	11.2	11.2	---	---	---	---	68	68
Rocker	---	---	---	---	12.3	12.3	---	---	---	---	66	66
Location Average	12.9	12.5	12.3	11.0	11.6	12.1	73	72	72	70	70	71
Hard White Spring												
Dayn (W)	12.8	11.5	11.7	10.9	10.7	11.5	75	74	75	72	72	73
SY-Teton (W)	12.0	11.2	11.6	9.9	10.4	11.0	75	73	74	72	71	73
UI Platinum (W)	12.0	13.0	11.9	9.9	11.6	11.7	76	75	75	72	70	74
WB7313 (W)	12.8	12.6	12.9	10.2	---	12.1	73	73	72	69	---	72
WB7589 (W)	13.3	13.4	12.2	11.6	---	12.6	74	73	72	71	---	72
WB7696 (W)	11.9	11.5	11.8	10.9	---	11.5	75	75	73	72	---	74
UI Gold (W)	13.1	11.8	11.8	11.5	11.1	11.9	72	73	71	71	69	71
IDO2002 (W)	12.4	12.5	11.9	10.1	10.6	11.5	73	72	72	70	71	71
WA 8330 (W)	13.6	12.7	12.3	10.6	10.9	12.0	73	73	72	69	70	71
WA 8342W	12.3	12.0	12.3	10.7	---	11.8	72	71	70	67	---	70
WA 8372 (W)	12.6	12.1	11.9	11.2	---	12.0	73	72	71	68	---	71
WA 8374 (W)	12.0	12.2	11.6	11.6	---	11.8	71	70	69	68	---	69
WB7202CLP (W)	---	---	---	---	10.3	10.3	---	---	---	---	67	67
Location Average	12.6	12.2	12.0	10.7	10.8	11.7	73	73	72	70	70	72

mb = moisture basis

Table 78. Bake Volume of Hard Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Bake Volume (cc)					Average
	Aberdeen	Rupert	Idaho Falls	Tetonia	Soda Springs	
Hard Red Spring Wheat						
Alum	1100	1100	1025	875	850	990
Dagmar	1175	1100	1025	850	825	995
Espresso	1100	1025	975	825	950	975
Glee	1125	1125	1025	825	900	1000
Jefferson HF	950	925	975	800	700	870
Net CL+	1025	1025	1050	750	725	915
SY Gunsight	1100	1050	1000	750	775	935
WB9668	>1200	1125	1175	975	---	1092
WB9707	1100	975	975	1000	---	1013
WB9724CLP	1100	1050	975	825	825	955
AP Venom	1075	1025	825	800	975	940
Hale	1125	1100	1175	725	900	1005
MT1809	1075	975	975	675	775	895
Holmes	1025	1125	900	725	850	925
LCS Hammer AX	1075	1075	800	600	725	855
IDO2105S	1050	1125	850	750	800	915
IDO2202CL2	1050	1025	925	750	825	915
MT2063	1150	1050	875	<600	800	969
WA 8356	1175	1100	1025	725	825	970
WA 8357	1250	1175	1150	875	950	1080
WA 8359	1000	1100	850	775	---	931
WA 8388CL+	1225	---	1050	850	875	1000
MT1939	1150	1200	1025	825	875	1015
MT2030	1200	1075	925	700	750	930
WA8342R	1000	1025	900	700	875	900
WA 8373	1025	1050	950	775	850	930
IDO2104HF	1075	1150	1125	750	875	995
Rocker	1175	---	---	---	900	1038
WB9879CLP	---	---	---	---	800	800
Choteau	---	---	---	---	950	950
Duclair	---	---	---	---	875	875
Location Average	1099	1072	982	788	843	954
Hard White Spring Wheat						
Dayn (W)	1050	1025	900	800	850	925
SY-Teton (W)	1150	1075	1000	900	875	1000
UI Platinum (W)	1025	1100	1050	675	800	930
WB7313 (W)	1000	1025	1125	750	---	975
WB7589 (W)	1175	>1250	1050	800	---	1008
WB7696 (W)	1225	1200	1100	850	---	1094
UI Gold (W)	1025	1000	875	800	725	885
IDO2002 (W)	1150	1075	1000	650	775	930
WA 8330 (W)	>1250	1150	1150	850	900	1013
WA 8342W	975	1050	975	750	---	938
WA 8372 (W)	1025	1000	950	825	---	950
WA 8374 (W)	1075	1075	950	850	---	988
WB7202CLP (W)	---	---	---	---	800	800
Location Average	1080	1070	1010	792	818	957

(W) = White

Table 79. Grain Protein & Kernel Hardness of Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	-----Grain Protein %-----						Aberdee n	-----Kernel Hardness 0-100-----				
	Aberdeen	Rupert	Idaho Falls	Tetonia	Soda Springs	Average		Rupert	Idaho Falls	Tetonia	Soda Springs	Average
Alturas	12.1	10.9	11.6	12.0	11.9	11.7	30	20	25	33	34	29
AP Coachman	---	---	---	---	11.5	11.5	---	---	---	---	45	45
Butch CL+	12.7	11.6	12.4	12.4	12.4	12.3	25	23	28	31	28	27
Hedge CL+ (club)	13.9	12.1	13.1	12.4	11.6	12.6	45	28	41	49	42	41
IDO1404S	12.7	11.4	11.9	12.7	11.6	12.1	31	30	37	35	28	32
UI Warrior	12.9	11.2	11.7	12.1	11.5	11.9	31	30	27	32	36	31
Louise	12.7	11.5	---	---	11.3	11.8	36	37	---	---	31	35
Melba (club)	11.4	11.1	10.6	11.7	11.8	11.3	31	34	39	45	40	38
Ryan	12.2	11.4	12.0	11.8	11.4	11.8	33	28	29	40	30	32
Seahawk	12.8	11.2	11.5	11.1	11.8	11.7	41	36	46	33	43	40
Tekoa	13.0	10.9	11.7	11.8	11.8	11.8	28	31	22	37	26	29
UI Cookie	12.9	11.3	11.9	11.9	12.3	12.1	31	21	32	31	43	31
UI Stone	11.9	11.0	11.3	11.3	11.6	11.4	24	25	19	27	26	24
WB6211CLP	13.6	12.2	12.6	12.1	11.8	12.5	31	25	27	36	35	31
WB6430	12.0	10.9	11.1	11.8	11.8	11.5	28	30	23	37	31	30
WA 8325	12.1	11.6	11.0	11.3	11.0	11.4	33	34	35	39	38	36
WA 8327	12.3	---	11.6	11.3	---	11.7	35	---	31	36	---	34
WA 8351	12.0	10.6	11.5	12.3	11.4	11.6	28	28	35	35	32	31
Location Average	12.6	11.3	11.7	11.9	11.7	11.8	31.9	28.7	31.0	36.0	34.6	33.1

Table 80. Percent Flour Protein and Flour Yield of Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

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	9.7	9.6	9.5	9.4	9.2	9.5	77	76	77	73	75	76
AP Coachman	---	---	---	---	8.9	8.9	---	---	---	---	73	73
Butch CL+	10.4	9.9	9.8	9.6	9.9	9.9	74	74	75	70	74	73
Hedge CL+ (club)	11.1	9.8	10.4	9.6	9.2	10.0	75	76	76	72	74	75
IDO1404S	10.1	9.3	9.2	9.4	9.2	9.4	75	76	76	73	74	75
UI Warrior	10.1	9.2	8.6	9.5	9.1	9.3	75	75	77	73	74	75
Louise	10.2	9.0	---	---	8.7	9.3	76	75	---	---	74	75
Melba (club)	9.2	8.8	8.3	8.9	9.2	8.9	77	77	78	74	74	76
Ryan	10.0	8.9	9.4	9.1	9.0	9.3	75	74	76	72	74	74
Seahawk	10.3	9.2	9.1	8.5	9.2	9.3	76	75	77	73	73	75
Tekoa	10.5	8.8	9.4	9.0	9.3	9.4	76	76	78	73	75	76
UI Cookie	10.4	9.3	9.3	9.4	9.4	9.5	73	73	74	73	71	73
UI Stone	9.6	8.5	9.0	8.7	9.1	9.0	76	74	77	75	75	75
WB6211CLP	11.0	9.9	9.9	9.8	9.0	9.9	70	69	71	69	71	70
WB6430	9.6	8.4	8.4	9.2	9.3	9.0	75	74	76	74	74	75
WA 8325	9.3	9.2	8.7	8.5	8.5	8.8	75	74	75	74	74	74
WA 8327	9.8	---	8.7	8.6	---	9.1	75	---	76	73	---	75
WA 8351	9.6	8.5	8.9	9.3	8.9	9.0	77	75	76	75	74	75
Location Average	10.0	9.1	9.2	9.2	9.1	9.3	75	75	76	73	74	74

mb = Moisture basis

Table 81. Percent Break Flour and Cookie Diameter of Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Break Flour (%)						Cookie Diameter (cm)					
	Aberdeen	Rupert	Idaho Falls	Tetonia	Soda Springs	Average	Aberdeen	Rupert	Idaho Falls	Tetonia	Soda Springs	Average
Alturas	49.9	49.8	47.4	40.7	44.3	46	8.5	8.6	8.9	8.3	8.8	8.6
AP Coachman	---	---	---	---	40.6	41	---	---	---	---	8.6	8.6
Butch CL+	53.0	52.3	50.5	43.7	45.4	49	8.8	8.9	8.7	8.6	8.7	8.7
Hedge CL+ (club)	48.4	47.8	45.6	41.2	43.6	45	8.9	9.2	9.0	8.9	9.0	9.0
IDO1404S	50.9	49.9	47.6	40.9	43.6	47	8.6	8.9	8.9	8.6	8.7	8.8
UI Warrior	50.1	49.7	48.6	41.7	45.5	47	8.5	9.1	8.8	8.9	8.6	8.8
Louise	50.9	49.1	---	---	45.0	48	8.9	9.1	---	---	9.0	9.0
Melba (club)	50.2	49.4	49.2	44.1	44.0	47	9.1	9.2	9.1	9.1	8.9	9.1
Ryan	49.5	49.3	47.3	41.4	44.6	46	8.4	8.9	8.9	8.4	8.8	8.7
Seahawk	47.9	47.9	45.4	42.8	41.6	45	8.8	8.9	8.9	8.9	8.5	8.8
Tekoa	51.6	50.4	48.8	42.6	43.5	47	8.8	9.0	8.7	8.4	8.8	8.8
UI Cookie	48.0	48.7	48.1	43.6	43.6	46	8.8	9.4	8.9	8.8	8.7	8.9
UI Stone	49.5	49.9	50.1	46.4	46.4	48	8.8	9.2	9.1	8.8	9.0	9.0
WB6211CLP	45.9	46.0	45.7	40.6	43.1	44	9.2	8.7	8.4	8.6	8.7	8.7
WB6430	48.8	49.2	49.0	45.3	43.1	47	8.8	9.3	9.1	8.7	9.0	9.0
WA 8325	50.0	49.6	48.1	44.4	45.9	48	8.2	9.5	9.2	8.9	9.1	9.0
WA 8327	50.1	---	49.6	45.0	---	48	9.1	---	8.9	9.0	---	9.0
WA 8351	49.9	48.9	49.7	43.1	43.3	47	8.8	9.1	9.0	8.6	8.7	8.8
Location Average	50	49	48	43	44	47	8.8	9.1	8.9	8.7	8.8	8.8

Table 82. Solvent Retention Capacity data for Soft White Spring Wheat Varieties and Selections Grown in Southeast Idaho, 2023.

Variety or Selection	Aberdeen				Rupert				Idaho Falls			
	Water	Sucrose	Na2CO3	LacticAcid	Water	Sucrose	Na2CO3	LacticAcid	Water	Sucrose	Na2CO3	LacticAcid
Alturas	48.2	90.9	71.3	106.1	48.2	86.2	70.8	92.7	48.4	86.1	69.4	92.6
AP Coachman	---	---	---	---	---	---	---	---	---	---	---	---
Butch CL+	48.9	95.2	75.2	104.8	47.9	90.8	72.1	94.0	48.5	90.2	72.7	93.3
Hedge CL+ (club)	48.1	87.7	68.3	73.7	47.5	81.9	65.6	63.9	49.7	84.8	67.7	67.4
IDO1404S	46.5	88.0	64.8	88.7	46.5	82.0	63.3	69.0	47.5	83.7	64.0	67.9
UI Warrior	48.7	89.0	71.8	112.4	47.7	81.8	70.5	86.9	48.5	83.5	67.9	88.4
Louise	48.7	89.7	69.5	105.5	48.3	84.1	67.6	92.9	---	---	---	---
Melba (club)	47.3	79.1	64.5	66.8	47.3	77.4	65.0	62.6	49.2	79.1	64.0	61.4
Ryan	48.8	87.6	64.2	91.1	48.4	86.0	67.1	83.2	49.3	85.1	65.9	78.2
Seahawk	48.2	86.6	72.0	84.5	48.4	83.3	70.5	74.4	49.9	85.9	69.7	69.6
Tekoa	46.3	88.0	68.4	102.7	47.5	83.6	65.9	91.3	47.5	82.6	71.2	81.0
UI Cookie	47.7	94.0	67.6	104.9	47.7	85.5	68.9	85.7	47.6	86.5	68.6	85.8
UI Stone	47.6	87.8	64.4	102.1	46.2	83.8	64.2	86.6	47.4	85.3	68.3	86.5
WB6211CLP	56.1	109.0	82.8	98.8	50.6	95.4	73.4	75.4	50.5	96.3	78.6	71.3
WB6430	47.9	85.6	65.8	65.9	46.1	80.3	66.7	57.2	47.3	80.4	67.7	57.5
WA 8325	47.5	82.7	67.3	76.2	48.2	80.0	66.0	75.6	48.5	81.1	64.2	70.9
WA 8327	48.6	87.4	66.7	99.2	---	---	---	---	49.4	84.0	67.1	90.5
WA 8351	46.5	84.8	65.1	99.5	47.7	83.5	65.8	83.8	47.8	85.0	65.7	87.8
Location average	48.3	89.0	68.8	93.1	47.8	84.1	67.7	79.7	48.6	85.0	68.3	78.1

Variety or Selection	Tetonia				Soda Springs			
	Water	Sucrose	Na2CO3	LacticAcid	Water	Sucrose	Na2CO3	LacticAcid
Alturas	50.4	90.7	71.2	106.0	50.9	91.2	73.8	110.2
AP Coachman	---	---	---	---	54.3	90.6	77.5	81.0
Butch CL+	50.9	92.9	73.7	113.6	51.7	94.2	78.0	102.9
Hedge CL+ (club)	52.5	88.7	71.0	74.7	51.6	86.4	77.2	71.5
IDO1404S	50.6	87.1	68.2	73.8	50.5	86.0	70.1	77.4
UI Warrior	51.8	88.2	69.9	114.8	50.6	88.8	70.3	108.3
Louise	---	---	---	---	50.9	85.8	74.1	99.0
Melba (club)	51.2	82.3	69.1	66.0	51.3	82.8	67.1	69.0
Ryan	52.5	88.1	69.2	97.3	53.3	86.0	72.8	92.5
Seahawk	51.8	88.1	71.4	72.5	52.4	89.2	71.4	84.4
Tekoa	49.4	86.9	68.2	101.1	51.0	87.9	70.8	98.9
UI Cookie	52.0	91.2	75.6	105.4	51.4	95.1	76.6	116.3
UI Stone	51.3	87.9	68.4	104.0	51.0	86.9	74.4	106.0
WB6211CLP	53.7	100.0	78.4	84.8	52.2	100.9	81.3	91.1
WB6430	52.2	86.9	70.5	73.8	51.8	87.4	69.8	71.7
WA 8325	51.6	85.2	72.3	76.9	50.7	85.4	68.7	82.4
WA 8327	52.2	87.3	71.4	105.0	---	---	---	---
WA 8351	51.2	89.3	70.4	116.3	50.6	87.3	70.7	110.9
Location average	51.6	88.8	71.2	92.9	51.6	88.9	73.2	92.6

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