

Evaluating Sites for Planting Hardwoods in the Pacific Northwest

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Many foresters who used to plant only conifers are now planting or considering planting hardwoods. The increased interest in hardwoods may be due to increased stumpage prices for alder or to interest in utilizing other species for problem areas (wet sites or those with *Phellinus* root rot) or for special uses such as wildlife habitat or biodiversity. Hardwoods have a well-deserved reputation for being picky about their site conditions, though, so it's important to match the right species to the right site.



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First, ask yourself why you want to plant a particular species. You can get alder to grow on many Northwest sites (especially on low- to mid-elevation sites west of the Cascades) as long as they are not excessively dry or cold, but if you want to produce high-quality sawlogs—the product commanding the high stumpage prices—you will need to select a site that is very productive.

The best alder sites will be low elevation, on a floodplain, terrace or lower-slope position, receive at least 15 inches of rain from April 1 through September 30, and not be subject to any special hazards such as exposure to high winds or in a frost pocket.

Additional Resources

Additional information on hardwood site quality is available at this website: www.fs.fed.us/pnw/olympia/silv/hardwoods/.

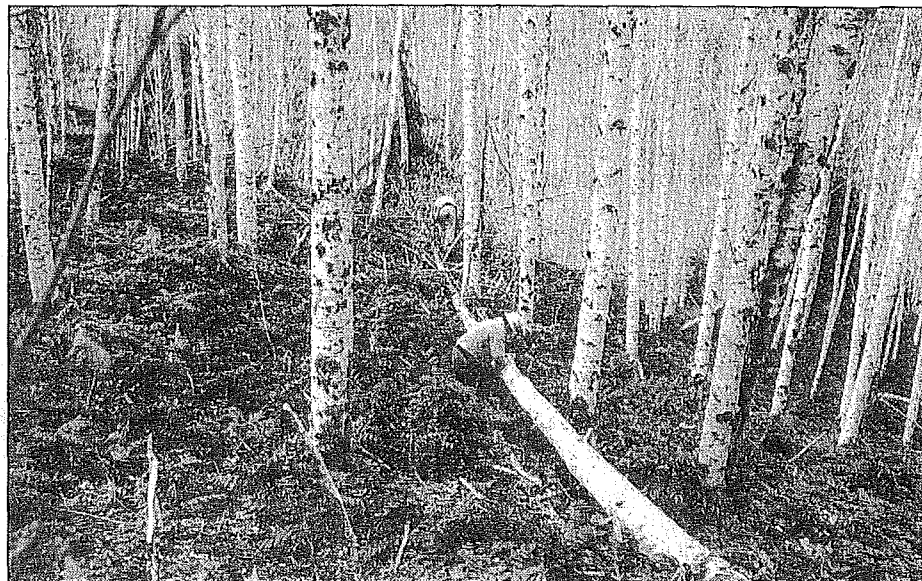


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Researchers fell alder stems to look at past growth rates and compare growth to soil and site characteristics.

Alder shoots are not very strong and wind can break tops or branches resulting in trees with poor form and reduced height. Alder is susceptible to both late fall and early spring frosts, so care must be taken to ensure the site is not in an area where cold air will accumulate. It is important to remember that alder is a riparian and upland tree species—not a wet-site species. Looking at high-value alder stands on sites in your area and talking to local log buyers about their observations may be very useful.

In terms of soil physical properties, the very best alder sites have deep, moist but well drained silt loams with access to a summer water table at 5 to 12 feet. They also have a pH around 5, low bulk density, moderate organic matter in the surface soil, and no or minimal horizon development associated with leaching (see additional resources for specifics on these factors). Because alder is a nitrogen-fixing species, the

amount of nitrogen on the site isn't very important (nitrogen is often limiting on many northwest soils for other species). However, just because alder is a nitrogen-fixer, that doesn't mean it will grow well on all sites low in nitrogen as the sites may be too droughty, cold or have other negative attributes. In addition, soils low in phosphorus can limit alder growth presumably by affecting the amount and function of the nitrogen-fixing nodules on alder roots.

Sometimes people choose to plant alder because the site has had problems with conifer mortality caused by *Phellinus* root rot (all hardwoods are immune to this problem). Alder may be a reasonable species to plant on some of these sites, but you should not make the assumption that just because the site has laminated root rot it will be a good site for alder growth. In addition, while alder is immune to laminated root rot, it is susceptible to other conifer root rots such as annosus and armillaria root diseases.

Hybrid poplar (and our native black cottonwood) has many of the same site requirements for a productive site as does red alder—deep, moist but well drained sites. But due to their tremendous growth potential on the best sites, it is even more important that site con-

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ditions be carefully evaluated as the fall down in growth with selecting the wrong site can be very dramatic. In addition, the impressive early growth that has been documented for hybrid poplar is only obtained with excellent site preparation and early tending practices. West of the Cascades, the best hybrid poplar sites are in riparian areas or flood plains. Hybrid poplar can also be grown on the eastside if it is irrigated, and impressive yields can be obtained on these warmer sites as long as water and nutrients are provided in abundant quantities. Poplar has been planted very successfully on former agricultural sites as those sites often are very suitable for the equipment used for tending and harvesting short-rotation woody crops. However, some former agricultural sites are not suited to poplar culture due to factors such as high pH, wind exposure or frequency of flooding.

There have been substantial changes in the forest products industry in recent years; thus, land managers should verify where mills are located that utilize poplar and if those mills are likely to be interested in the raw material in the future and if so, if they have cost-share programs to work with potential growers.

Although we have briefly discussed alder and hybrid poplar, many other species of hardwoods can be planted or managed on appropriate sites. Bigleaf maple, Oregon ash, Pacific madrone and Oregon white oak are all Northwest hardwood species that have considerable wildlife value and may also produce wood that can be sold. Information on the ecology of these species is available from many sources and can serve as a guide to the types of site conditions that would be appropriate. County or other soil surveys include information on woodland suitability although the amount of information on hardwoods is fairly limited for most soil series.

You may want to start with a small planting to verify you have chosen the right site, planting stock and tending practices. For most species, a fairly local seed source is a safe bet (for large projects you may have to contract the production of the planting stock). Some nurseries have expanded their production to include more species,

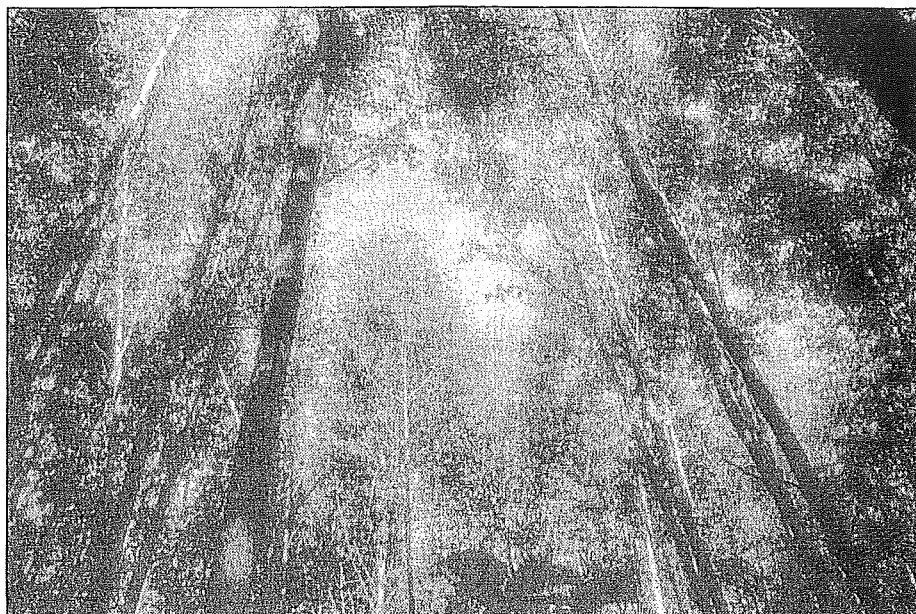


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Examination of local alder stands can help foresters determine which site conditions are associated with good growth and find or identify conditions that may cause problems.

but have not worked out appropriate cultural practices for new species, so it is wise to specify or inspect the planting stock to ensure it has a good root system and that the top and root system look balanced.

For hybrid poplar, clonal plantings will be made. The selection of the appropriate clone is best made after some discussion with local foresters who have had experience with specific clones. For example, some productive clones are more susceptible than others to wind damage and would be a

poor choice on windy locations. ♦

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