



An Introduction to Growing Christmas Trees in Virginia

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Each year, landowners in Virginia consider Christmas tree farming as an alternative enterprise for their unused open land. There is not a lot of detailed information available about the Christmas tree industry in Virginia, but it is estimated that there are between 400 and 500 growers in the state. They can range in size from small choose-and-cut operations on a few acres of land to large wholesale operations covering hundreds of acres, with the average farm being around 40 acres in production. Regardless of size, growing Christmas trees successfully takes expertise and an investment of time and capital.

This publication provides a broad overview of Christmas tree production in Virginia. Potential growers should certainly seek more detailed information from their local Virginia Cooperative Extension agents and specialists because proper planning can be the key to a successful plantation.

Advantages of Growing Christmas Trees

Most agricultural and horticultural crops require larger financial investments and more intensive management than timber production. Christmas tree production is a compromise between short-term, intensively managed agricultural crops and long-term timber production. As such, it shares many of the advantages associated with each type of production.

- Christmas tree rotations are much shorter than timber rotations. It takes six to 12 years to grow a marketable Christmas tree, less for a smaller tabletop tree. Timber production requires 20 to 30 years (or more, depending on site and tree species). Besides providing income sooner, Christmas trees do not tie up land and capital resources as long as timber production does.
- Christmas trees can be grown economically on small acreages. Timber production and many agricultural crops require large acreages for economical management. Although there are marketing disadvantages associated with very small plantations, Christmas trees can be and are sometimes grown on farms of 1 acre or smaller.
- Christmas trees require less groundcover disturbance than that needed with many agricultural crops. Ground vegetation is controlled, not removed, and little bare ground is exposed. This vegetation helps prevent the erosion that commonly occurs with agricultural crops.
- Capital investment for machinery can be low for Christmas tree production. On small acreages, all work can be performed with hand-operated machines and tools. Reduced machinery requirements allow production on many sites too rough or steep for other crops.
- Many growers begin production for reasons other than economic returns. A Christmas tree plantation offers the opportunity to get fresh air and exercise while being productive.

Misconceptions About Growing Christmas Trees

1. Growing Christmas trees is easy. As you continue to read through this publication, you will understand that growing a quality tree will take investments of time, work, and money. The tree standing in your house at Christmas is the result of years of commitment from a dedicated farmer.
2. It will be a good use of my marginal land. It is true that trees, especially pines, can adapt and

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survive in a variety of climate and soil conditions. However, as a Christmas tree grower, you are not just trying to have a tree survive; you need it to thrive. Planting trees in areas that are too wet or dry or otherwise unsuitable will result in weak, thin trees susceptible to insects and diseases. It is important to remember that as a grower, your product not only represents your farm, but all real Christmas trees. It is critical for the future of the real Christmas tree industry to produce the highest-quality tree possible.

3. It is a quick return on investment with a very high rate of return. As covered in the next sections, growing Christmas trees is an investment in capital and time, and it carries the same inherent risks as other types of farming. Unforeseen factors such as weather, disease, insects, and market fluctuations can all affect the profitability of the grower.

Christmas Trees as an Investment

The decision of whether or not to grow Christmas trees can be partially decided by economic considerations. Much time and some money must be invested in order to produce a crop of trees, and it is good to have some upfront idea as to what these time and money requirements are.

Experienced growers estimate that once the trees are above 3 feet tall, each acre requires about 40 man-hours per year of care. Furthermore, many cultural treatments must be done at certain times of the year. Shearing is often confined to a five-week period during early summer, and mowing is required as needed throughout the growing season. Frequently, growers will plant too many trees and find they must hire outside help in order to keep up with all the cultural practices that need to be done in later years.

There are many costs of producing Christmas trees that must be borne during the early years of the plantation. It is not until some trees are large enough for harvest and sale that a positive cash flow begins.

Production costs can include the following:

- Equipment (mowers, sprayers, shearing equipment, etc.).

- Labor (planting, pest control, shearing, harvesting, etc.).
- Seedlings.
- Chemicals (herbicides, insecticides, fertilizers, etc.).
- Miscellaneous items (signs, flagging, road maintenance, gates, etc.).

Total costs will often depend on the size of the operation. For example, a small grower with less than 10 acres may invest in only a small riding tractor or a walk-behind, self-propelled mower, a backpack sprayer, and shearing equipment. Larger growers will need to rely on tractor-mounted equipment.

Finally, there are no guarantees of high prices at the end of the rotation because there is always the risk of valuable trees succumbing to drought, wildfire, insects, diseases, and pests.

What Type of Farm Are You Going to Have?

Christmas tree growers in Virginia have three options when growing and marketing their trees: wholesale, choose and cut, and retail lots. We will look at them separately, knowing that some farms may choose multiple options.

Wholesale

Selling Christmas trees wholesale refers to selling large numbers of trees at one time to one or a few buyers. These sales can be a hundred trees to a local civic group or thousands to a big box store. These trees are often pre-tagged in the field by height and then broken into quality grades with premium or No. 1 being the best. In Virginia, most wholesale growers are located in the western part of the state, and the market is dominated by Fraser fir, with Canaan fir and eastern white pine a very distant second. Current wholesale prices for Fraser fir in 2013 were \$26 for No. 1 and \$20 for a lower-grade No. 2 tree.

In order to be a successful wholesale species, the tree must be able to be cut, stored, and shipped while retaining its needles, color, and smell. Wholesale growers will earn less income on a per tree basis. They must be aware of the volatility of the market and be able to compete with other well-established growers locally and nationally.

Choose and Cut

Choose-and-cut growers sell single trees to individual customers visiting their farms. These farms have trees of all different sizes and up to 10 different species. A choose-and-cut farm can be established in all regions of Virginia with the species selection varying by location.

There are many advantages to being a choose-and-cut farm. The trees, whether being sold by the foot or whole, command higher prices than does a similar tree sold wholesale. Furthermore, choose-and-cut farms can gain significant income by selling wreaths, roping, ornaments, etc., at an on-site Christmas shop. On these farms, selling the Christmas experience to the customers can be as important as the tree itself.

Of course, there can be a few disadvantages for choose-and-cut farmers. There is an increased cost associated with managing fields with different species and age classes of trees as compared to wholesalers who tend to manage their fields in large, single-species, even-aged blocks. Plus, the sales season for the entire year lasts just four to five weeks, with 80 percent of the income coming in the three weekends between Thanksgiving and Christmas. Bad weather during this critical time can limit sales, and it also means that every unsold, sellable tree will have to be managed for another year.

Retail Lot

Christmas tree farmers may choose to market their trees on a separate retail lot. In this case, growers want to be in control of their own sales, but their farm may be limited by location, access, or competition. In a retail lot, a grower can demand the highest price per tree but will also have the highest overhead and — unlike in wholesale or choose and cut — all unsold trees will be lost.

Christmas Tree Production

Site Selection

Once the grower has determined the type of farm they are going to be, the next consideration is site selection. The most suitable planting areas, spacing, appropriate tree species, and logistical constraints should be determined. The importance of proper planning cannot be stressed enough. This is the time to read all of the

relevant Virginia Cooperative Extension publications, talk to your local Extension agent, join your local growers association, and attend as many Christmas tree meetings, workshops, and farm tours as possible. Early mistakes in species selection, road layout, spacing, etc., can take years to overcome.

Plantation Planting

Proper planning before planting ensures the efficiency of subsequent operations. Planning includes determining the total number of available acres to be planted, plantation layout, and individual tree spacing. The most serious mistake is excessive planting without consideration of the subsequent labor requirements and marketing. It is recommended that growers plant only a portion of their land at one time, instead of all at once. For instance, if it takes eight years to grow trees, one-eighth of the total planned area should be planted each year.

Planting trees on a rotation basis also distributes the workload over the years and enhances marketing. When planting in rotation, markets can be built up gradually. Most new growers should plant only small acreages (1/2 to 1 acre) each year until a full rotation is completed. With this scheme, the grower learns the techniques and can better decide whether or not to invest more heavily in larger plantings. Far too many realize that Christmas tree production isn't for them only after they've planted many acres.

Plantation design and layout includes incorporating blocks of trees that will allow efficient operations. Often, complete fields are planted without thought of access. In this event, whole rows of trees must be removed to provide access, or excess labor must be used to resolve the problem. Farm layout is especially critical for choose-and-cut operations. In addition to the trees, you have to consider the location of customer parking, restrooms, a Christmas shop, a measuring/shaking/wrapping area, etc.

Another common mistake is planting individual trees too close together (see table 1). A typical wholesale farm can plant trees at a tighter spacing than a choose-and-cut operation. Fraser fir has a tighter taper than other species, and the trees are typically grown and harvested in single age blocks, which leads to spacing as low as 5 by 5 feet. However, unsold trees planted at too close of a spacing may not be able to be grown into the next season, and the farmer may have to

go in and thin or completely remove the remaining overgrown trees.

In comparison, it is recommended that the spacing on a choose-and-cut farm be much wider at 7 by 7 feet or 7 by 8 feet. This wider spacing allows for the typical mix of tree species and ages in the field and accommodates better access for the customers. Choose-and-cut customers need to be able to easily walk through the field, look at a tree from all sides, cut it down, and carry it to the nearest pick-up location.

Site Preparation

Once the plans for the location and number of trees are laid out, the site can be prepared for planting. Inadequate site preparation creates future problems that often require extensive hand labor to correct or cause plantation failure.

Depending on conditions, site preparation may consist of any or all of these operations:

- Eradicating existing trees and shrubs.
- Removing physical obstacles (stumps, logs, etc.) to permit cultural operations.
- Controlling grasses and other herbaceous vegetation.

Recently cutover timberland requires the most extensive site preparation efforts. It may often be more economical to pay more for cleared land than to try growing trees on cutover lands because of reduced site preparation efforts and subsequent maintenance efforts.

Site preparation should be completed the fall before planting; herbicide treatments should be done by late summer to early fall. If shrubs or trees exist on the area, site preparation may need to be initiated several years before planting. This would be the time to perform a soil test of your planting area. Your local agricultural extension agent or county office can help you with soil boxes and instructions for the test. These soil tests are valuable for determining which amendments to add to the soil before planting. It is much easier and more economical to add fertilizer or lime prior to tree planting.

Species Selection and Seedling Size

Many species of Christmas trees can be grown in Virginia. Along with species that have traditionally dominated the market — Fraser fir, eastern white pine, Scotch pine, Norway spruce, Colorado blue spruce, Leyland cypress, and Douglas-fir — many new species are being introduced. These exotic species include Concolor fir, Canaan fir, Turkish fir, Carolina

Table 1. Total trees per acre with varying spacing between and within rows.

Feet between rows	Feet within rows						
	4.5	5.0	5.5	6.0	6.5	7.0	7.5
4.5	2,151	1,936	1,760	1,613	1,489	1,383	1,291
5.0	1,936	1,742	1,584	1,452	1,340	1,244	1,162
5.5	1,760	1,584	1,440	1,320	1,218	1,131	1,056
6.0	1,613	1,452	1,320	1,210	1,116	1,037	968
6.5	1,489	1,340	1,218	1,116	1,031	957	894
7.0	1,382	1,244	1,131	1,037	957	888	830
7.5	1,291	1,162	1,056	968	894	830	774

sapphire cypress, and Serbian spruce, to name a few. Many of these species offer the choose-and-cut grower excellent alternatives for their customers if Fraser fir cannot be grown on their farm. They allow a wholesaler to diversify and to plant trees that may be less susceptible to *Phytophthora* root rot.

Once the grower decides on the species mix to plant, they have to decide where they are going to purchase their trees from and the size of the trees to buy. Seedlings can be purchased from the Virginia Department of Forestry or from many private nurseries that specialize in varieties bred specifically for the Christmas tree market. Seedlings can range in size from 2-0, which is a bare-root seedling grown for two years in a nursery bed, to 2-3, which is a 5-year-old seedling transplanted to a new nursery bed for wider spacing after two years. A much less common seedling is a P+1, which is a 1-year-old seedling that is grown in a plantable container for a year before being transplanted to a nursery for an additional year.

There are many factors when considering seedling size.

- How quickly you want to get a return on your investment? Bigger seedlings = faster returns.
- What tools are you going to use to plant?
- What is your soil type?
- What is the cost of seedlings and shipping?
- What is your level of weed control?
- Are you planting fast- or slow-growing species?

Planting

Seedlings should be ordered several months before they are to be planted. Late winter through early spring (mid-April) is usually the recommended time for planting. Allowing seedlings to dry, freeze, or overheat is a common cause of seedling mortality the first year. Most of the trees in Virginia are hand planted with some type of “dibble” or planting bar. These specific tools allow the planter to open a hole deep and wide enough to plant the seedling at or below the original nursery depth without pruning any roots. The dibble’s design allows the planter to wedge soil around the planted seedling assuring essential root to soil contact. A simple tug on the seedling will confirm

that it is planted properly. A grower will quickly realize why it is important to match the seedling size to their individual soil conditions. A 2-3 seedling may be nearly impossible to plant properly in rocky or clay soils (fig. 1).



Figure 1. A newly planted Christmas tree farm. Notice the weed control completed before planting.

Weed Control

Weed control is especially important during the first few years following planting. Competition from grasses and other vegetation can kill trees or limit their growth by blocking sunlight and competing for soil moisture. Tree quality can be reduced by vegetation that restricts lower branch growth. Weed control requires spraying herbicides in early fall and/or early spring in spots around each tree or in bands along the planting row. Additionally, the area between the treerows is usually mowed about three times each year.

Growers should use caution and follow label instructions when using herbicides. Determining proper herbicides, spray volumes, and timing for controlling specific weeds can be complicated, but Virginia Cooperative Extension has extensive information — including Pest Management Guide: Horticultural and Forest Products — to assist in determining proper herbicide application. Growers can contact their local Extension office (www.ext.vt.edu/offices/index.html) for more information.

Shearing

Beginning about the third year after planting, trees must be sheared each year. Shearing consists of cutting

branches to give the tree a desirable upside-down cone shape. Shearing can be accomplished with a manual shearing knife or a motorized, Beneke-style rotating machine (fig. 2). Regardless of the implement used, shearing trees can be extremely dangerous and proper safety equipment and methods must be used at all times. Improper shearing is the primary cause of nonmerchantable trees and abandoned plantations. Even with inadequate vegetation control, trees will often survive and be marginally marketable, but improper shearing usually eliminates marketability or requires extensive corrective pruning. Consequently, it is critical to learn proper shearing techniques.



Figure 2. Shearing in summer using a motorized shearer.

Once the trees are 3 feet tall, proper shearing requires considerable manpower. Although small trees are sheared quickly, it can take 10 to 30 hours or more to shear 1,000 larger trees. In Virginia the shearing window for pines typically falls around the Fourth of July weekend or when the new needles are two-thirds the length of the existing needles. Spruces and firs can be sheared any time after budset, but they are typically sheared before the stem becomes woody.

When shearing starts, landowners often wish they had planted fewer trees. Assuming 1,200 trees per acre, and one-eighth of the plantation is in each age class is from 1 to 8 years old, the average person can shear a total of about 3 acres with a knife during three 8-hour-day weekends. New growers often plant this acreage or more annually and must hire outside help (if it's available) to shear. The costs for shearing 500 trees at age 4 and age 8 were \$150 and \$250, respectively (2013 data).

Fertilization

Generally, pines do not require high levels of nutrients, and on most sites, tree response to fertilizer does not justify the expense. Firs and spruces, however, are more nutrient-demanding and are fertilized annually in the winter or early spring. Nitrogen is commonly the primary nutrient applied, but complete fertilizers — containing nitrogen, phosphorus, and potassium — are often used. Growers should contact their local Extension office for instructions and costs associated with soil sampling and fertilizer recommendations.

Pest Control

Insect and disease pests can be major problems in some plantations. Virginia Cooperative Extension's annual Pest Management Guide: Horticultural and Forest Products provides growers with detailed scouting schedules for the major tree species. When present, they must be controlled quickly to prevent damage that may often be substantial. It is crucial that pesticides be applied at proper doses and times, as stated on the product label. One week too late or too early could waste pesticide and labor, but the ensuing damage caused by ineffective control can result in heavy tree damage. As with scouting, the Pest Management Guide provides up-to-date information on specific pesticides, and local Extension agents can provide additional requirements.

Wildlife pests cause problems in some plantations by feeding on new growth or, in the case of deer, rubbing their antlers on trees. In areas with high deer populations, the deer may feed on certain tree species, and successful control techniques are limited. Voles cause damage in plantations by girdling the bases of trees. A control technique includes proper vegetation control, which can significantly reduce their damage.

Coloring

In recent years, many growers have begun to spray their mature trees with a colorant in the fall prior to harvest. This practice imparts a deep, rich green color to the trees and masks the natural fading or yellowing common with white pine and some varieties of Scotch pine.

Christmas Tree Marketing

As trees on the farm begin to reach saleable size, a farmer has to think about how to market them. In the past, typical ways to market trees included a sign at the entrance of the farm, an ad in the local newspaper, or a spot on a local TV or radio show. Although all of these methods are still valid and extremely useful, more Christmas tree customers are using social media to decide where to shop. Every farm today should have an up-to-date website with pictures/videos, directions, inventories, etc., and Facebook and Twitter accounts. Farms should also be listed on search engines that can be found by mobile devices such as GPS and smartphones. Website visits can be enhanced if the site is linked to tree-locator devices found on the Virginia Department of Agriculture and Consumer Services (www.vdacs.virginia.gov) and growers association websites.

Finally, the most important aspect of marketing is making sure you are creating an environment your customers want to return to. For wholesalers, this means providing the highest-quality tree possible, but for choose-and-cut and retail operations, this requires more than just a quality tree. It also requires good parking, a friendly staff, clean restrooms, and a holiday atmosphere.

Additional Resources

Because of unknown markets and resource requirements for growing Christmas trees, landowners may decide that production of other crops is more appropriate for their property. Virginia Cooperative Extension offers educational programs and materials on many crops, such as berries, mushrooms, and timber. Contact your local Extension office for more information. Landowners should also recognize that their local Virginia Department of Forestry office can provide many services for producing timber on private woodlands.

Additional information is also available from the following individuals and organizations.

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Virginia Christmas Tree Growers Association is an association of professional Christmas tree growers interested in the expansion of our farming industry by growing and marketing quality trees. Through our support of research and education, we strive to improve the numbers, quality and types of trees available to the fresh tree market.

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