Sources of Native Forest Nursery Seedlings

December 2019

 HOW TO PLANT A TREE

Cover illustration by Hugh Hayes August 1, 1914 - June 25, 2013
Following World War II Mr. Hayes worked for the Oregon State Department of Forestry in Salem, from 1945 until his retirement in 1993, drawing fire protection maps and safety cartoons, designing plans for guard stations and bridges, and illustrating field guides of Oregon trees.
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This publication is a service provided by the Oregon Department of Forestry to help meet the changing needs of family and non-industrial private forestland (NIPF) owners actively engaged in:

- Afforestation
- Reforestation
- Forest Management
- Tax Incentives
- Timber Production
- Riparian Management
- Forest Pest Management
- Watershed Enhancement
- Fish and Wildlife Habitat Improvement
- Marketing of Forestry Carbon Offsets, etc.

Published annually, this catalog helps landowners locate suitable tree stock to meet their unique and individual resource objectives.

This is just one of several valuable services that ODF provides to family and private non-industrial forestland owners. Other services include providing information and advice, technical assistance, and financial incentive guidance on: Forest Health Issues, Silvicultural Practices, and Land Stewardship Activities.

Reforestation is required under Oregon law if you harvest below stocking levels required by the Oregon Forest Practices Act. To learn more about stocking requirements or seed zone information, contact your local ODF Stewardship Forester (https://www.oregon.gov/ODF/Working/Pages/FindAForester.aspx).

In the last several years, seedling supplies have been very tight. We expect continued high demand and limited seedling supplies for those landowners who do not plan ahead. We encourage forest landowners to begin plans to secure seedlings at least 2 years before harvest is completed. This should help assure seedlings are available when needed.

Please contact individual nurseries (see pages 13-15) for stock information, current seedling inventories and ordering procedures. You can learn more about each nursery by visiting their website or contacting them directly.

Nurseries growing seedlings for Family Forest Landowners can obtain seed from the Oregon Seed Bank. The Seed Bank supports Family Forest Landowners across the state of Oregon by providing them access to superior tree seed for their reforestation needs. Seed availability is updated annually to assure that the best seed sources and most current, genetically improved seed is available. Additional information is available at: https://www.oregon.gov/odf/Working/Pages/Seed.aspx.
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Species
The common types of native forest tree species in Oregon.

Seed Zone
The area where seed was collected and can be safely outplanted. The risk of planting a seedling outside its seed zones varies depending on the species, site, climate, etc. Seed zone numbers correspond to the numbers shown on the maps on pages 16-19. Maps are provided for both seed zone classification systems commonly used in Oregon. Genetic research shows that the wider seed movement generally allowed by the 1996 seed zones poses little risk during reforestation.

Elevation Band
The elevation where seed was collected and can be safely outplanted. Some nurseries present this as a range. Others present a single elevation value, which represents the top of the elevation range where seed was collected in 500-foot increments. For example, if the elevation is noted as 1,500’, the seed came from 1,000-1,500 feet in the seed zone listed. It is important to follow elevational guidelines when selecting seed or seedlings.

Woods-Run Seed and Seedlings
Wild or woods-run seed is collected from natural forest stands in a given seed zone and elevation. While woods-run seed can produce some trees with excellent genetic characteristics, on average, trees grown from these sources will be inferior to improved seedlings derived from decades of tree improvement.

Genetically-Improved Seedlings
Formal tree improvement programs for Douglas-fir have existed for over 60 years in the Pacific Northwest. These testing programs have used traditional breeding techniques to identify appropriate seed sources and families that are widely adapted, fast-growing, have desirable growth forms, and can have improved disease or insect resistance. During the course of this testing, thousands of different families have been tested and the best families have been placed into seed orchards for seed production.

The cost of genetically-improved seedlings is often slightly higher than that of seedlings grown from wild or woods-run seed. However, the improved growth of the genetically-improved seedlings will more than offset these costs.

Above: Heavy Cone Crop on Douglas-fir at ODF’s Schroeder Seed Orchard in St. Paul, OR.
**Stock Type**

There are two basic types of planting stock: bareroot and container-grown seedlings. Bareroot seedlings are sown and grown in nursery beds, lifted, and then sold without soil on the roots. Container grown or “plug” seedlings are normally grown in a greenhouse. The container’s cavities are filled with growing medium and the seed is sown on top. Nurseries extract plug seedlings from containers before shipment.

There are many sizes and shapes of containers. Some nurseries also offer Plug+1 seedlings, which are grown in a greenhouse for 9-12 months, then transplanted into a bareroot nursery for one year.


**Age/Container**

Bareroot seedlings are typically classified by the number of years grown in the nursery or transplant bed. The first digit in “1+0,” “2+0,” “1+1,” etc., represents the number of seasons a seedling was grown in the nursery seedbed. “1+1” seedlings are two-year-old seedlings grown in a nursery bed for one season, then transplanted and grown in the nursery bed for a second season. The second digit is the number of seasons the seedling was grown in a transplant bed. “P+1” indicates a seedling was grown for one season in a container, plus one season in a transplant bed.

Container seedlings are also called “plug” seedlings. They are typically grown in a greenhouse in a variety of container sizes and extracted after one year. A styro-8 is a common container seedling size grown in a styroblock container of 80 cells with a cavity size of 8 cubic inches.

**Disease Resistant**

Disease resistant western white pine, sugar pine, and Port Orford cedar seed is available. In addition, new genetic selections of Douglas-fir selected for swiss needle cast resistance have been made and grafted into orchards. Seed from these trees is now available at the Oregon Seed Bank. More information on disease resistant pine and Port Orford cedar is available on the web page of the USDA Forest Service Dorena Genetic Resource Center (https://www.fs.usda.gov/goto/r6/dorena).

**Price**

The cost per seedling vary by species, growing method, and the genetic value of the seed used to produce the seedlings. Seedlings are commonly sold as groups, not as individual seedlings. For example, if prices are quoted as $.30 each, cost for 100 seedlings would be expressed as $30/100 or cost for 1,000 seedlings would be $300/M.
Steps in the Production of Improved Seed

Genetically improved seed is generally derived through long-standing tree improvement programs. Seed is produced in highly-managed seed orchards. These orchards are managed with the overall objective of producing heavy, consistent, predictable cone crops at young ages to rapidly make the best genetically improved seed available for reforestation.

Most seed is produced in clonal seed orchards consisting of desirable parent scion wood grafted on specially produced rootstocks. The type of production system is very analogous to fruit tree production systems where a given apple orchard may consist of different apple varieties such as golden delicious, red delicious, or honeycrisp apple varieties. Clonal seed orchards are much the same. Scionwood is grafted upon the selected rootstocks either under greenhouse conditions or directly in the field. If grafted in the greenhouse, grafted trees are generally grown for a period of 6 to 10 months before being planted in the field.

Once production of greenhouse grafted trees is completed, trees are shipped to the orchard site and planted once field conditions are suitable for establishment.

Orchard sites are typically intensively managed to promote rapid establishment and growth and high survival. Preplant site preparation and chemical site preparation treatments are used to eliminate competing vegetation. Soil physical conditions are improved with subsoiling and disking to create conditions favoring root growth. Planting usually occurs in October once fall rains have recharged soil moisture. In the second growing season, herbicide treatments are applied to the tree rows to direct water and nutrient resources to the new orchard trees rather than to competing vegetation. Trees are staked and pruned to promote rapid upright growth. During drought conditions (typically June until September) in the first several growing seasons, trees are watered to reduce stress and promote growth. In the second and third growing season, nutrient amendments are added as needed to promote growth and accelerate flowering.
Given good growing conditions, trees are often large enough to enter into their reproductive phase by the 5th or 6th growing season. To assure early and consistent cone crops, young trees are stimulated to produce early cone crops through a combination of treatments including partial stem girdling and injection of gibberellic acid. These treatments alter plant hormone levels and carbohydrate levels and flowering typically occurs in the next spring.

Douglas-fir cones typically ripen four to five months after flowering. For maximum seed yields, cones are harvested when seed are fully ripe, but before the cones begin to flare and disperse their seeds. After picking, cones are placed in well-ventilated drying sheds to reduce their moisture contents. After several weeks of drying, cones are shipped to processors and seed is extracted and returned. Proper storage conditions are important for long-term seed storage. Douglas-fir, ponderosa pine, and western hemlock seeds can be stored for decades without losing vitality.

To assure high seed yields, cone crop must be protected from damaging insect pests. To reduce seed damage, registered insecticides are applied in the spring.
Flowering and Cone Development Processes in Douglas Fir

Above: Immature male and female flowers on Douglas-fir. At this stage, female flowers are not receptive and male flowers will not yet shed pollen.

Above: Mature male and female flowers on Douglas-fir. At this stage, female flowers are fully receptive and pollination can take place. Male flowers are actively shedding pollen.

Above: Mature Douglas-fir cones. At this stage of development, cones scales have opened and cones are actively shedding mature seeds.

Above: Fertilized Douglas-fir cones. At this stage of pollination is complete and cones become pendant. Male flowers are no longer shedding any pollen.
The Role of Tree Improvement to Assure Healthy, Productive Forests

When nurseries produce seedlings or landowners purchase these seedlings, one of the most important considerations is the genetics of the seed. The seed used to produce these seedlings can vary widely from wild seed collected from parents of unknown genetic composition to highly controlled pollinations between selected parents. To facilitate the deployment of genetically superior forest tree species, tree improvement programs in the Pacific Northwest were initiated in the late 1950’s. Of the commercially important timber species, tree improvement of Douglas-fir was the first to begin and is generally the most advanced program. Other commercially important tree species with active and long-standing tree improvement programs include western hemlock, western red cedar, and ponderosa pine.

Benefits of Improved Seed

There are many potential benefits of using genetically improved seed. Production of this seed under controlled orchard conditions is generally far more predictable than relying upon wild seed collections. Under natural conditions, seed production can be highly variable and bumper seed crops often occur at erratic intervals interspersed with low seed production, and even years with complete crop failures. In addition, management of wild seed production areas and collection of seed from these stands can be challenging. These factors combined with uncertain growth, form and disease and insect susceptibility of these wild seed collections make reliance on these sources problematic. While wild seed collections once comprised almost all of seedlings planted in the Pacific Northwest, aggressive tree improvement efforts and the development of seed orchards to produce improved seed has dramatically changed the genetics of the trees being deployed. In the last 10 years, approximately 95% of the Douglas-fir seedlings produced in the Pacific Northwest for deployment west of the Cascades have been derived from some level of tree improvement with only 5% consisting of woods run seed collections.

Specific advantages of improved seed include increased growth, improved insect and disease resistance, and for some seed sources, increased resistance to animal browse. Improved seed of Douglas-fir, western hemlock, and western red cedar selected for increased productivity is widely available for deployment in western Oregon. Disease resistance is also an important consideration for western white pine, sugar pine, and Port Orford cedar. For sugar and western white pine, pine blister rust is an important disease that can kill or damage these species. Breeding work with both species has led to the development and production of seeds that will produce seedlings with increased levels of resistance to the disease. Resistance to Phytophthora lateralis, a root rot disease, is an important trait in Port Orford cedar that the USDA Forest Service has developed in their selections. The Oregon Seed Bank is able to purchase seed from these selections and this seed is made available to Family Forest Landowners through the Seed Bank.
How Much Gain Can Be Achieved Through Deployment of Improved Seed?

Each cycle of a tree improvement program would be expected to shift the curve forward for the traits of interest. The relative proportion of good and outstanding trees relative to poor trees would increase. This shifting of performance level would be expected to occur in each subsequent tree improvement cycle. This performance is illustrated in the figure below. In this case, each shift represents improvements from woods-run seed collections to first generation seed orchards to second generation seed orchards.

The level of improvement that occurs in each cycle of tree improvement is important to all forestland managers and owners. These gains can be quantified for characteristics such as height, diameter, or volume growth. Ye and Jayawickrama (2006) estimated that deployment of Douglas-fir derived from first generation seed orchards would result in volume gains of approximately 50% at age 15 compared to plantations established using woods-run seed. They further estimated that use of second generation seed would result in further volume gains of 25% compared to first generation seed and use of third generation seed could result in further volume gains of approximately 22% compared to second generation seed. Volume gains of this magnitude can illustrate why the overwhelming percentage of Douglas-fir seedlings planted in the Pacific Northwest are derived from improved seed.

Graphic representation of the gains possible through each round of tree improvement from woods-run seed to 1st generation selections to 2nd generation selections. Each round of tree improvement results in better stands being planted on the landscape.
How Much Does Genetically Improved Seed Cost?

While genetically-improved seed is often more expensive on a pound-to-pound basis, in actuality, improved seed represents a relatively small component of the entire cost of reforestation. Woods-run Douglas-fir typically sells for $75 to $150 per pound when it can be obtained for a given deployment area. Genetically improved Douglas-fir seed can cost between $300 and $1,200 per pound depending upon level of tree improvement and seed scarcity. While this seems dramatically higher, there are approximately 40,000 Douglas-fir seeds per pound. Using these figures, unimproved Douglas-fir seed will cost 0.19¢ to 0.38¢ per seed ($1.90 to $3.80 per thousand seeds). In comparison, improved Douglas-fir seeds will cost 0.76¢ to 1.50¢ per seed ($7.60 to $15.00 per thousand seeds). Compared to total reforestation costs, the percentage cost increases attributable to use of improved seed is even lower. Given the large growth increases attributable to improved genetics, more rapid site occupancy and grown closure, and other potential positive attributes such as increased insect or disease resistance, use of genetically superior seed sources are one of the best options available when reforestation decisions are being made.

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To facilitate the deployment of genetically superior forest tree species, tree improvement programs in the Pacific Northwest were initiated in the late 1950’s. Tree improvement of Douglas-fir was the first to begin and is generally the most advanced program. Western hemlock is at a similar stage of development. In the last few years, approximately 95% of the trees planted in the Pacific Northwest have been derived from orchard seed produced in conjunction with an established tree improvement programs. Seed of many of our major timber species is being produced in a combination of 1\textsuperscript{st} and 2\textsuperscript{nd} generation orchards. Currently, 1\textsuperscript{st} generation seed orchards are producing the bulk of the seed utilized, but younger 2\textsuperscript{nd} generation orchards are beginning to produce seed and their production capacities will increase each year. Deployment of seedlings produced with 2\textsuperscript{nd} generation seed will become increasingly more important.

While seed production from the 2\textsuperscript{nd} generation orchards is increasing, efforts are underway to further improve tree characteristics with 3\textsuperscript{rd} generation breeding programs. These 3\textsuperscript{rd} generation breeding programs are well-advanced for Douglas-fir and western hemlock and the first 3\textsuperscript{rd} generation progeny tests have been established for these species. These are significant breeding efforts and while the first 3\textsuperscript{rd} generation progeny tests have been established, breeding efforts continue to complete the 3\textsuperscript{rd} cycle breeding programs. For western Oregon, major 3\textsuperscript{rd} cycle Douglas Fir tree improvement programs include the North Coast, South Central Coast, CASTIC (Cascade Tree Improvement Cooperative), ROSETIC (Roseburg Tree Improvement Cooperative, and MEDTIC (Medford Tree Improvement Cooperative) Tree Improvement Cooperatives. Together, these cooperatives cover much of western Oregon.

Although the specific details of each of these cooperative breeding cooperatives do differ, we can illustrate some of the broad details for breeding for the North Coast Douglas-fir Breeding Cooperative. This is a large and comprehensive breeding effort. All this work is conducted using traditional tree breeding techniques. No genomic modification techniques are being utilized. Some of the traits that are being improved are adaptability, increased growth rates, increased insect and disease resistance, and increased wood quality. The total breeding program calls for approximately 800 successful crosses to be made. This comprehensive breeding effort includes at least 12 separate entities including private industrial, state, federal, and university agencies. The land base currently covered in this breeding effort encompasses approximately 950,000 acres.

Breeding efforts are based on 500 1\textsuperscript{st} and 2\textsuperscript{nd} generation parents being bred in a subline-based breeding program consisting of 26 separate sublines. As of the end of 2018, over 400 crosses have been completed. An additional 225 crosses were made in the spring of 2019. Breeding is expected to be completed in 2021. The first progeny tests were established in January 2019. These tests are expected to be measured at ages 7 and 11 and following the measurements and analysis, the best trees from the best crosses will be identified. Scion from these selected trees will be collected and grafted on suitable rootstock and form the basis for the 3\textsuperscript{rd} generation Douglas-fir seed orchards throughout western Oregon.
Young 3rd cycle Douglas-fir breeding orchard. Trees with white breeding bags on the branches are trees on which breeding will take place. The breeding bags contain branches that have female flowers present. Male flowers have been removed from the branches. When the female flowers are fully receptive, pollen from known male parents will be injected into these bags to produce controlled crosses with known female and male parentage.

Breeding bag with controlled crosses maturing. When cones are fully mature, the cones will be collected to produce seed to grow the next series of progeny tests for the cooperative members.

Map showing the approximate coverage areas for the North Coast, South Coast, CASTIC, ROSETIC, and MEDTIC tree breeding cooperatives in western Oregon.
In the last few years, the supply of seedlings has been tight and landowners that need seedlings should begin planning to secure these seedlings 2-3 years in advance of anticipated planting time. The following list of nurseries typically grow seedlings for reforestation and contacting these nurseries is a good starting point to secure planting stock. The Oregon Department of Forestry no longer runs a State Nursery to produce seedlings, but the Department does offer seed for sale through the Oregon Seed Bank. Each year the Seed Bank updates its listing of seed sources and makes this seed available to nurseries and individuals needing to produce seedlings for reforestation. The Seed Bank often has the most advanced genetic sources of seed available and this availability allows Family Forest Landowners access to the latest developments through tree improvement programs.

**Aldrich Berry Farm & Nursery, Inc.**
190 Aldrich Rd
Mossyrock, WA 98564-9609
**Phone:** (360) 983-3138
**Fax:** (360) 983-8588
**Email:** galdrich@tds.net
**Website:** aldrichberryfarm.com

**Drakes Crossing Nursery**
19774 Grade Rd SE
Silverton, OR 97381-9425
**Phone:** (503) 873-4932
**Fax:** (503) 873-4933
**Email:** info@drakescrossingnursery.com
**Web:** drakescrossingnursery.com

**Althouse Nursery**
8576 Rogue River Hwy
Grants Pass, OR 97527
**Phone:** (541) 592-2395
**Email:** plants@althousenursery.com
**Website:** althousenursery.com

**Fernwood Nursery**
909 S. Stage Rd
Medford, OR 97501
**Phone:** (541) 857-8577
**Fax:** (541) 857-8577
**Email:** fernwoodnursery@yahoo.com

**Brooks Tree Farm, Inc.**
9785 Portland Rd NE
Salem, OR 97305-9721
**Phone:** (503) 393-6300
**Fax:** (503) 393-0827
**Email:** office@brookstreefarm.com
**Website:** brookstreefarm.com

**Fir Run Nursery**
17901 150th Ave E #765
Orting, WA 98360
**Phone:** (253) 221-3238
**Email:** firrun@msn.com
**Web:** firrunnursery.com

**Champoeg Nursery, Inc.** (shrubs)
9661 Yergen Rd. NE
Aurora, OR 97002
**Phone:** (503) 678-6348
**Fax:** (503) 678-4348
**Email:** info@champoegnursery.com
**Website:** champoegnursery.com

**Heritage Seedlings, Inc.** (shrubs)
71st Ave. SE
Salem OR 97317
**Phone:** (503) 585-9835
**Email:** sales@heritageseedlings.com
**Web:** heritageseedlings.com
Sources of Native Forest Nursery Seedlings

IFA Nurseries, Inc.
9450 SW Commerce Circle, Ste 370
Wilsonville, OR 97070
Cell: (541) 556-8907
Email: sakehurst@ifanurseries.com
Web: ifanurseries.com

Kintigh’s Mountain Home Ranch
38865 E. Cedar Flat Rd.
Springfield, OR 97478
Phone: (541) 746-1842
Email: KMHRtree@aol.com
Web: kintighs.com

Klamath Forest Nursery
Green Diamond Resource Co.
7680 Happy Hollow Lane
Bonanza, OR 97623
Phone: (541) 545-6432
Fax: (541) 545-6886
Email: Jeff.Dixon@GreenDiamond.com

Lava Nursery, Inc.
5301 Culbertson Dr.
Parkdale, OR 97041
Phone: (541) 352-7303
Email: lavanursery@aol.com

Lewis River Nursery
2821 NE 434th St
Woodland, WA 98674
Phone: (360) 225-6455

Lewis River Reforestation
1203 NW Hayes Rd.
Woodland, WA 98674
Phone: 360-225-6357
Fax: 360-225-1307
Email: bruces@lrrinc.com
Web: www.lrrinc.com

Pitkin Forest Nursery, Univ of Idaho
PO Box 441137
Moscow, ID 83844-1137
Phone: (208) 885-3888
Fax: (208) 885-6564
Email: seedlings@uidaho.edu
Web: uidaho.edu/cnr/cfnsr

Plant Oregon (shrubs)
8677 Wagner Creek Rd
Talent, OR 97540
Phone: (541) 535-3531
Fax: (541) 535-2537
Email: dan@plantoregon.com
Web: plantoregon.com

Plants of the Wild
P.O. Box 866
Tekoa, WA 99033-0866
Phone: (509) 284-2848
Fax: (509) 284-6464
Email: Kathy@plantsofthewild.com
Web: www.plantsofthewild.com

The Plantworks, LLC
69465 Lantz Lane
Cove, OR 97824-8208
Phone: (541) 963-7870
Email: plantworks@oregontrail.net
Web: theplantworksllc.com
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PRT Oregon
31783 South Meridian Rd.
Hubbard, OR 97032
Phone: (503) 651-3266
76928 Mosby Creek Rd.
PO Box 1060
Cottage Grove, OR 97424
Phone: (541) 942-5516
Email: Tiffany.Roddy@prt.com
Web: prt.com

USDA Forest, J Herbert Stone Nursery
2606 Old Stage Rd.
Central Point, OR 97502
Phone: (541) 858-6100
Email: jbjustin@fs.fed.us
Website: https://rnger.net/resources/directory/usdaforestservice-jherbertstonenursery

WACD Plant Materials Center
16564 Bradley Rd
Bow, WA 98232
Phone: (360) 757-1094
Email: pmcsales@gmx.com
Website: wacdpmc.org

Grand fir (Abies grandis) 1+0 container seedling.

Saplings LLC (consultant)
16464 SW Brookman Rd.
Sherwood, OR 97140
Phone: (503) 805-1222
Email: mike@mysaplings.com
Web: mysaplings.com

Webster Forest Nursery, WA DNR
9805 Blomberg St SW (Physical Address)
MS 47017 (Mailing Address)
Olympia, WA 98504-7017
Phone: (877) 890-2626
Fax: (360) 664-0963
Email: bill.taylor@dnr.wa.gov

Willamette Seedling Nursery
23625 S. Mulino Rd
PO Box 728
Canby, OR 97013
Phone: (503) 263-6850
Fax: (503) 263-3872
Email: cparsons@canby.com

Scholls Valley Native Nursery, LLC
4036 NW Half Mile Lane
Forest Grove, OR 97116
Phone: (503) 470-0420
Fax: (503) 624-2766
Email: sales@schollsvalley.com
Web: schollsvalley.com

Tribal Nursery Plants
46411 Ti’mine Way
73820 Highway 331
Pendleton, OR 97801
Phone: (541) 278-8525
Email: tribalnativeplants@gmail.com

Silvaseed Company
P.O. Box 118
Roy, WA 98580
Phone: (253) 843-2246
Fax: (253) 843-2239
Email: inquiries@silvaseed.com
Website: silvaseed.com

Willamette Seedling Nursery
23625 S. Mulino Rd
PO Box 728
Canby, OR 97013
Phone: (503) 263-6850
Fax: (503) 263-3872
Email: cparsons@canby.com

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Seed Zone Maps

- Western Red Cedar
- Western Hemlock
- Sitka Spruce
- Grand Fir
- Incense Cedar
- Sugar Pine
- Douglas Fir
- Ponderosa Pine
- Western White Pine
Seed Zone Maps

Port-Orford-cedar JR13 Breeding Zones

Legend

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Source: [Map Title]
**Seedlings:**
- Forest Seedling Network (FSN)
  http://www.forestseedlingnetwork.com
- Saplings—Seedling Orders for Small Landowners
  http://www.mysaplings.com/
- Private Forest Lands Network—a refrigerated storage facility located in La Grande, Oregon. This facility can be used to store forest seedlings and shrub vegetation for your stream enhancement, riparian plantings, and wind break projects.
  https://www.facebook.com/PrivateLandsForestNetwork

**Seed:**
- Oregon Seed Bank
  The Seed Bank supports Family Forest Landowners across the state of Oregon by providing them access to superior tree seed for their reforestation needs.
  https://www.oregon.gov/ODF/Working/Pages/Seed.aspx

**Publications:**
- Guide to Reforestation in Oregon, by Robin Rose and Diane Haase, 2006, OSU, OFRI, ODF

**Websites:**
- Know Your Forest—Resources for Small Landowners
  http://www.knowyourforest.org/
- Oregon Department of Fish & Wildlife
  https://www.dfw.state.or.us
- Oregon Department of Forestry, Private Forests Program
  https://www.oregon.gov/ODF/Working/Pages/default.aspx
- Oregon Association of Nurseries—Nursery Guide
  http://nurseryguide.com/
- Oregon Forest Industry Directory
  http://www.orforestdirectory.com/
- OSU Forestry Extension Program
  http://extensionweb.forestry.oregonstate.edu/index.php
- Oregon Watershed Enhancement Board
  https://www.oregon.gov/OWEB
- USDA Forest Service Dorena Genetic Resource Center
- USDA Natural Resources Conservation Service
  http://www.or.nrcs.usda.gov/
- ODF Stewardship Forester Listing Lookup
  https://www.oregon.gov/ODF/Working/Pages/FindAForester.aspx
Reforestation...

Planning a new forest.

**Step 1: Planning**

Planning to reforest your property should take place before harvest begins. Site conditions will determine which seedling species and seedling size to order.

**Legal Requirements**

The landowner must replant within 24 months after a clear-cut or heavy partial cut. Planting requirements range from 200 trees per acre for most of western Oregon to 100-125 trees per acre for dry pine sites in eastern Oregon. By the end of the sixth year, the trees must be “free-to-grow” (healthy and above surrounding vegetation).

**Step 2: Ordering**

Order seedlings no later than the fall before planting season. Select the proper seedling, species, seed zone, and size for each site. Douglas-fir (western Oregon) and ponderosa pine (eastern Oregon) are common species, but there is a lot of variation. Please contact your local ODF office for information specific to your site.

**Step 3: Planting**

Once the site is prepared and the seedlings have been ordered, planting can take place from December through March (later for snow-bound sites). Proper handling of seedlings from the nursery through planting is critical, as is the planting technique. Plant more than the minimum number of trees per acre to allow for seedling losses.

**Reforestation Crews** can be hired to reforest your property. Contact your local ODF office for a list of local crews.

**Step 4: Free-to-grow**

Inspect the seedlings each year to ensure that they are alive and are free-to-grow. Vegetation control and additional tree planting may be necessary for the next 5 years after planting.

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**Additional Resources:**

- **Reforestation Guidance**
  https://www.oregon.gov/ODF/Working/Pages/Replanting.aspx

- **Oregon State University Forestry Extension**
  http://extensionweb.forestry.oregonstate.edu/index.php

- **Forest Seedling Network**
  http://www.forestseedlingnetwork.com

- **Seedling Orders for Small Landowners**
  http://www.mysaplings.com/