



Planting Forest Seedlings

**How to select, plant
and care for tree
seedlings**



Species and Stock Type

It is highly recommended that you get a site-specific recommendation from a qualified forester regarding which species and stock type (seedling age and size) to plant. Foresters from the Department of Natural Resources, USDA Natural Resources Conservation Service and some Conservation Districts provide this service without charge.

SOME NATIVE TREE SPECIES AND THEIR SITE ADAPTATIONS

Species that need full sunlight

Douglas-fir
All pine species
Red alder
Cottonwood
Willows
Western larch

Species that will tolerate some shade

Western hemlock
Grand fir
Western redcedar
Spruces

Species that will tolerate wet sites

Shore pine
(Lodgepole pine)
Grand fir
Western redcedar
Spruces

Species that will tolerate dry sites

Ponderosa pine
Lodgepole pine

Species to replant on sites with Laminated Root Disease

Any hardwood species
Western redcedar
Western white pine
(Never replant with Douglas-fir)

Species that commonly require protection from wildlife feeding damage

Several species, especially:
Douglas-fir
Cottonwood
Western redcedar

Species very susceptible to insects, disease and fire on many eastern Washington sites

Douglas-fir
Grand fir

Species for stream-side planting

Red alder
Cottonwood
Willows
Western redcedar
Spruces
Grand fir
Douglas-fir (needs sun and good soil drainage)



Planting Zones

Over time Pacific Northwest native tree species have adapted to specific environmental conditions. To recognize these diverse areas, foresters have divided the state into seed zones.

Seed Zones & Elevation are Important Considerations

For most effective results, you should order seedlings grown from seeds collected in the same seed zone and elevation in which they will be planted.

For specific seed zone information, go to **www.dnr.wa.gov** and type “seed zones” in search box.

Planting Seasons



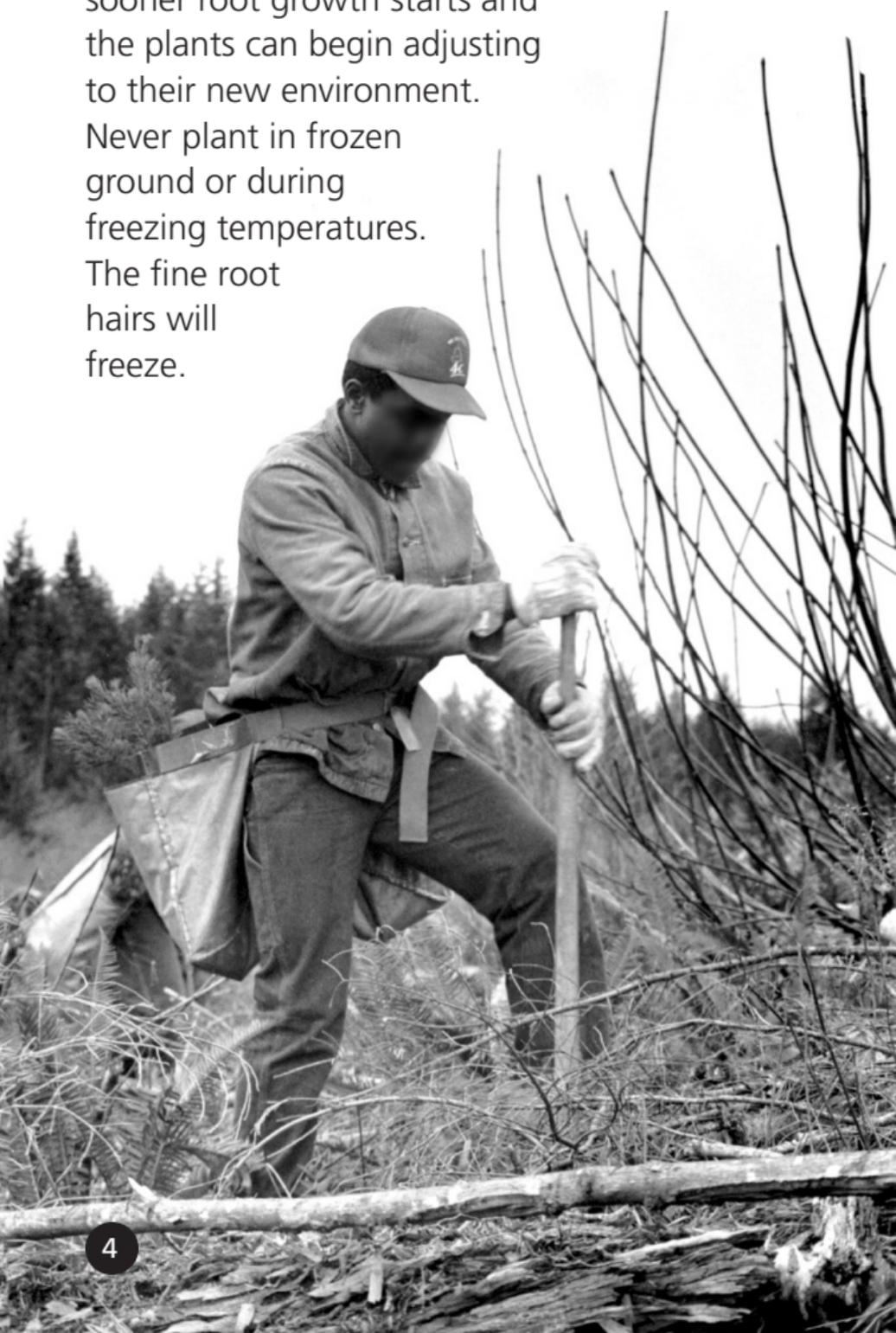
Planting tree seedlings at the right time of year will help avoid some post-planting problems, such as drought and transplant shock.

Seedlings should be planted when they are dormant, generally **December-April**, depending on local conditions. However, the planting season may be extended in areas in which snow covers the ground late into the year.

The sooner seedlings are planted, the sooner root growth starts and the plants can begin adjusting to their new environment.

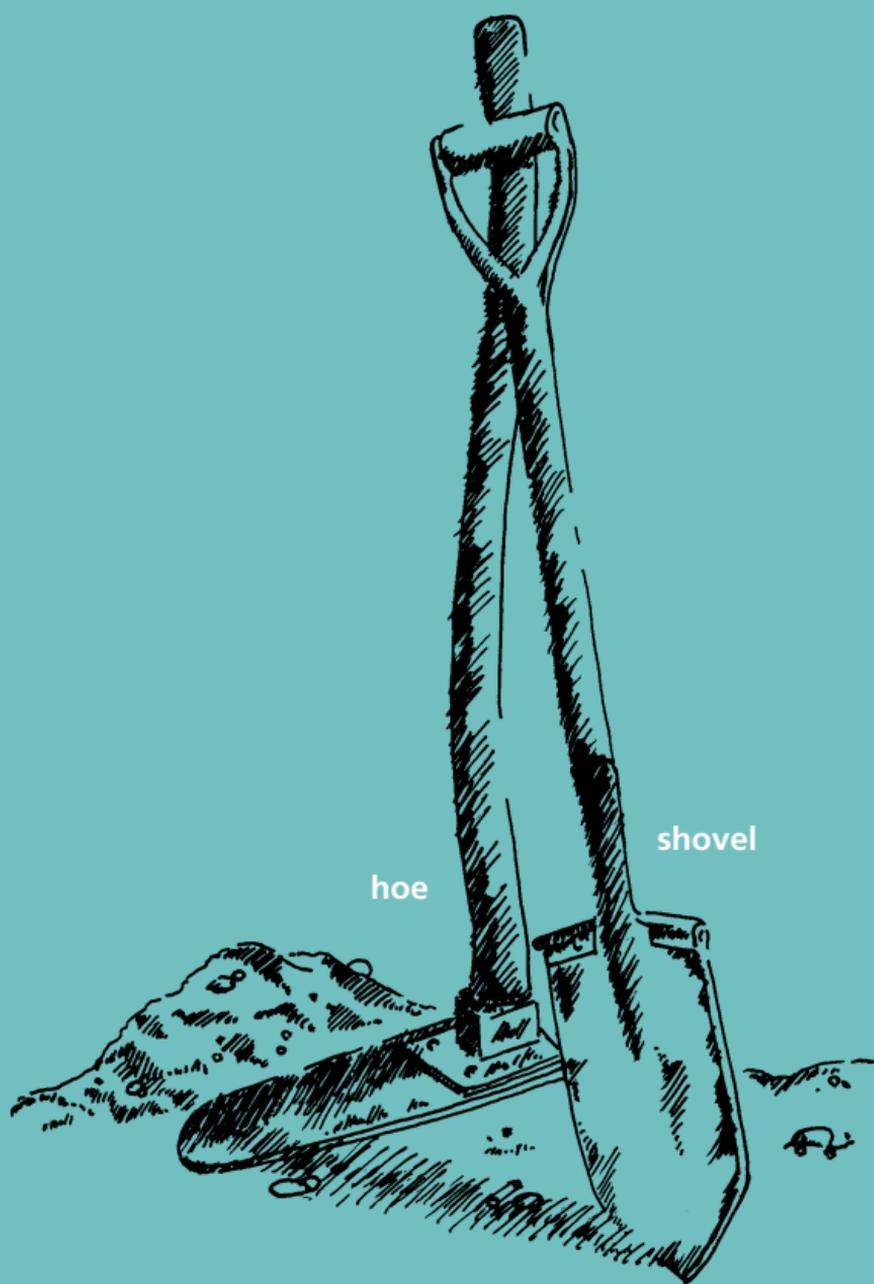
Never plant in frozen ground or during freezing temperatures.

The fine root hairs will freeze.



Planting Tools

Generally, the use of a shovel specifically designed for tree planting is preferred whenever site conditions permit, especially when planting larger seedlings. Planting hoes are still used in specific situations, such as when planting smaller “plug” seedlings on difficult sites where use of a shovel is impractical.



Seedling Care



Nurseries give seedlings the best possible care. The way you handle these seedlings is vital to their survival. To keep these seedlings cool

and moist, you should:



Transport in a covered, well-ventilated vehicle.



Avoid exposure to direct sunlight.



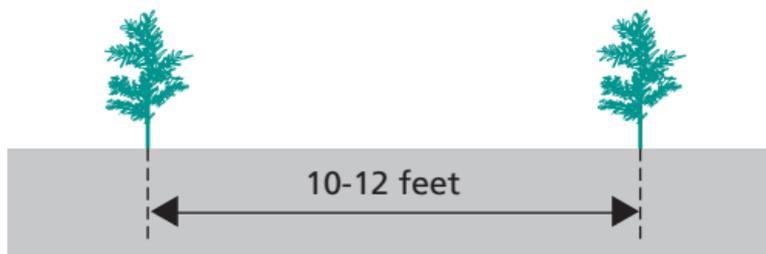
Store in a cool or refrigerated area 33°F (ideal) to 36°F (maximum).

The way you handle these seedlings is vital to their survival.

- Stack no more than three bundles high, allowing space between stacks for air circulation.
- Do not open bags until you are ready to plant.
- Open only one bag at a time.
- Repair torn bags immediately with masking or duct tape.
- Ideally, plant seedlings within days of receiving them.
- Prevent from freezing. If accidentally frozen, thaw slowly before planting.

Spacing Trees

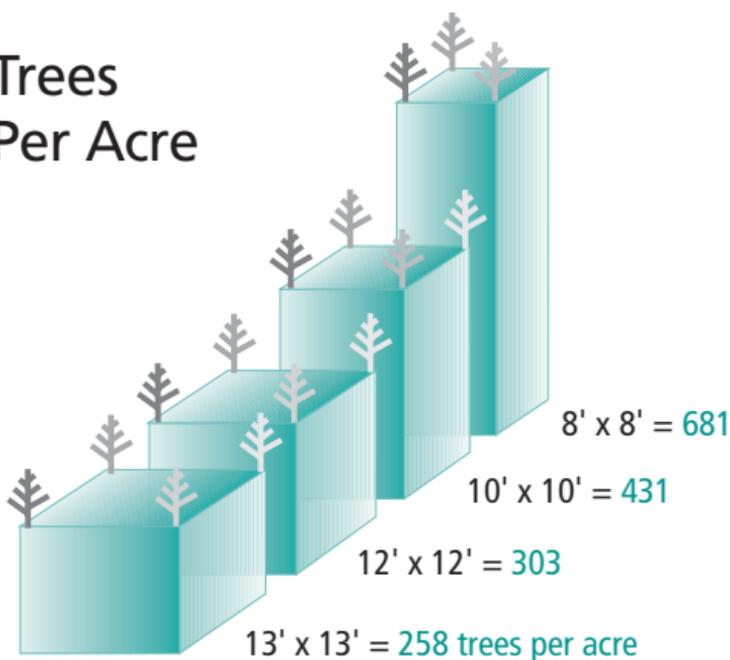
For successful forest plantations, it is generally recommended that you plant seedlings 10 to 12 feet apart. It is advisable to plant seedlings closer together where high mortality is expected.



Current reforestation regulations require a minimum of 190 healthy trees evenly distributed per acre (approximately 15' x 15') in western Washington and 150 healthy trees evenly distributed per acre (approximately 17' x 17') in eastern Washington. Successful reforestation is required within three years of timber harvest (WAC 222-34).

▼ **The chart below will help you determine the desired number of trees per acre.**

Trees Per Acre



Planting With Shovel



1 Insert shovel vertically with blade reversed, push handle away from you, then pull soil back and out of the hole.



2 Hold soil back with shovel and insert tree at proper depth, making sure roots are not bent.

Planting With Hoe/Adze



1 Insert hoe and loosen soil.



2 Pull toward you.



4 Cover roots to base.



5 Pack soil by stomping firmly around the roots.

ERRORS



3 Cover the roots and pack soil by stomping firmly around the roots. The sooner seedlings are planted, the sooner growth starts. Never plant in frozen ground or during freezing temperatures.



3 Insert tree at proper depth, making sure roots are not bent.



6 Tree is planted correctly.



Too shallow



Turned up roots



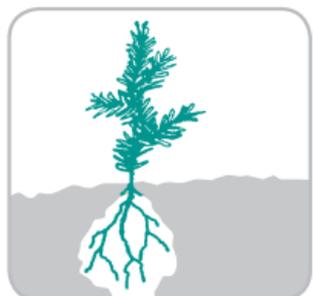
Tangled roots



Too deep



Rock



Air pocket

Site Preparation

As they grow, trees must compete with other vegetation for light, water, nutrients and space. To prepare the ground for seedling planting, you may need to eliminate or reduce undesirable plant growth. This is best done during the summer before planting.

Forest Planting

It is frequently necessary to remove or control competing vegetation and excess logging debris to make the site suitable for planting. A forester can provide site-specific advice.

Open Field

Old fields provide poor conditions for seedling planting due to established sod cover and rodent populations. Fields may require preparation, such as hand scalping, plowing and disking, special tilling, and/or herbicide application to reduce existing plant competition and increase chances of survival.

Vegetation Control Methods

You can use different methods to control unwanted vegetation which competes with young trees. Site-specific advice from a forester is recommended.





Whatever method you choose, use care when clearing vegetation to avoid damaging the site and its resources.

Mechanical Treatments

Scattering, piling, chipping and burning are commonly used to control competing vegetation and remove excess logging debris.

Chemical Treatments

If you choose to use herbicides, be sure to get professional advice. State and federal regulations require that pesticides — including herbicides — be applied in strict adherence to label directions. A license is required to purchase and apply some herbicides, and application of forest herbicides is regulated by the Washington Forest Practices Act.

Animal Damage

In addition to competing vegetation, you may also have to control animal damage. Wildlife and domestic livestock can cause damage by feeding on newly planted seedlings. Protective measures such as tubing, animal repellents, or bud caps may be needed at the time of planting.

▲ For spot preparation, an 18" square may be scalped out with a planting hoe or shovel at the time of planting. Remove all heavy sod and competitive plant growth.

Handling of Seedlings

Exposure to sun, wind, low humidity or freezing temperatures before planting is detrimental to seedling survival. It is vital that seedling roots be kept protected and moist until planted.

- Carry only the number of seedlings that can be planted within two hours.
- Carry seedlings in a pail or planting bag lined with wet burlap, peat moss or similar moist material.
- Remove one seedling at a time from the planting container.
- Plant seedlings into bare mineral soil—no needles, twigs or debris in the planting hole.



CORRECT

Place seedlings in pail or planting bag, keeping roots covered with wet burlap, peat moss or similar moist material.

- Plant seedlings at the same depth that they grew in the nursery. Look at the stem of the seedling to determine the soil level from the nursery. There will be a color change on the stem.
- Take care not to bury foliage or to leave roots curled back or exposed to the air.
- Pack soil firmly around the entire root system, leaving no air pockets.
- Plant seedlings in locations that will provide protection from heat and drought. In forest plantings, when possible, plant seedlings along the north side of stumps or logs or in the partial shade of ferns and small brush clumps, taking care to avoid complete shading and vegetative competition.



INCORRECT

Do not carry seedlings in your hand. If exposed to the air for even a short time, tiny roots will dry out.

Post Planting Care



Timely follow up care after planting can make the difference between success and failure.

Inspect new plantations frequently during the

first few years. It is important to protect seedlings from damage caused by competing vegetation, grazing, fire, wildlife, disease or insects. For help in identifying seedling damage and for corrective advice, contact the Department of Natural Resources, USDA Natural Resources Conservation Service or a WSU Extension Forester.

It is very important to control competing vegetation. This improves survival and growth by conserving moisture and by keeping weeds and brush from smothering and shading out the new trees. It also eliminates undesirable rodent habitats. Supplemental watering or irrigation and shading may be desirable, where feasible, in arid conditions.

For More Help

For free on-site consultation and advice:

DNR Forest Stewardship Program Landowner Assistance Foresters are available to provide forest management advice; including site preparation, reforestation, and early plantation care. Refer to the back panel of this publication for contact information.

To order seedlings:

Webster Forest Nursery

360-902-1234 or 1-877-890-2626 (toll-free)

www.dnr.wa.gov

For advice, educational programs and publications:

Washington State University Extension

Check your local county government listing.

forestry.wsu.edu

For forestry and agricultural assistance and financial incentive programs:

USDA Natural Resources

Conservation Service

Check your local federal government listing.

www.nrcs.usda.gov

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DNR Forest Stewardship Program / Landowner Assistance Contacts

Statewide Program Manager
DNR Small Forest Landowner Office
Mailstop 47012
Olympia WA 98504-7012
(360) 902-1706
Email: foreststewardship@dnr.wa.gov

Statewide Wildlife Biologist
DNR Southeast Region Office
713 Bowers Road
Ellensburg WA 98926
(360) 489-4802

NORTHWEST WASHINGTON

(Western WA north of I-90 including Clallam and Jefferson Counties)

Landowner Assistance Forester
DNR Northwest Region Office
919 N. Township Street
Sedro-Woolley WA 98284
(360) 854-2839

SOUTH SOUND/SOUTHWEST WASHINGTON

(I-90 south through Skamania County)

Landowner Assistance Forester
DNR Small Forest Landowner Office
MS 47012
Olympia WA 98504-7012
(360) 902-2903

NORTHEAST REGION

(Okanogan, Ferry, Stevens, Pend Oreille, Lincoln, Spokane Counties)

Landowner Assistance Program Manager
DNR Northeast Region Office
Colville WA 99114
(509) 685-2712

SOUTHEAST REGION

(all other Eastern Washington counties)

Landowner Assistance Program Manager
DNR Southeast Region Office
713 Bowers Road
Ellensburg WA 98926
(509) 856-4047

People who need this information in an alternative format may call **(360) 902-1706** or **TRS 7-1-1**

