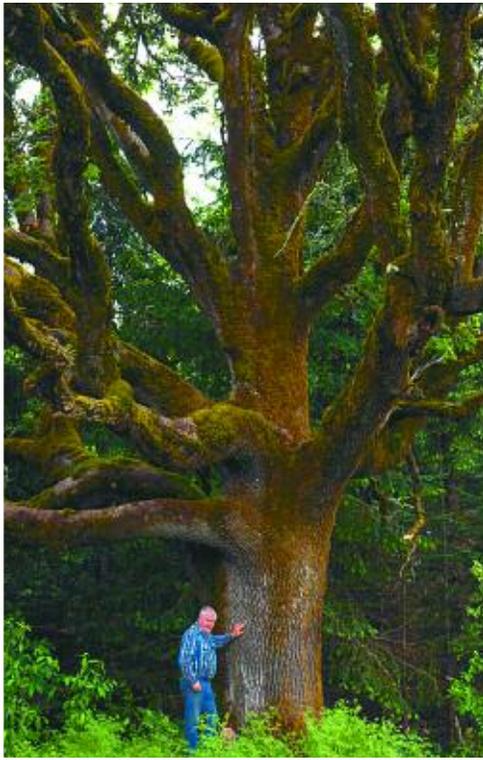


# Northwest Woodlands

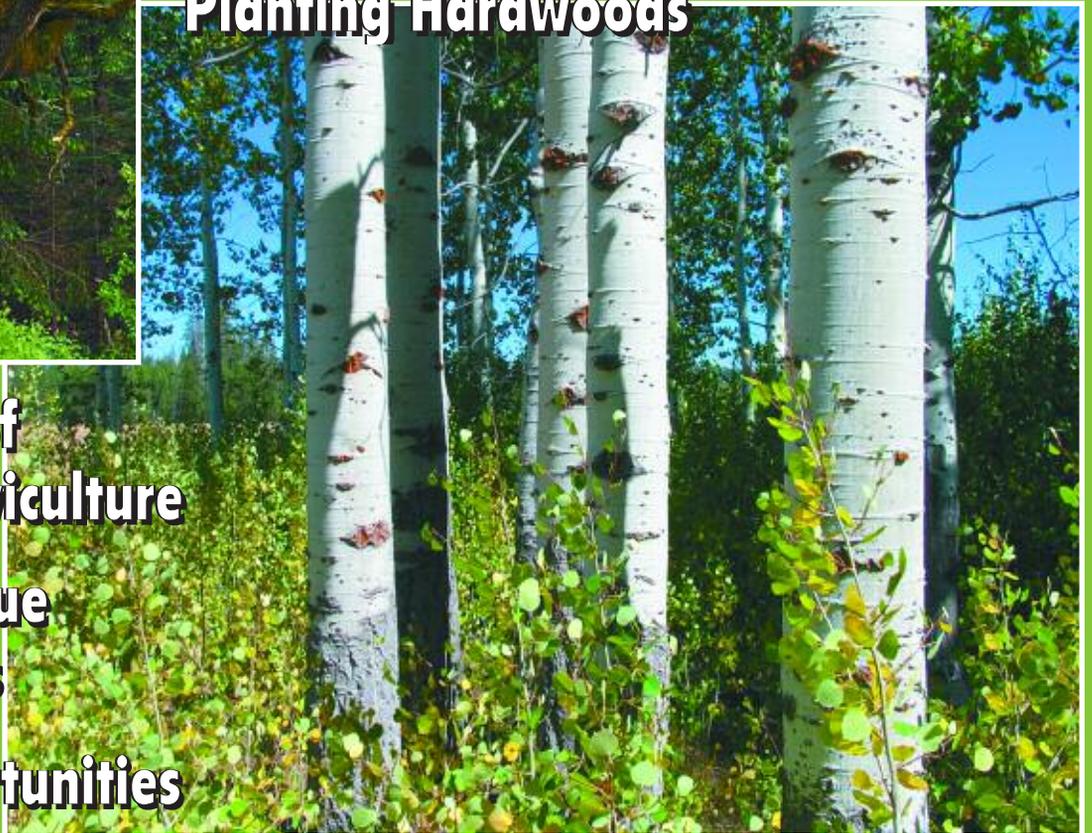
A Publication of the Oregon Small Woodlands, Washington Farm Forestry, Idaho Forest Owners & Montana Forest Owners Associations



## HARDWOODS

### Hardwoods Are Growing Up and Becoming Profitable

### Evaluating Sites for Planting Hardwoods



### The Practice of Red Alder Silviculture

### Ecological Value of Hardwoods

### Market Opportunities

PRSR STD  
U.S. POSTAGE  
PAID  
PORTLAND, OR  
PERMIT NO. 1386

Northwest Woodlands  
4033 S.W. Canyon Rd.  
Portland, OR 97221

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OSWA President Ken Faulk shows off his prized oak tree. Photo courtesy of Robert Petit.

Quacking aspen is slowly being restored through active management. Photo courtesy of Darin Stringer.

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Northwest Woodlands is published quarterly by the World Forestry Center for the Oregon Small Woodlands Association, Washington Farm Forestry Association, Idaho Forest Owners Association and Montana Forest Owners Association.

Other than general editing, the articles appearing in this publication have not been peer reviewed for technical accuracy. The individual authors are primarily responsible for the content and opinions expressed herein.

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# Hardwoods are Growing Up and Becoming Profitable to Family Forest Owners

By **DAVID SWEITZER**

**W**estern hardwoods provide a special niche in the management plan of the smaller landowner. But you don't have to be a "forest landowner" to manage western hardwoods for profit. Some western hardwood species are suitable for plantation management on agricultural land, too.



With hardwood forest products becoming increasingly more important to both the local and global economy, we hope you will enjoy this issue of *Northwest Woodlands*. This issue will look at evaluating sites for planting hardwoods, ecological aspects of hardwood stand management, hardwood growth and yield, alder silviculture and important information on other western hardwood species.

This interest in western hardwoods had simple beginnings. The charter members of what is now known as the Western Hardwood Association (WHA) were maligned with eradication of a species (red alder) that provided them a living. Foresters throughout the region were using any means available to eliminate what was known as a "weed"



*Alder plantation at one year.*

tree. Bulldozing, burning and spraying were common techniques used to make way for Douglas-fir.

More than 50 years later there are still a few who would like to see green conifers the year around and not be bothered by deciduous hardwoods. As formidable as was the effort to eradicate the alder, it still persisted and is now gaining favor among foresters. Alder is the first to sprout after a fire or other disaster. It is a prolific contributor to the biodiversity of the forest. Alder fixes nitrogen in the soil and is immune to the effects of root rot and Swiss needle cast. One short rotation of alder will cleanse the soil of these diseases that affect many coniferous species.

In 1990, the WHA, which is comprised of a voluntary membership, approached the Washington State legislature to form a Washington Hardwoods Commission (WHC). The WHC would have a similar status as other commodity commissions

such as apples and sheep. This commission would gain a valuable presence in the forest products industry by being authorized by the state legislature.

By 1991, and after two legislative sessions, the legislature authorized the formation of the WHC as a commodity commission. No state funds are used to sustain the WHC. Each company that changes the round form of the Washington grown log or ships it out of Washington submits a quarterly report and pays a fee based on volume. The landowner generally is not obligated to this "report and pay" procedure; rather, this is the responsibility of the buyer who will process the log or export it from Washington.

WHC works closely with agencies, associations and committees to affect changes that would help the small landowner and the forest products industry. The commission has been an advocate for riparian research on

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habitat, fish and water quality, growth and yield research and modeling, forest practice plan simplification through alternate plans, sustainable forestry, hardwood growing stock inventory, and harvest and production data.

Western hardwood species include alder, bigleaf maple, white poplar, tanoak, white oak, pacific madrone, ash, birch, black oak, black walnut and chinquapin. The first three comprise approximately 90 percent of the total volume of approximately 400 million board feet (mmbf) projected for 2009. Western hardwoods are used for furniture, cabinets, pallets, flooring, decorative additions to homes and offices, and specialty products throughout the world.

In 2000, alder logs surpassed Douglas-fir logs in price for the first time. This trend is continuing today and is projected to continue in the future.

About 26 percent of the alder is grown in riparian zones, which is unavailable because of ever-widening buffer zones to protect fish and wildlife. The remainder is grown below 1,500 feet in elevation and is subject to forest practices rules and regulations that restrict its harvest. All this leads to a reduced supply in an increasing demand climate. Although 2008 posed a severe challenge for the forest products industry, we are hopeful that better times are just around the corner and hardwood and softwood markets will rebound.

Better silvicultural techniques coupled with intensive management may help assure an adequate supply of alder in the future. The Hardwood Silviculture Cooperative based at Oregon State University has been intensively managing hundreds of test plots for nearly 17 years. Variables in the plots include site preparation, spacing, pruning and thinning. Height and dbh (diameter at breast height) measurements are also taken. This data, along with taper equations and standardized data from other

sources, form the basis for an alder growth and yield model.

Also on the horizon is the possibility of a better alder log. Research is currently being conducted to develop superior seedlings. Many feel this will lower the rotation from 30 years to perhaps 20 years or lower, while improving the quality of the log to increase yield. GreenWood Resources and other major landowners have test sites in Oregon and Washington where this research is being conducted.

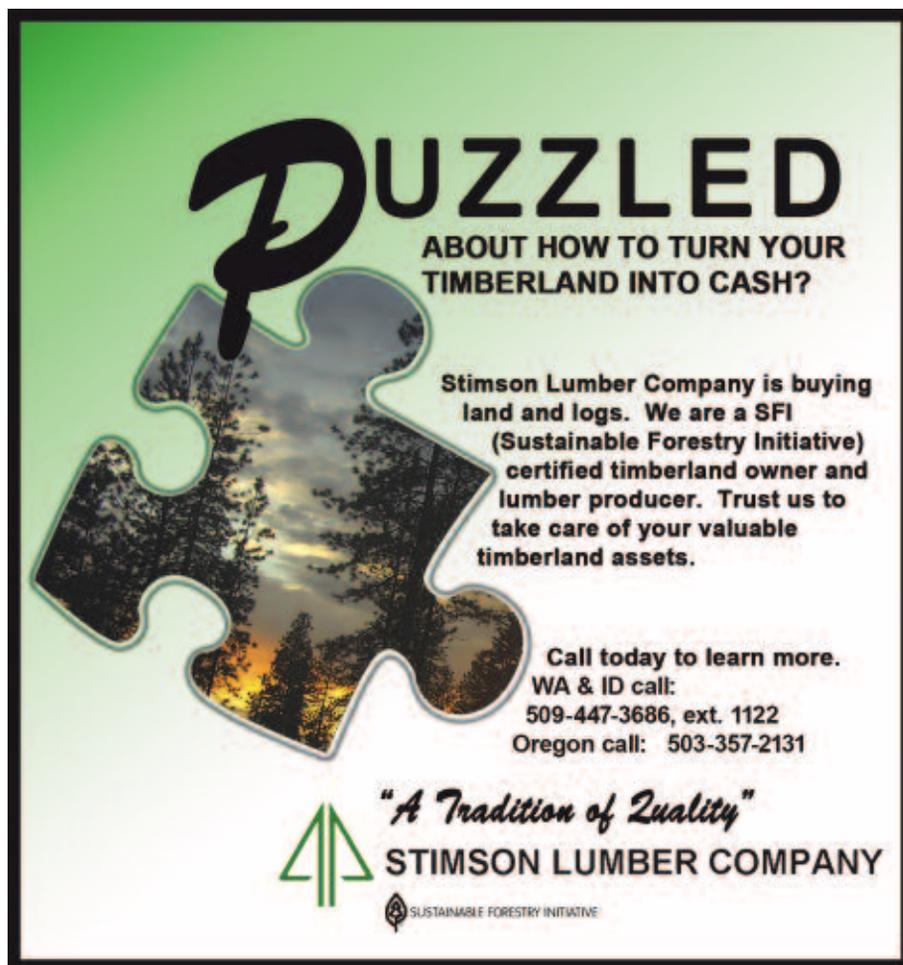
Many also feel that alder is destined to be grown on plantations where variables can be controlled. These plantations would likely be agricultural sites. If rules could be changed to reflect the rotation on agricultural land of 12 and 15 years to 20 years, alder could be included under the less restrictive agricultural rules rather than the forest practices rules. Oregon's legislature has been

considering changing the rules to accommodate the 20-year crop rotation.

Here is one logical scenario and profit potential: Harvest every 20 years with a yield of 20 mbf per acre of sawlogs, after logging and replanting costs, the net to the landowner could be as much as \$7,500 per acre.

Now is the time to become proactive in your family forest management plan: 1) manage the hardwoods now on your land; 2) prepare to plant and manage hardwoods; and 3) enjoy the income in your family's lifetime for many of the short-rotation hardwoods. ■

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# The Practice of Red Alder Silviculture

By **ALEX DOBKOWSKI**

**R**ed alder is a valuable hardwood species that competes well with many other hardwood species in the marketplace for the production of lumber and veneer. Lower grade alder logs have value as a desirable pulpwood species. Because of the expectation of a continuing strong hardwood industry in the Pacific Northwest, some landowners are investing in growing red alder sawlogs to provide future raw material for that industry. This article will describe red alder plantation silviculture as practiced on thousands of acres of industrial forestlands in southwest Washington.



## Regeneration

**Site preparation.** Heavy first- and second-year weed competition, including herbaceous weeds, has been shown to be detrimental to red alder survival and growth. For practical purposes, all broadcast herbicide control measures must be taken prior to planting. Only Atrazine 90 WDG (Loveland Products; Washington State only), Accord Concentrate (DOW) and Escort (DuPont) are labeled for use on red alder (follow label instructions). Cumulative vegetation ground cover in the first growing season of less than 10-15 percent is desirable for rapid tree growth and stand establishment. Sites that have aggressive, heavy weed invasions or are dominated by salal are extremely difficult to regenerate because of the ineffectiveness of herbicides in reducing competition to low levels in these situations. Scarification that exposes mineral soil (when combined with a soil residual herbicide) can increase survival and growth when heavy slash/forest floor is present.

**Planting.** Planting densities must be high enough to achieve the following: (1) quickly occupy the site to capture early height and stem diameter gains; (2) keep branch diameters in the first log small and promote rapid crown recession; and (3) provide a high enough thinning selection ratio to weed out damaged and poorly formed stems. Planting 540 to 680 trees per acre (tpa) will accomplish these objectives—with higher stocking on lower sites and where aggressive weed competition is expected.

A planting date should be selected to balance the risks of freeze damage and drought stress. The recommended planting window for elevations below 1,000 feet is mid-March to mid-April.

To partially offset the effects of heat and drought on newly planted seedlings, deep planting (ground level approximately two to three inches above the root collar) is recommended. The thin bark of alder is easily damaged by sun-scald and heat. Seedlings should be planted at least one foot away from downed logs and larger branches that can reflect heat and cause sun-scald. If scalping that could expose the tree to sun-scald-

ing is required to properly plant the seedling or remove slash, minimize the exposure of mineral soil; mineral soil at the base of the stem acts as a heat sink, and the bark readily damages.

## Stand Tending

**Thinning.** Our understanding of density management and thinning in



*A 12-year-old red alder plantation on red alder site index 100 feet near Silver Lake, Wash.—three years after pre-commercial thinning from 600 to 360 trees per acre.*

PHOTO COURTESY OF WEYERHAEUSER TIMBERLANDS RESEARCH

red alder is far from complete. However, there are findings relative to red alder plantation stand dynamics that can give acceptable guidance. Thinning can maintain diameter growth rates as long as the thinning takes place when crop trees still have a good live-crown ratio (60-70 percent live-crown length). Thinning early maintains good diameter growth, lessens epicormic branch for-

mation and decreases the potential for stem diseases. Sometimes it is necessary to thin red alder early to reduce the competitive effects of conifer and hardwood in-growth—western hemlock and cascara can be particularly problematic.

Thinning early means crop trees will reach commercial size sooner, but there will be a decrease in the rate of crown recession/self-pruning and an increase in branch diameters in the first 16-foot log. Thinning late, after crown recession exceeds the length of the first log, gives better log quality and more clear wood, but less growth response from thinning, smaller crop tree diameters and a longer rotation to achieve commercial size. Stand density needs to be regulated to keep the stand growing between Relative Density of 0.15 to 0.35. Red alder plantations will usually require two thinning treatments to achieve desired log dimensions at harvest. The second thinning could be a commercial thinning depending on market conditions.

Maintaining a uniform growing environment is critical to the production of quality sawlogs. Leave tree selection criterion priorities are spacing, stem quality/disease and diameter at breast height (dbh). Minimizing damage to crop trees (stem wounding, top-break) is critical—it is the primary pathway for entry of disease and resulting decay. Time the thinning operation for late-summer to late-winter when tree bark is less susceptible to abrasion from falling trees. Direct cut trees into the lower stem of crop trees to facilitate breaking of dead branches from the stem. Cut out forked stems that originate below breast height—cut with a downward sloping angle to promote shedding of water.

**Pruning.** Live-branch, multiple-lift pruning can be done to increase the yield of clear wood without slowing dbh growth appreciably. Clear wood formed at an early age will have the same value as clear wood laid down at a later age because of the consis-

tency in red alder wood properties with age. Pruning is done using hand saws and ladders (with a ladder length to match the height of the lift). Branches are cut flush with the branch collar without damage to the branch collar. Given the self-pruning exhibited by red alder there will be a fair amount of clear wood produced without the expense of pruning. A good estimate of the amount of clear boards or veneer produced without pruning is needed in order to evaluate pruning as a silvicultural investment.

**Nutrition.** Red alder nutrition is a knowledge gap. Little work has been done to identify nutrient deficiency levels for red alder and the work that has been done was with seedling pot culture studies. Work done on red alder fertilization has shown red alder to respond positively to phosphorus (P) fertilization in almost every experiment. An unpublished Weyerhaeuser study in red alder on multiple sites showed fertilization with 250 lb./acre P at planting and at age seven years increased soil and foliar nutrient concentrations of nitrogen (N) and P, and tree growth.

It is very important to remember

that red alder is much less forgiving than Douglas-fir to deviations from Best Management Practices (BMPs). It is essential that BMPs for site selection, plantation establishment and silviculture be followed in order to achieve successful plantations. Red alder tree growing can be very successful on the “right” sites. Plantation establishment success and subsequent tree growth can be highly variable on the “wrong” sites. Generally, the best sites biologically for growing red alder are also some of the best sites for growing Douglas-fir. It is also important to remember that having uniform stocking and rapid early growth so that the stand “captures the site” within the first three years is critical. If landowners practice what is known about red alder tree growing, they can produce valuable sawlogs in a relatively short rotation when compared to other high value hardwood tree species. ■

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