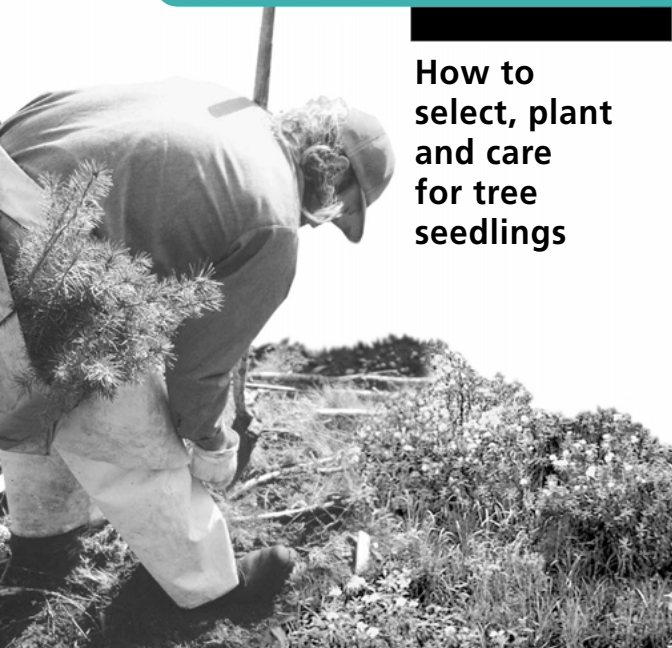




Planting Forest Seedlings



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



WASHINGTON STATE DEPARTMENT OF
Natural Resources

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 which 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.

Success results when seedlings are planted in the zone where their seeds were collected.

The best chance of success results when seedlings are planted in the zone where their seeds were collected. For most effective results, you should request seedlings from the same seed zone and elevation in which they will be planted.

Planting Seasons



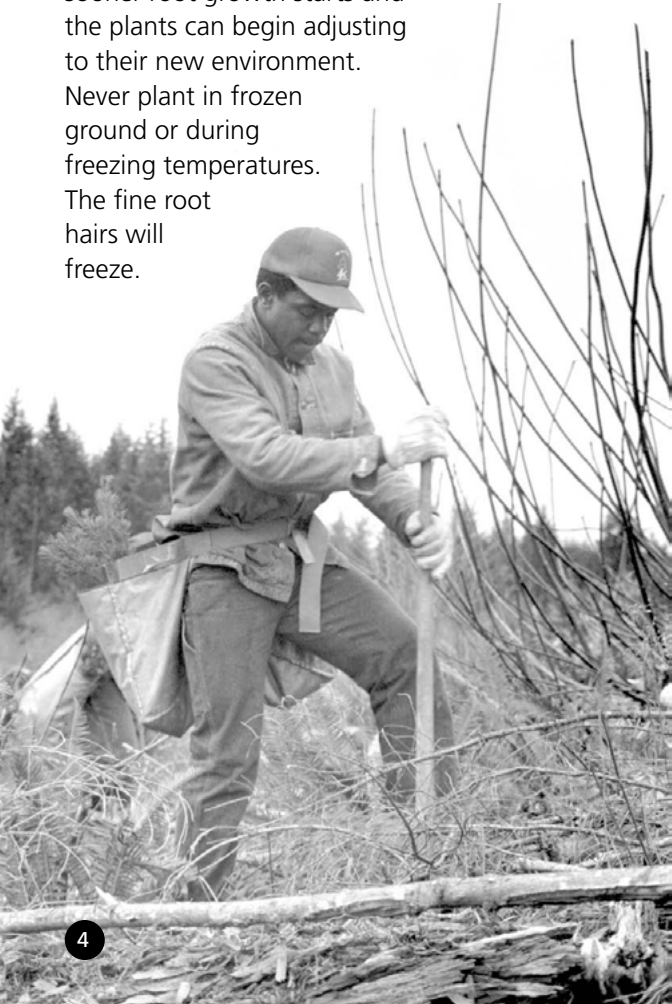
Planting tree seedlings at the right time of year will help avoid some post-planting problems, such as drought and transplant shock.

It is best to plant when seedlings are in dormant condition, generally December 15 – April 15. 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.



Most seedlings can be easily and efficiently planted by one person using a planting hoe or shovel.



Planting Tools

The most widely used hand planting tools are planting hoes and shovels. The hoe is satisfactory for planting small seedlings. It is better to use a shovel for larger seedlings.

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 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.

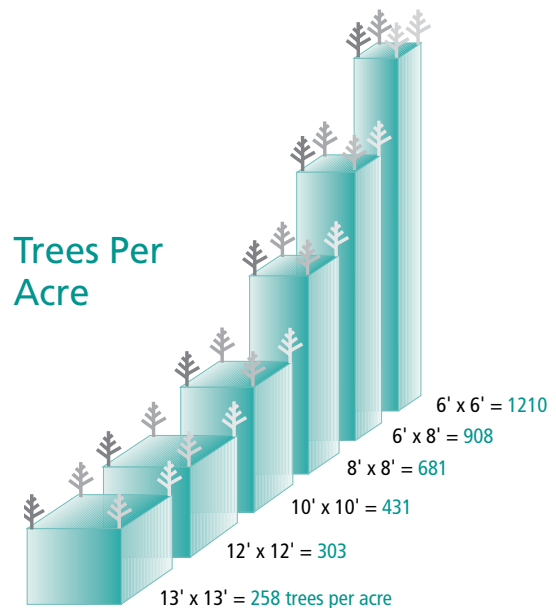
Spacing Trees

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

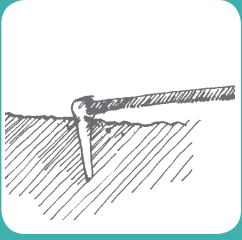
Current reforestation regulations require 190 healthy trees evenly distributed per acre in western Washington and 150 healthy trees evenly distributed per acre in eastern Washington. Reforestation is required within three years of timber harvest (WAC 222-34).

Narrower spacings are recommended for Christmas tree plantations.

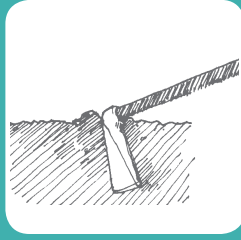
The chart below will assist you in determining desired number of trees per acre.



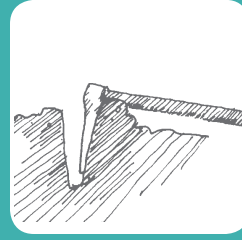
Eight Steps in Tree Planting



1 Insert hoe



2 Loosen soil



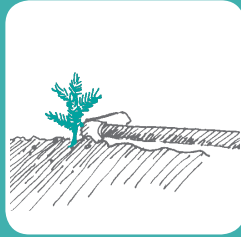
3 Pull (toward you)



4 Insert tree



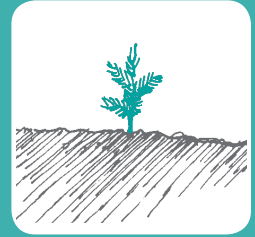
5 Cover roots



6 Cover to base

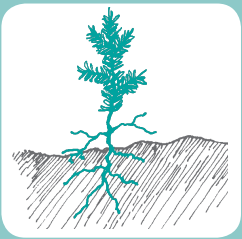


7 Pack soil

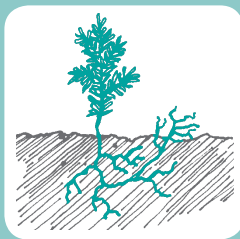


8 Correctly planted

Planting Errors



Too shallow



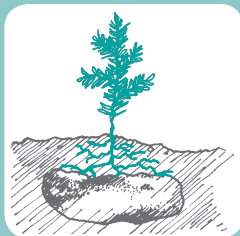
Turned up roots



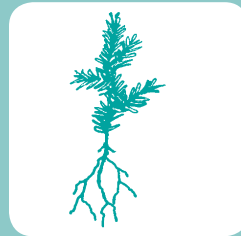
Tangled roots



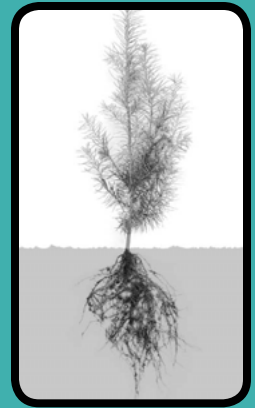
Too deep



Rock



Air pocket



CORRECT

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.

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 Plantings

On large areas, you can remove brush or hardwood competition using a crawler tractor equipped with a brush clearing blade. It may also be necessary to remove or reduce logging debris.

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 and to conserve soil moisture and nutrients for the new seedlings. 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.

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 other competitive plant growth.

Mechanical methods

— scattering, piling, chipping and burning — are commonly used to control competing vegetation in many areas.

While herbicides can also be used, you should exercise extreme care when applying chemicals to avoid damage to soils, fish, water quality or wildlife.

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 also 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 used at the time of planting.

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 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.



CORRECT

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



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



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 your WSU Extension Agent.

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 irrigation and shading may be desirable in arid conditions.

For More Help

For free on-site consultation from a DNR Stewardship Forester:

Call your DNR Region Office (see last page), or e-mail: foreststewardship@dnr.wa.gov

For ordering seedlings, contact:

Webster Forest Nursery

(360) 753-5305

Toll Free: 1-877-890-2626

Website: www.dnr.wa.gov

For advice, education and publications:

WSU Extension

Check your local county government listing.

Website: ext.wsu.edu/forestry

For forestry and agricultural assistance:

USDA Natural Resources Conservation Service

Check your local federal government listing.

This publication was prepared by:
Department of Natural Resources and
Webster Forest Nursery.

In cooperation with:
WSU Extension and USDA Natural
Resources Conservation Service.

For complete information about
Washington Administration Codes
(WACs) quoted, contact any of
the DNR region offices listed on the
back of this booklet.

For More Information

DNR OLYMPIA OFFICES

Forest Stewardship Program

PO BOX 47012
OLYMPIA, WA 98504-7012
(360) 902-1706

Urban & Community Forestry Program

PO BOX 47037
OLYMPIA, WA 98504-7037
Toll Free: 1-800-523-8733

Webster Forest Nursery

PO BOX 47017
OLYMPIA, WA 98504-7017
(360) 753-5305
Toll Free: 1-877-890-2626

Small Forest Landowners Office

PO BOX 47012
OLYMPIA, WA 98504-7012
(360) 902-1400

DNR REGION OFFICES

Northeast Region

225 S SILKE RD
PO BOX 190
COLVILLE, WA 99114-0190
(509) 684-7474

Northwest Region

919 N TOWNSHIP ST
SEDRO-WOOLLEY,
WA 98284-9395
(360) 856-3500

Olympic Region

411 TILlicum LANE
FORKS, WA 98331-9271
(360) 374-2800

South Puget Sound

950 FARMAN ST N
PO BOX 68
ENUMCLAW,
WA 98022-9282
(360) 825-1631

Southeast Region

713 E BOWERS RD
ELLENSBURG,
WA 98926-9301
(509) 925-8510

Pacific Cascade Region

601 BOND RD
PO BOX 280
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(360) 577-2025

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