



The Woodland Workbook

Multiple Use



Christmas Trees in the Small Woodland

Christmas tree production has been very attractive in recent years. The Oregon State University Extension Service estimates that the value of the Christmas tree crop in Oregon has risen from \$8 million in 1977 to more than \$24 million in 1981. These figures represent a lot of activity, and many people have expressed an interest in taking part.

The attractiveness of Christmas tree growing to woodland owners lies in the short turnover of the crop as well as in its potential for profit. This circular presents some pros and cons of growing Christmas trees and outlines aspects of Christmas tree culture for the prospective grower.

Many people have the impression that, to grow Christmas trees, all one has to do is place seedlings in the ground and harvest them a few years later—and that this can be done on land not suited for growing timber. Twenty years ago, this was nearly the case. Growth was controlled by planting trees on poor sites.

However, grower sophistication and competition have increased; and Christmas tree production has been shifted to the best sites for rapid growth. Horticultural techniques have been adapted for use in controlling growth and improving quality. Producing and managing Christmas trees requires a different set of skills and information from those used in growing timber.

An important factor to consider is that the Christmas tree industry is cyclic; successful growers have to adapt to the ups and downs of the market. The Northwest, along with the rest of the country, has a huge inventory of seedlings in the ground. Industry sources forecast a glut of harvestable Christmas trees in the near future. The Northwest, in particular, is sensitive to national overproduction because this region depends heavily on exports to distant markets. The traditional market has been California, but in response to the last tree surplus, markets have opened up in Texas, the South, and the Northeast. However, it will be more difficult to compete in these areas as production overtakes demand throughout the nation. The anticipated downturn will hit small and new growers the hardest.

Site and species selection

Most production of Christmas trees in Oregon is in the foothills of the Coast Range and the Cascades, on the outer edges of the Willamette Valley. The soils in these areas are moderately fertile, have moderate to high water-holding capacity, and are well drained. Often the land has been used for other crops in the past.

Growers should avoid certain conditions:

- Strong south slopes and areas that have shallow soil dry out quickly in the summer. Under these conditions, trees are difficult to establish. Survivors will grow slowly and will have poor quality growth.
- Wet conditions reduce seedling survival and distort growth. Weeds adapted to poorly drained soils will grow well and provide strong competition for tree seedlings.
- Growers should also avoid areas that frequently have late spring frosts. The tender growth of conifers is cold-sensitive, and frost damage to the shoots will delay development of marketable trees.

Douglas-fir is the leading Christmas tree species grown in Oregon, accounting for about 75 percent of production. It can be grown under a variety of moderate conditions to produce high quality Christmas trees. Typically, growers can harvest Douglas-fir Christmas trees in 6 to 9 years.

Many growers are using seedlings from areas identified as producing superior Christmas trees. Medium-elevation strains from the Willamette basin are suitable, as are the

Vancouver Island (Duncan) and Shelton (Lake Cushman) sources. These strains tend to be vigorous, and they have upright branching habits and good needle color. A drawback of these coastal Douglas-fir strains is their sensitivity to stress after harvest, which causes rapid defoliation.

A factor often overlooked in seedling selection is date of bud-burst. Early bud-bursting strains of Douglas-fir are more vulnerable to damage from Douglas-fir needle midge, frost, and some fungal infections. Growers can partially overcome these problems by selecting from the same elevation or up to 500 feet above the plantation. In general, too, sources within 50 miles to the south or 150 miles to the north are acceptable.

A refinement in seed selection is to select individual trees that produce desirable seedlings. The Northwest Christmas Tree Association as well as some growers have advanced to this stage. The association has propagated a number of Douglas-fir trees in a seed orchard that will produce generally superior seedlings.

The association is also supporting work at Oregon State University to select superior Douglas-fir and propagate them from cuttings. The commercial development of clonal stock represents the ultimate in genetic quality of Christmas trees.

The true firs, especially noble fir, are regarded as top-quality Christmas trees. Unfortunately, the higher price that they bring often does not make up for their longer rotation period, 8 to 14 years. The true firs are difficult to grow, as they require cooler, moister summer conditions than do Douglas-fir or the pines. The best sites are usually at or above 1000-foot elevation on gentle, well-drained, north or east slopes. Noble fir can be grown at lower elevations, but the trees are subject to many problems.

Two superior seed sources have been identified for noble fir. These are the upper Siletz River drainage in the Coast Range of Oregon, and the upper Kalama River drainage in southwestern Washington. Seeds from the Cascades east of Molalla are also being used successfully.

Grand fir from northern Idaho and southeastern Washington have been generally regarded as high quality trees. Grand fir is the easiest to grow of the true firs, but it accounts for only a small percentage of production.

Scotch pine is widely used for Christmas trees in the United States, accounting for about 35 percent of national production. Seedlings from sources in southern France and Spain are preferred for planting in the Northwest. Fewer and fewer Scotch pine are being grown in Oregon, however, because of outbreaks of *Lophodermium* needle cast and the European pine shoot moth. The moth damages trees and is a quarantined insect in California.

For these reasons, Scotch pine is relatively unattractive to growers and buyers. It is regarded as a species to grow on poor sites. It is true that the species will tolerate more extremes, but the quality of growth will not be as good as that on better sites.

Ground preparation and planting

In order to enhance tree survival and growth, growers must stifle weed competition. In most cases, this means tillage to eliminate the majority of the weeds. Tillage is also important to loosen the planting bed to permit vigorous root growth. However, some growers have adopted no-till methods of field preparation. Untilled fields are difficult to machine-plant, but you can plant earlier and reduce erosion.

A number of herbicides are registered for use in Christmas tree plantations, and it is important to select an appropriate chemical for the particular problem. If you are dealing with site preparation, new or established plantations, or if you must control grasses, broad-leaved weeds, or brush, certain herbicides will work best.

Planting quality seedlings in the well-prepared field is the critical step in establishing a Christmas tree plantation. Most seedlings are grown by commercial nurseries and planted as 2-0 stock. Some growers are beginning to use 2-1 stock (that is, 2-year-old trees transplanted and grown in beds for another year).

These trees are bigger and better developed than 2-0; consequently, survival is better, and faster growth will shorten rotation. The decision to use 2-1 stock rests on its availability, adaptability to planting machines, and costs. You can easily recover the cost of 2-1 seedlings, however, through the shortened rotation.

Investing in high quality seedlings is important, and proper handling of those seedlings is necessary to ensure their survival. Because most seedlings are dug and shipped bare-root (container-grown seedlings account for only a small percentage of planting), they are very sensitive to drying. You should time the shipment of seedlings to coincide with harvest, so that you can plant them immediately.

If planting will be delayed, you must find proper storage facilities. Ideally, you should keep bundles of seedlings in refrigerated (35°F) storage. Even under these conditions, you must moisten stock frequently. If refrigerated space is unavailable, you can heel-in the seedlings in moist, well-drained beds.

Nearly all Christmas tree seedlings are planted in the spring, as soon as the field is dry enough to enter. That date will be earlier for hand planting than for machine planting. Large, clean fields are usually planted mechanically, but untilled or small areas are usually planted by hand. Caution is required to ensure proper placement of the roots in the soil. Turned up roots ("J-roots") or excessive compaction of the soil around the roots can hinder root growth and stunt or kill the seedling.

Even for the few hours the seedlings will be exposed in the field, you must take precautions to protect them. Ice chests, space blankets, or other insulating material are satisfactory. Do not use materials like canvas tarps; the seedlings will quickly overheat.

Tree spacing depends on the market you plan to develop. Spacing of 5½ x 5½ feet to 6 x 6 feet is the most common arrangement for the typical 6-foot tree. Closer spacing is appropriate for small trees and a quicker harvest. Some growers are experimenting with 3-foot spacing, harvesting every other tree at table-top size, then growing the remaining trees to standard size.

Woodland owners may harvest a crop of standard trees and leave enough trees to stock the land for timber. In laying out the fields, allow enough space for an adequate network of roads. Roads make culture and harvest easier, and they serve as firebreaks. Spacing averages about 400 feet.

Culture

After planting, the primary cultural tasks are to control weeds, replace dead and injured trees, and prune multiple leaders in the seedlings. During the first 2 years in the field, the seedlings should become well established, developing size and vigor to tolerate shearing.

Douglas-fir is usually ready to basal prune by the third growing season. Basal pruning removes the lower branches up to the first whorl to form a handle. This aids in cutting and handling the tree at harvest and supporting the tree in the home. Excessive removal of foliage to form the handle will shock the tree and slow growth unnecessarily. Do not basal prune any more than one-third of the foliage.

Basal pruning of noble fir has the additional function of growth control. The desired length of noble fir leaders is 12 to 16 inches. Trees with long leaders are lower quality, because of their light density. Various techniques to limit leader growth are used. Basal pruning of noble fir is usually performed when leaders growth reaches the ideal range of 12 to 16 inches. By removing the lower branches to form the handle, you can reduce growth the following year. You can control leader extension in future years by pruning or scarring.

When you control leader length, you must also side shear to keep the tree in balance. Shearing begins the third or fourth summer after planting and is continued each year with harvest. It is the major cultural activity of the Christmas tree grower, and is usually done in July and August. Knives are the most common shearing tool, but mechanical shearing techniques are being developed. By modifying tree growth and making a denser, more uniform plant, you can produce more saleable trees than would otherwise be possible.

Pest control

Pest damage is usually light but frequent in Christmas tree plantations. Simple cultural precautions often prevent damage. For example, rank weeds may encourage deer, provide habitat for mice and rabbits, or be alternate hosts for disease organisms. Bracken fern is the alternate host for a rust fungus that attacks true firs. The disease must alternately infect firs and ferns to complete its life cycle—thus the need for adequate weed control. In addition, remove at once trees that are attacked by diseases if effective chemical controls are unavailable.

Several pests are particularly common and are worth mentioning here. The Douglas-fir needle midge hatches at average bud-burst in the spring to lay eggs on tender shoots. Subsequent larval development injures the needles. Adequate chemical control is available, but you can thwart the insects' cycle by planting late bud-bursting strains of Douglas-fir. This strategy bypasses the time when the midges are most active. In addition, it helps to avoid frost damage.

Swiss needle cast is a fungal disease of Douglas-fir that is now locally severe in the Northwest. Small black spots develop on the underside of the needles in the spring. As the result of tissue damage, the needles then fall off the following summer (1 year later). Heavy infections of this disease make the trees unsaleable. Chemical control has been developed and approved for Swiss needle cast.

Another fungal disease of Douglas-fir is *Rhabdocline*. Reddish-brown spots develop in the spring on the previous year's needles, which fall off prematurely. There is no effective chemical control available.

Deer damage to succulent leaders of Douglas-fir is often a problem. Some repellents are available, but repeated application is necessary.

In summary, some losses to pests can be expected to occur in Christmas tree plantations. To date, potentially devastating pests have been controlled, often through simple cultural or genetic practices, such as planting seedlings from the correct seed source.

Harvesting and marketing

Start locating buyers for your trees before they are ready to harvest. Buyers may have suggestions on how to culture the trees that will make the trees more marketable, and it is helpful to establish a relationship with the individuals you are dealing with.

The greater the effort you put into marketing trees, the greater the success you can achieve. By learning what the market trends are, you can anticipate future customer preferences. For instance, a trend toward shorter, more lightly sheared trees is in evidence. Such trees fit in smaller homes and are lighter to ship.

Growers usually sell trees to wholesalers. Arrange for enough time for buyer and seller to inspect the trees and agree to terms so that neither party is rushed into a deal. The terms of the sale should determine how many or which trees will be cut in the block; the price; and who will cut, yard, load, coordinate truck schedules, and pay for shipping. Once this is decided, harvest will proceed according to the agreed shipping dates.

Traditionally, Christmas tree harvest has been labor-intensive. Trees are felled by chain saws, carried to the nearest road, loaded on a wagon, and hauled to the concentration yard where they are sorted, graded, baled, tagged, and loaded on a truck for shipment.

This scenario is changing as growers develop new machines to increase efficiency. Implements are being introduced to cut trees easier and faster. Several growers have built hydraulic devices to compact many trees into a large bale that can be handled by helicopters and forklifts for easier yarding and truck loading. Eventually, trees may be harvested almost without being touched by human hands.

Christmas tree growing can be a productive addition to a woodland operation. However, increasing competition requires that growers dedicate themselves to intensive care of the plantation and pay close attention to marketing in order to profit from the experience.

See your county Extension forestry agent for publications covering other aspects of Christmas tree production.



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Extension's forestry program improves Oregonians' knowledge of forest resources and their options for expanding benefits from these resources. This educational program assists forest owners, managers, processors, and users in understanding small woodland production and management and use of all forest lands. Priority subjects are reforestation, growth, management, harvesting, processing and use of wood, protection of soil and water, and other multiple uses and values.

This publication was prepared by W. M. Proebsting, Extension Christmas tree specialist. It is one of a series of publications being developed as an Extension Woodland Workbook. Your county Extension forestry agent has additional information.

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