CIS 528

Plant Your Seedlings Right

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Introduction

PLANTING SEEDLINGS is both an art and a science. Proper handling before, during, and after planting is essential for their success. Before heading to your planting site, make a solid plan and have all the necessary supplies ready. This guide discusses some of the key steps to help you get the best results.

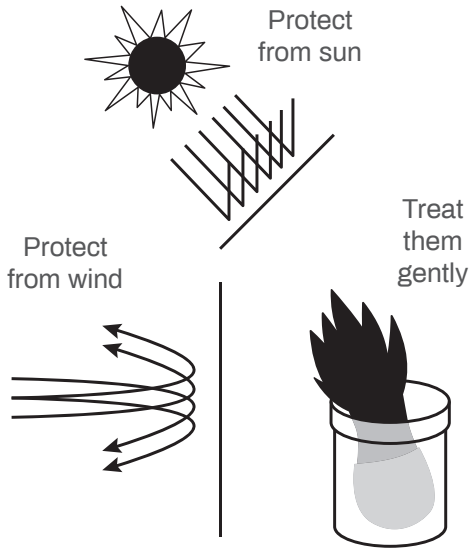
Handle Gently

Handle seedlings gently and as little as possible since their survival and growth depend on new root growth. Improper handling of seedlings harm and reduce outplanting performance. For example, dropping a box of seedlings on the ground or tossing one into the back of a truck can reduce root growth. For many tree species, especially conifers, rough handling risks damaging the top bud, resulting in poor height growth.

Keep Them Cool

Warm seedlings use stored energy that could be used for growth after planting. If you are not able to plant seedlings immediately, store them in their original packaging material in as cool a location as possible for no more than two days. If you must store seedlings for a week or more, maintain them in conditions as close to 35°F as possible. Stored seedlings will keep for a couple of weeks at this temperature and should be checked frequently. Most spring seedling shipments are shipped frozen to help ensure they stay cool throughout the delivery process. Thaw out them fully before planting.

Only remove from refrigerated storage the number of seedlings you expect to plant that day. If your storage area is close to your planting site, remove the seedlings in batches, allowing those planted later in the day to stay cool



as long as possible. Place any remaining ones back into refrigerated storage at the end of each day.

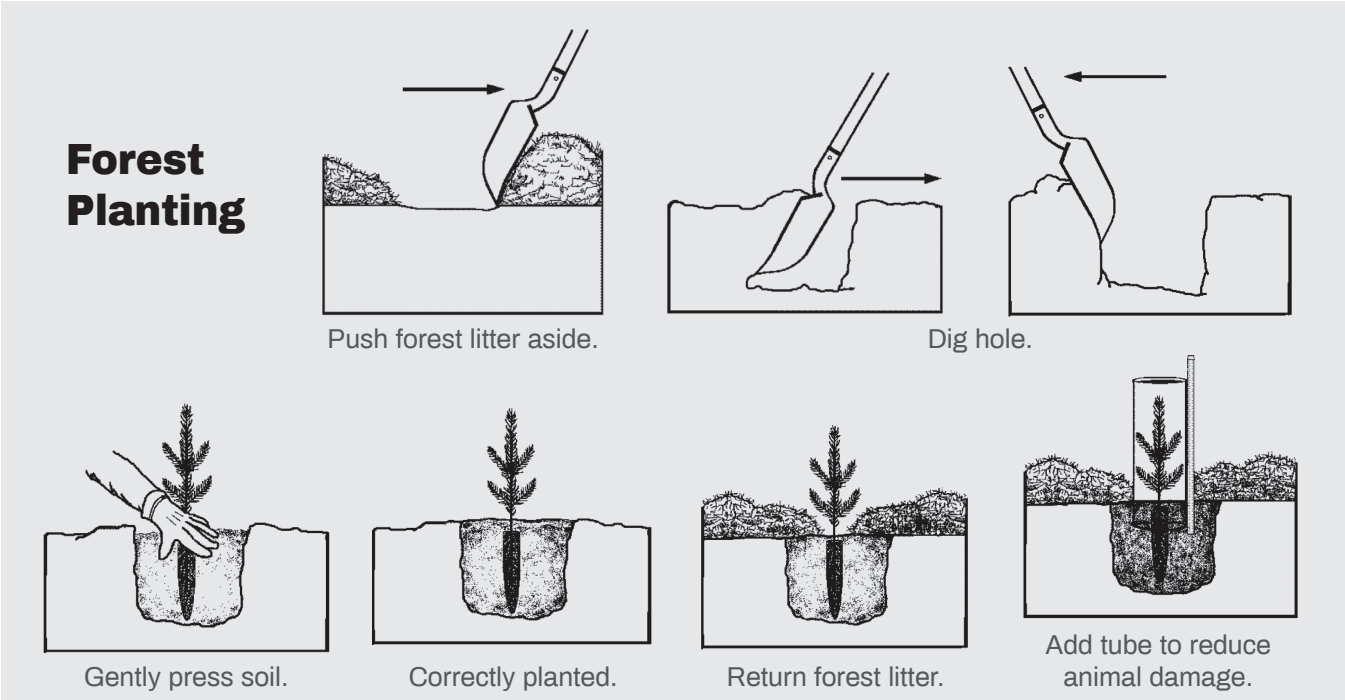
During planting, keep bundles of seedlings out of direct sunlight and be careful how you shade them. Seedlings will be warmer in a box covered with a canvas or plastic tarp than if the box is placed directly in the sun. The best place for seedlings is in heavy shade under existing trees. If you use a canvas or tarp, hang it at least three feet above the box to provide shade and to allow cool air to move between the tarp and box.

Plant Immediately and Permanently

In the inland northwest, plant seedlings as early as possible to take advantage of spring moisture before the onset of the summer drought. If you picked up or had seedlings shipped in the spring, they are cold hardy after being freezer-stored and can stand an occasional frost after planting. If you plant in excessively cold or wet soils, expect poor seedling establishment and potential heavy losses. In general, forest soils are ready for spring planting soon after snow melts. For other plantings, make sure the soil is moist, crumbly, and not sticky and doesn't look shiny when you work it. For best results, plant seedlings in their permanent locations. Transplanting growing seedlings can cause stress, damage roots, and reduce growth, all of which contribute to increased mortality rates.

Fall Planting

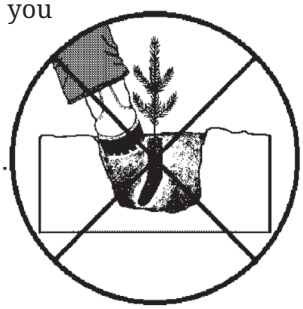
Fall planting is becoming more popular. Even though spring planting is typically recommended, fall planting can help establish certain sites. As with spring planting, soil conditions should be moist and not cold or frozen. Greenhouse-grown seedlings that are planted in the fall are not typically cold hardy since they have not accumulated the necessary chilling hours that cooler outside temperatures

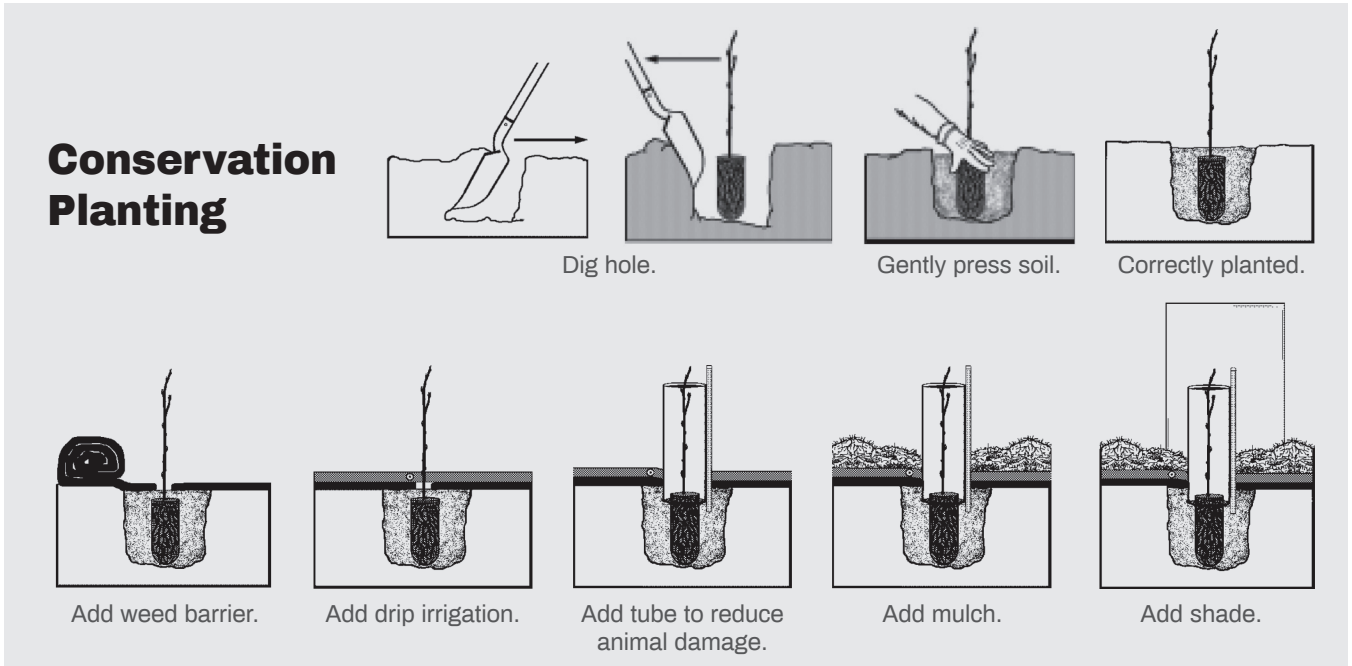


bring. As a result, plant early in the fall so seedlings have enough time to go fully into dormancy before being exposed to frosts. Make sure any fall-planted seedlings are well watered prior to any frost event to help prevent damage and loss.

Ten Planting Tips for Success

1. Protect seedlings from sunlight, wind, and high temperatures, especially before planting. A planting bag or five-gallon bucket is a good way to move seedlings around a planting site.
2. Forest vegetation can compete with seedlings for soil moisture, sunlight, and nutrients. At any planting site, remove dense weedy vegetation. This can be done mechanically by scraping (scalping) an area at least 30 inches square to expose mineral soil. Additionally, use contact herbicides to kill competing vegetation, thereby improving seedling survival and growth. Avoid soil-active herbicides unless you know a chemical will not damage the species you are planting.
3. On forest lands, utilize microsites by planting on the north or east sides of stumps and logs if possible. These “microsites” offer protection from the hot afternoon sun and may retain better soil moisture. Replace forest floor litter around the seedling that was scraped away during planting for a mulching effect.
4. Dig a hole deep enough for the root plug. Spades, shovels, and hoedads work well. Any planting technique that compacts soil, however, is not recommended because it can hamper root growth. We do not recommend dibble planters nor rocking a spade or shovel back and forth in the planting hole.
5. Keep foreign matter (leaves, sticks, duff, rocks, snow and so on) out of the hole.
6. After the hole is ready, remove only one seedling from the bundle. This prevents unnecessary exposure of the roots. If you find a dry plug, dip it in a bucket of cool water for a couple of seconds to saturate the soil around the roots.
7. Place your seedling near the center of the hole, with the top of the root plug about one half to one inch below the soil line. Planting too deep is better than too shallow, as long as you don’t bury any foliage. Avoid exposing the root plugs.
8. Use moist soil to fill the hole. As you fill, gently firm the soil around the roots. Leave no air spaces, but don’t use heavy pressure that compacts the soil—avoid the “Death Stomp,” stomping your foot to pack the soil around the seedling.





9. Control weeds for at least three years. Herbicide application or mechanically pulling the weeds typically yields the best results.
10. Water seedlings until they are well established. This takes about three years. Watering at least once per week is ideal during dry seasons. Any water you can provide is better than none.

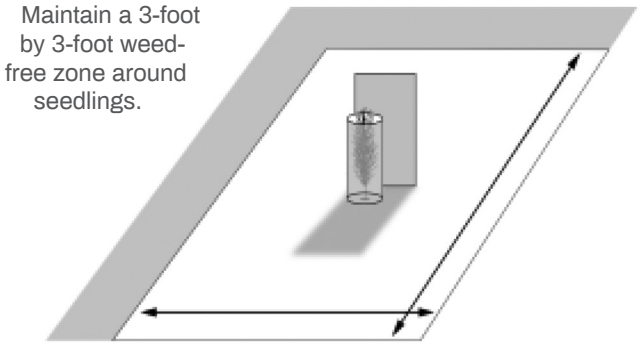
Care After Planting

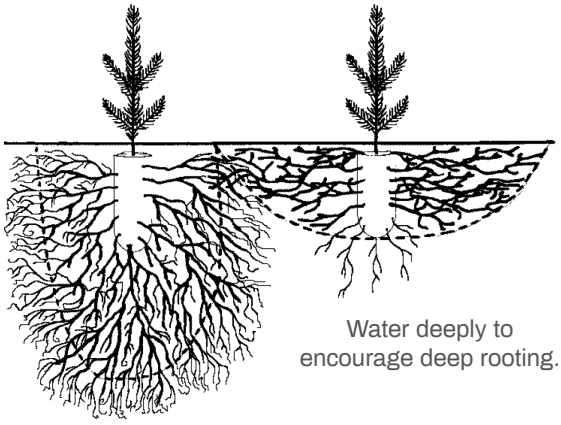
Weeds

Weeds are your number one enemy. Control weeds for at least three years—the longer, the better. Weeds rob seedlings of moisture and nutrients and sometimes light. Weed control often makes the difference between life and death for your plants. They can be controlled three ways: mechanical removal, herbicides, and weed barriers. Mechanical weed control works well if you are persistent because some species sprout from their roots. Using a hoe is the basic approach, but pulling a disc behind a tractor or using a rototiller before planting may be easier. Avoid rototilling deeper than about two inches.

If you use herbicides, protect your seedling from overspraying. A piece of lightweight plastic pipe or a five-gallon bucket attached to a broomstick can be used as a shield. Please consult your county Extension Educator before spraying for current herbicide recommendations and rates.

Weed barriers inhibit weed growth and improve seedling survival and growth by reducing evaporation from soil and lowering soil temperatures. They are often used with mulch; however, mulch can cause issues with small rodents that utilize it for shelter and/or eat the seedlings.




Water deeply to encourage deep rooting.

Watering

Supplemental water probably isn't necessary or feasible if you plant early in the spring on forest land. However, smaller-scale plantings, such as home forests, windbreaks, conservation plantings, and specialty hardwood plantations, benefit from regular watering to improve survival and growth.

If you decide to water, do so about once a week during hot weather, but remember that how often you need to water depends on the soil type and weather conditions. For example, sandy soils do not retain moisture well, so you'll have to water more frequently; clay soils hold moisture very well, so you may not need to water for two or three weeks after a thorough watering. Certain species also require more water than others, something to keep in mind when planning planting and irrigation.

Water long enough to thoroughly moisten the root zone and encourage deep rooting. A drip irrigation line is the most efficient way to water seedlings because it delivers moisture directly to each tree in a controlled and consistent manner and thus wastes less water to runoff or evaporation. Stop watering about one month before the first frost. After a couple of hard frosts, water well going into winter.

Shading

Shading sometimes increases seedling survival. Broad shingles or commercially available plastic cards placed on the south and southwest sides of seedlings do three things: They 1) keep seedlings cooler during the heat of the day; 2) reduce moisture loss from soil; and 3) benefit evergreens in winter by reducing desiccation.

Fertilization

Generally, seedlings do not need to be fertilized. If you choose to fertilize, apply it in the spring as soon as soil is frost-free and seedlings are established. Many fertilizer formulations work fine. Nitrogen usually gives trees the greatest growth response. Application rates vary by soil type and local climate.

A common problem for trees planted in southern Idaho is iron chlorosis. Trees whose new leaves develop a yellow or light yellow-green color, especially between darker green leaf veins, probably suffer from a shortage of available iron and will benefit from applications of a chelated iron-rich fertilizer. An important differentiation between iron and nitrogen chlorosis are the leaves that are affected. Iron is a nonmobile nutrient, so new leaves show the symptom. Nitrogen is a mobile nutrient, so old leaves generally also show the symptom.

Protection

Deer, elk, moose, livestock, rodents, other small animals, lawn mowers, string trimmers, and herbicides can damage seedlings. On forest sites, seedlings will generally be fine without protective devices. If the resident deer and elk population is high, however, mesh-type tubing may be necessary for seedling establishment. After placing them in these tubes, monitor seedlings several times a year for at least three years to prevent damage to them as they grow. Remove the tubes if they are impeding seedling growth after three years. A variety of spray-on repellents are available which generally reduce, but don't eliminate, browsing. For best results, use several products at once and follow label directions.

When planting into pastures or former farm fields converted to grass, montane voles (meadow mice) can completely destroy a plantation within days. Solid tree shelters effectively reduce damage and also protect seedlings from sunscald and winter desiccation. For evergreens, use short tubes (8–12 inches tall). For hardwoods, consider buying taller tubes to protect against browsing. Solid plastic shelters that can be folded around the tree can be removed for maintenance or reused.

Nothing protects your seedlings better than a fence. Though expensive, a high-value hardwood plantation or restoration project justifies the higher cost of constructing a permanent barrier. A good size for a fence to keep large mammals out is 8 feet tall with hot wires at 2-foot intervals. To effectively exclude rodents, use hardware cloth to a height of 2 feet above ground level, extending an additional 2 feet underground.

Specialty Hardwood Crops

In addition to the suggestions provided above, the following are highly recommended if you are growing specialty hardwood crops.

Site Selection

In Idaho, hardwoods do best on sites with deep, well-drained soils with a pH between 5.0 and 7.0. Although many are drought tolerant, north- and east-facing aspects provide moister, cooler environments. Avoid areas of poor drainage or flooding, as well as frost pockets and cold air drainages.

Pruning

Proper pruning is both an art and a science and when done correctly and can greatly increase your plantation's value. Prune while trees are still dormant in late winter or early spring, just before budbreak. Start corrective pruning the winter after seedlings were planted. If you use tree shelters for protection, temporarily remove them and prune any side branches that have formed.

To reduce the number of knots in future logs, remove branches before they reach one inch in diameter, usually by age four or five. Prune branches at the branch collar—a flush cut or leaving a stub interferes with proper wound healing. Wound dressing is unnecessary. Do not remove more than ⅓ of the live crown at a time. Continue annual pruning of side branches until you have a clear bole of at least 9 feet. Some owners continue side pruning their trees until there is as much as 25 feet of clear, straight trunk.

Sunscald

This problem usually occurs in late winter/early spring and affects the southwest side of young tree trunks. Sunny weather activates dormant phloem cells, which can then freeze and die because of cold nighttime temperatures. Winter and spring sunscald can be a serious problem for young trees but can be prevented by wrapping trees in the fall

with two layers of paper tree wrap or by painting the trunks with full strength, white latex paint. Paint alone protects against some desiccation and spring sunscald. Wrap alone protects against winter freezes and desiccation. In Idaho, use both methods to provide the best protection. Paint the trunks first and then wrap them with two layers of paper with the tar side in the middle. Remove the tree wrap in spring at budbreak and rewrap each fall. The paint will continue to provide protection against sunscald. A tree's resistance to sunscald increases as it ages.

Questions?

If you have any questions or suspect an insect, disease, or planting-site problem, contact your local University of Idaho Extension educator (https://www.uidaho.edu/extension/directory/counties), Idaho Department of Lands Forest Health Specialist (https://www.idl.idaho.gov/about-forestry/insects-and-disease/), or consulting forester or U of I Pitkin Forest Nursery staff member (https://www.uidaho.edu/cnr/center-for-forest-nursery-and-seedling-research/pitkin).

Acknowledgments

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