



# Introduction to Growing Christmas Trees

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Along with the renewed interest in alternative agricultural enterprises, the interest in growing Christmas trees has also blossomed. Christmas trees can be grown successfully in Oklahoma; however, knowledge of production procedures and marketing potentials are essential. As an alternative enterprise, it entails a high degree of risk, and producers should not depend on Christmas trees to save an otherwise unprofitable farming operation.

Given adequate planning and preparation, an economically successful plantation may be established. The potential grower must realize the marketplace will be increasingly competitive. Nationally, some experts fear there is overproduction of Christmas trees. Many states are producing more trees than they can expect to sell in-state. Artificial trees have also captured a significant portion of the market. In 1989, approximately 34.4 million real Christmas trees were sold in the United States.

Historically, the majority of Christmas trees sold in Oklahoma have been imported, mainly from the Lake States and the Pacific Northwest. In the early 1980s the Oklahoma Christmas Tree Association was organized with about 10 members. In 1990, there were over 130 members of the association with about 35 growers selling trees. In 1990, approximately 13,000 Oklahoma grown Christmas trees were sold, representing less than five percent of the estimated Oklahoma market.

Oklahoma grown Christmas trees can be competitive since the trees are fresher and do not incur the transportation costs that exist for imported trees. Many buyers are becoming aware Oklahoma grown trees are available and they appear to prefer those over imported trees. As more growers in Oklahoma begin to sell their trees in the marketplace, local competition is expected to increase. The key to remaining competitive is a commitment to growing quality trees and developing an adequate market plan. It takes time, effort, and investment to grow a quality product. Potential growers should be well aware of the production process prior to making the decision to grow Christmas trees.

## The Production Process

Usually the production process is presented in sequence. In the case of Christmas trees the production process extends from site selection to marketing, although one grower commented that marketing should come first and last! As will be indicated in a later section, it is important to consider marketing plans before the first tree is ever in the ground.

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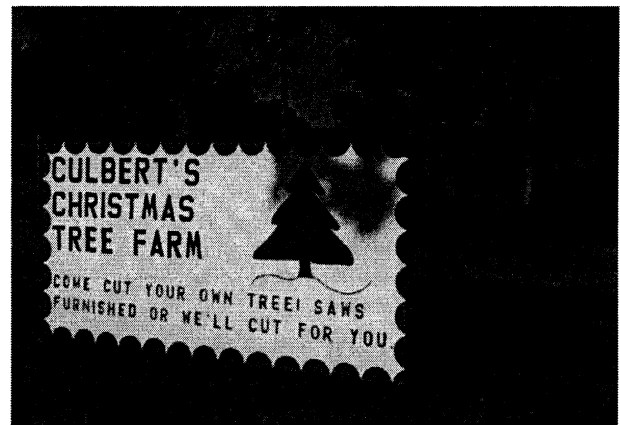


Figure 1. Choose and cut Christmas tree farms are becoming more common in Oklahoma and demand for Oklahoma-grown trees is increasing.

## Site Selection

The selection of a site is important to both production and marketing. Although Christmas trees can be grown on a variety of sites, the better the site the more efficient the operation and the faster the production of marketable trees. Location in relation to the market is also a critical consideration. Many growers, after investing five years to bring their trees to saleable size, are dismayed to find a new operation starting up between them and the market. This can be a serious setback, especially to a choose-and-cut operation.

Level to rolling land is best suited for Christmas tree production since it will most easily accommodate equipment for cultural operations such as site preparation, planting, and weed control. The site should be as protected from the wind as possible since wind can deform, break, or dry out trees. On exposed Plains' sites a windbreak can be planted around a plantation to provide protection from excessive wind. The ideal soil is a deep, slightly acidic, loamy soil with good internal drainage. Avoid sites which have coarse sands, heavy clays, or restrictive clay pans and avoid areas which are prone to flooding. Sites with a pH greater than 8.0 will make it difficult to grow a quality tree. Soil samples should be taken of any area under consideration to evaluate the site for acidity and nutritional deficiencies.



**Figure 2. Selecting an appropriate site is a critical decision. Here, Virginia pine have died due to saturated soils.**

### Species Selection

The species most often used for Christmas tree plantings in Oklahoma are Virginia pine, Scotch pine, and Austrian pine. Several other species such as Colorado Blue Spruce and White pine have been grown successfully in northeast Oklahoma, while Eldarica or Afghan pine has been grown with some success in western Oklahoma. Eastern red cedar grows naturally in Oklahoma and many people harvest field grown trees for Christmas.

Virginia pine is the fastest grower, producing a marketable tree within five years. Scotch and Austrian pines will normally take six to nine years to produce a marketable tree. Since Virginia pine is the faster grower, it will require more shearing during the summer than Scotch or Austrian pines which need only one shearing.

Obtaining quality seedlings will help to create a successful Christmas tree plantation. Improved genetic stock should be utilized. The Oklahoma State Department of Agriculture Forestry Division produces improved seedlings at the Forest Regeneration Center in Washington, Oklahoma. The seedlings are at low cost to landowners and can be used for Christmas tree production. Bareroot seedlings of Virginia, Scotch, and Austrian pines and containerized stock of Scotch and Austrian are available. Seedlings can also be purchased from commercial nurseries. Additional information concerning tree seedlings can be found in Extension Facts NREM-5093, "Tree Planting Objectives and the Seedling Selection Process," NREM-5034, "Seedling Availability, Planting and Initial Care," and NREM-5025, "Early Protection and Care for Planted Seedling."

### Site Preparation

Proper site preparation is important to the early success of the plantation. Site preparation increases planting survival by reducing competition with weeds and grasses and allowing for easier planting and cultural practices. Site preparation can range from mowing and burning to chemical and mechanical treatments. A totally weed free environment is not necessary but most of the competition, at least within the rows of trees must be controlled. Some attempts at planting in an unprepared old field have been successful but growth rates are reduced by competition, therefore, increasing the time till



**Figures 3 and 4. Scotch pine (above) and Virginia pine. The two most common species grown for Christmas trees in Oklahoma.**

the landowner begins to receive a return on investment. More information concerning site preparation can be obtained from Extension Facts NREM-5026, "Weed Control in Christmas Tree Plantations."

### The Planting Operation

Prior to planting, the field should be prepared for correct spacing of trees. To simplify subsequent cultivation, seedlings should be planted in straight rows. Spacing can be closer than a regular forest planting. A spacing of six by six feet is usually the closest spacing considered if an average tree six feet in height is to be grown. This spacing will require 1,200 trees per acre. The most important consideration in spacing; however, is that available machinery be able to fit comfortably between rows.

It is estimated only 50 percent of the trees planted as Christmas trees ever make it to market. This happens for a variety of reasons. Two of the main causes of mortality are improper handling and storage of seedlings and improper planting techniques. When purchasing seedlings, one should

check to see that they have been packaged correctly and have adequate root systems. If not planting immediately, make arrangements for cold storage of the seedlings. When seedlings will not be planted for more than a couple of weeks they should be "heeled in" (see Facts NREM-5024).

Planting bareroot seedlings is accomplished in the dormant season, usually December to March in Oklahoma. Fall planting is common when containerized stock is used. Whatever type of seedling is used, it is standard recommendation in Oklahoma, to have drip irrigation available for seedlings at least during the first two years of the plantation. More complete information can be found in OSU Extension Facts NREM-5024 titled "Tree Seedling Availability, Planting and Initial Care" and 1511 titled "Trickle Irrigation for Lawns, Gardens and Small Orchards."

## Controlling Weeds, Insects and Diseases

One thing new growers realize is they cannot just plant a tree in the ground and expect to produce a quality tree in five to seven years. Controlling competing vegetation and monitoring and control of insect and disease populations are critical components which must be tended to during the growing season.

Weed control begins with site preparation. The more weed control accomplished during site preparation, the easier weed control will be following planting. A variety of preemergence and post-emergence herbicides are available for Christmas tree plantations. Growers need to learn proper calibration and care in spraying to avoid damaging or killing trees by improper herbicide application. Each grower should receive pesticide certification provided by the State of Oklahoma. Other practices used in weed control include mowing, cultivation, and mulching. Animals have been used but rarely in commercial operations. Specific information regarding weed control can be found in Extension Facts NREM-5026, "Weed Control in Christmas Tree Plantations."

Insect and disease monitoring is critical to maintaining quality trees. Growers should be in their plantations at least several times a week to maintain adequate monitoring. Weekend growers have developed successful operations, however, special efforts are needed to examine the plantation during the growing season. The tip moth is one of the foremost pests in a Christmas tree plantation, especially of Virginia pine. Tip moths attack the terminal buds resulting in, lost growth and poor tree form. Additional information can be found in OSU Extension Facts EPP-7645, "Nantucket Pine Tip Moth," and EPP-7618, Common Diseases of Conifers in Oklahoma.

## Fertilization

Many growers, because of nutritional deficiencies in the soil must add nutrients by fertilizing. The benefits of a vigorously growing tree include improved growth, greater resistance to insect and disease infection, and reduced time to which returns are realized. Disadvantages include additional shearing in Virginia pine and potentially increased weed control problems. Research has not shown that automatic fertilization will produce a benefit. Unless a clear nutrient deficiency is observed in soil or foliar samples, fertilization must be decided on a site specific basis. Growers are encouraged to install test plots and monitor growth differences before investing in fertilization across the plantation. Additional information can be

obtained in OSU Extension Facts NREM-5027, "Fertilization of Christmas Trees in Oklahoma."

## Pruning and Shearing

Trees do not usually grow into the conical shape of a Christmas tree without some help. Shearing or "shaping" is one of the most time consuming parts of the production process. Shearing helps to create a single main stem, balanced symmetrical form, full and compact foliage and proper taper, all of which are considered in the USDA grading system. Although many manuals suggest shearing does not need to begin until the third growing season, many growers feel early pruning and shaping can help make later shearing easier. Problems such as abnormally long branches, branches too low to the ground, double tops, and insect damage may be corrected by early pruning.

Once trees reach chest height and above, shearing can take up to 20 hours or more per acre. Many growers underestimate the requirements of this phase of the Christmas tree production process. Missing a shearing can be critical to maintaining the quality of the trees and cause the grower a year or more in corrective shearing. Missing more than one shearing may prevent the trees from ever reaching marketable quality.

There are a number of tools which can be used in shearing and pruning trees. A 14-18 inch blade knife especially designed for this does a good job. Knives with longer blades and handles may prove better for growers with taller trees. Small, hand-pruning clippers are recommended for cutting the terminal and top bunches. Other growers use two handed clippers for shearing, especially when the trees are waist height and below. The knife is faster, but the hedge clipper is safer to use. When using the knife a leg guard should be worn, and the unoccupied free hand should be held behind the worker's back. Rechargeable battery powered shears or other mechanical hedge trimmers are also commonly employed, especially in larger operations.

A late "touch-up" shearing may be needed for trees which will be harvested that year. A green colorant is used on some



Figure 5. Cultural practices for Christmas trees are labor intensive. These Virginia pines are being prepared for harvest with a green colorant, which will help avoid yellowing during the dormant season.

species such as Virginia pine, which normally tend to yellow during the winter months.

Several videotapes have been produced to help the grower learn correct shearing practices. Practices will vary for each species. The time to shear each species is different and may vary each growing season. This is another reason why constant monitoring of the plantation is necessary.

## Harvesting and Marketing

The age at which trees are harvested will depend upon the species, rate of growth, climatic conditions, cultural practices employed, and the sizes the market demands. Many growers fail to develop a rotation plan and find they do not have an adequate supply of trees to service their potential market. Some growers clear each field as it is harvested and start the process anew, while others with fields partially harvested each year choose to interplant with younger trees next to the old stumps.

Christmas trees are similar to any other agricultural crop, they should be marketed before planting. The grower should know how to market the trees and where the market will be. The three basic ways Christmas trees are sold, include choose-and-cut, retail, and wholesale. Each of these methods has certain advantages and disadvantages. The grower must decide which will best fit operation objectives.

The choose-and-cut method is the most popular marketing technique being used by growers in Oklahoma. This method requires planting near a populated area. The buyer travels to the farm to select a tree. It is cut down and transported home fresh. For some families it is a tradition to select and cut down their own tree each year. In this way, the consumer assumes the cost of harvesting and transporting; while the producer must provide harvesting and bagging equipment, manpower, and parking. In many cases, the producer will also have costs of additional liability insurance and advertising.

The retail sale method requires the producer to cut the trees, transport them to town, rent retail space, and tend the lot to sell trees. The producer assumes the harvesting and transportation costs as well as bagging equipment and local advertising. Liability on the retail space will depend on the wording of the contract and is negotiable. The risk in this method increases since all of the trees cut may not be sold.



**Figure 6.** The choose and cut method of marketing is most popular with growers in Oklahoma.

Under the choose and cut method, those trees not sold can be left to grow another season.

When choosing to wholesale trees, the grower has a contract to provide a certain number of trees of a certain grade at a specified price at a designated time. Whether the buyer or seller harvests the trees can be negotiated. Some sales are on the stump while others may be roadside. The grower is guaranteed to sell a certain number of trees, but usually at a lower price than in the retail or choose and cut methods. The wholesaler can sell the trees at one time, in which case the holiday season is free to enjoy. More commonly though, the buyers are requesting trees on an "as need" basis which would require the grower to be available throughout the season.

Although prices vary depending on the location, transportation costs, the size, and quality of the trees, a grower may expect to receive \$2 to \$3 per foot of tree by the wholesale method, and \$3 to \$6 per foot of tree by the retail or choose and cut method. Taller and higher quality trees can sell for greater than \$6 per foot. Prices can vary greatly in local areas of high competition.

## Costs and Returns

Costs can vary greatly depending on scale of the operation, species grown, equipment used, efficiency and costs of labor, and various cultural practices implemented. Potential growers should carefully consider possible financial returns and risks in Christmas tree production. An example of a Christmas tree operation taken through one rotation is presented in Table 1. Data are presented on a per acre basis; however, the assumptions were made based on a 20 acre operation. The costs on a per acre basis will be different if fewer or more acres are in production. For instance, fixed costs such as a tractor will be greater on a per acre basis if an operation is only five acres instead of 20 acres.

The analysis assumed 1,210 trees were planted per acre and 1,050 were harvested. A harvest of 350 trees per year occurred in the fifth, sixth, and seventh year after planting. The trees were assumed to be five, six, and seven feet tall in years five, six, and seven respectively. Some growers have begun to sell trees in the fourth year after planting.

A detailed description of assumptions for the cash flow analysis is provided below. All costs and revenues are accumulated during the calendar year in which they were realized. The reader is reminded the cash-flow table itself does not represent an adequate financial analysis for making investment decisions. Present net values for individual operations should be calculated based on appropriate costs, revenues, and discount rates. A financial advisor should be consulted for all individual investment analyses.

The following are assumptions with which the financial analysis is derived:

### Site Preparation

One pass with a subsoiler \$15/acre

Two passes with small disc/ (6 ft. double gang disc) 10/ pass

One pass site prep mowing/ (6 ft. brush hogging) 15/pass

### Establishment

Trees planted at 6' X 6' spacing / (1210 trees/acre)

1210 trees	.10/tree
Hand planting	.08/tree
Layout cost(staking and flagging rows)	.02/tree
<b>Weed Control</b>	
Band spray glyphosate first four years (\$60/gal) (30 gal. trailer mounted sprayer behind tractor, 45 psi, two to three gal./min, three nozzles, <sup>3</sup> / <sub>4</sub> qt/acre)	51.60
Apply simizine years five, six, and seven (1 lb/acre, \$1.40/lb, labor- 14.40/acre, equipment- 10.00/acre)	25.80
Mowing, four times each year @\$10/mow	40.00
<b>Culturing</b>	
1210 trees per acre until harvest (note t/a change)	
Shearing (primarily labor cost of hand shearing)	.06-.07/tree
Handles (primarily labor cost of hand pruning)	.03/tree
Tops (primarily labor cost of hand shaping)	.03/tree
Colorant (60 trees/gal, \$13/gal = .221tree)	.221tree
Colorant labor	.28/tree
<b>Pest Control</b>	
Pesticide	31.00
Dimilin for three flights (\$7/acre)	
Bravo or other fungicide two times/year (\$5/acre)	
Labor (\$5/acre/appl.)	25.00
Trapping (trap cost - \$30/yr)	30.00
<b>Other Expenses</b>	
Irrigation (one time materials and labor est.)	980.00
Water cost (first three years - \$20/yr)	20.00
<b>Farm Expenses (yearly expenses)</b>	
Taxes/Rent (annual per acre)	42.50
(avg. regional land taxes - 12.50/acre/yr, avg. land rent for region - 20/acre/yr)	
Equipment (yearly portion per acre)	62.00
(hand tools, tractors, misc. implements averaged over seven years)	
Mileage (annual per acre)	62.50
(avg. for 20 acres - 5000 miles/yr 42?.25/mile)	
<b>Harvest Cost</b>	
350 trees/acre/yr/harvestable yrs. five, six, seven	
Inventory and tag trees	(.10/tree sold)
Retailing cost-labor and incidentals	(1.00/tree sold)
<b>Selling Price</b>	
\$3.50 per foot, year six (five-foot tree), year seven (six-foot tree), year eight (seven-foot tree)	

\* Sales tax is not included

## Advantages and Disadvantages

### Advantages

1. Christmas tree production represents a viable alternative enterprise to produce supplemental income for the landowner.
2. Christmas trees can be grown on any small area of idle land of acceptable productivity and easily integrated into an existing farm operation.
3. Existing farm machinery can normally be used in establishing and maintaining a Christmas tree operation.
4. Growing Christmas trees can be rewarding, especially if one likes to tend trees and watch them grow.

### Disadvantages

1. Growing Christmas trees requires an initial upfront investment with no returns for at least several years.
2. Production can be risky due to tree damage and mortality from weather events, diseases, insects, and animals.
3. Production is labor intensive and requires time and effort to monitor and culture trees.
4. The Christmas tree industry is a competitive business and risk exists for overproduction and local dumping of trees.

## Conclusion

There appears to be room in the marketplace for additional Christmas tree growers in Oklahoma. However, potential growers are encouraged to understand the requirements of the production process and the risks in the national marketplace before making the decision to plant trees. Growers are encouraged to plant one or two acres the first year to familiarize themselves with the physical requirements prior to making large investments. With a commitment to growing quality, a full understanding of the biological and physical needs of trees, and a well thought-out marketing plan, growing Christmas trees in Oklahoma can be a profitable and rewarding experience.

## Additional Information

After reviewing this fact sheet, if the reader is still interested in growing Christmas trees, then they can refer to two videotapes produced at Oklahoma State University. One is a five part training series titled "Growing Christmas Trees in Oklahoma" (VT 208). The five parts include:

- An Introduction to Growing Christmas Trees
- Site Preparation and Planting
- Insect and Disease Control
- Pruning and Shearing Harvesting and Marketing

The second videotape is a 1 1/2 hour videoconference (TC 86) produced in cooperation with the National Christmas Tree Association titled "Survival in the Christmas Tree Industry." It provides a description of the current market climate and explores the future market outlook. These videotapes also should be reviewed prior to deciding to enter the Christmas tree industry. The videotapes can be borrowed free of charge through your local county extension center or can be purchased from Ag Communications Department, 141 Agriculture North, Oklahoma State University, Stillwater, Oklahoma, 74078 or (405) 744-4065.

**Table 1 . Cash flow for a 20-acre Christmas tree operation on a per acre basis**

<i>ITEM</i>	<i>Year</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>
	<i>Period</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<b>Costs:</b>								
<b>Site Preparation</b>								
Subsoiling		15.00	0	0	0	0	0	0
Disking		20.00	0	0	0	0	0	0
Mowing		15.00	0	0	0	0	0	0
<b>Establishment</b>								
Seedlings		121.00	0	0	0	0	0	0
Pianting		96.80	0	0	0	0	0	0
Layout		24.20	0	0	0	0	0	0
<b>Weed Control</b>								
Band Spraying		51.60	51.60	51.60	51.60	25.80	25.80	25.80
Mowing		40.00	40.00	40.00	40.00	40.00	40.00	40.00
<b>Culturing</b>								
Shearing		0	0	63.36	63.36	73.92	49.42	24.92
Handles		36.30	32.67	0	0	0	0	0
Tops		0	32.67	0	0	0	0	0
Colorant		0	0	0	0	175.00	175.00	175.00
<b>Pest Control</b>								
Application			25.00	25.00	25.00	25.00	25.00	25.00
25.00								
Chemical		31.00	31.00	31.00	31.00	31.00	22.00	13.00
Insect trapping		30.00	30.00	30.00	30.00	30.00	30.00	30.00
<b>Other</b>								
Irrigation		1000.00	20.00	20.00	0	0	0	0
Land Taxes/Rent		42.50	42.50	42.50	42.50	42.50	42.50	42.50
Equipment		62.00	62.00	62.00	62.00	62.00	62.00	62.00
Mileage		62.50	62.50	62.50	62.50	62.50	62.50	62.50
<b>Retailing</b>								
Tag and inventory		0	0	0	0	35.00	35.00	35.00
Retailing cost		0	0	0	0	350.00	350.00	350.00
<b>ANNUAL COST</b>		<b>1672.90</b>	<b>429.94</b>	<b>427.96</b>	<b>407.96</b>	<b>952.72</b>	<b>919.22</b>	<b>885.72</b>
<b>ACCUMULATED COST</b>		<b>1672.90</b>	<b>2102.84</b>	<b>2530.80</b>	<b>2938.76</b>	<b>3891.48</b>	<b>4810.70</b>	<b>5696.42</b>
<b>Revenues</b>								
Sale		0	0	0	0	6125.00	7350.00	8575.00
<b>ANNUAL REVENUE</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6125.00</b>	<b>7350.00</b>	<b>8575.00</b>
<b>ACCUMULATED REVENUE</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6125.00</b>	<b>13475.00</b>	<b>22050.00</b>
<b>ACCUMULATED CASH FLOW</b>		<b>- 1672.90</b>	<b>-2102.84</b>	<b>-2530.80</b>	<b>-2938.76</b>	<b>+2233.52</b>	<b>+8664.30</b>	<b>+ 16353.58</b>

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Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

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- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

**Acknowledgements: Photographs taken by Steven Anderson**

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