Cooperative Extension Service • Michigan State University
Extension Bulletin E-1172 • June 1992 (Revised)

Growing Christmas Trees In Michigan

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For many years Michigan has been a leading state in the production of plantation grown Christmas trees. Each year some 6 million trees are harvested and sold throughout the state and much of the nation. In fact, nearly 18 percent of all Christmas trees harvested in the United States come from Michigan.

There are many reasons why Christmas tree production is a large forest industry in Michigan. Favorable climatic factors, a broad mix of soil types and a semicentralized location all contribute to the production and marketing of several species and varieties of trees (Figure 1). Additionally, there exists in the state a large horticulturally related industry which is compatible with many aspects of Christmas tree production. Although several Christmas tree operations are large in size (more than 1000 acres), most are smaller, family operated businesses which employ seasonal labor to assist with the operation.

For some, establishing a Christmas tree business to generate additional income appears attractive. Such ventures can be profitable. However, would-be growers are advised to thoroughly investigate all aspects of production and marketing before undertaking such a project. This publication contains helpful information for potential growers and for newly established operations. It is not intended to encourage or promote the production of Christmas trees; rather, it provides answers to some basic questions concerning the industry.

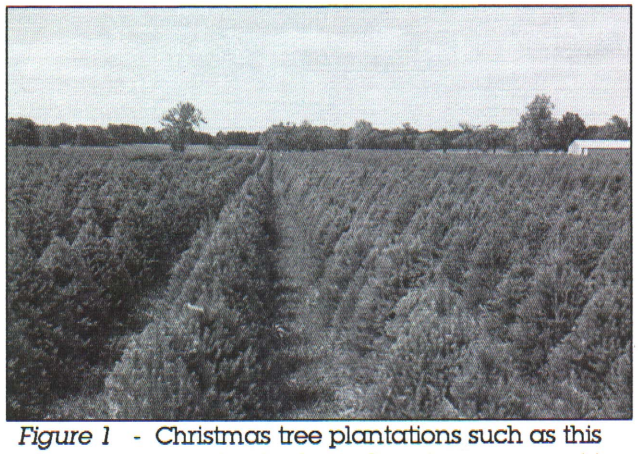

Figure 1 - Christmas tree plantations such as this Scotch pine stand in Ingham County are present in nearly all counties within the state.

A Marketing Plan

While this may appear to be a question which should be addressed once the production process is complete, it is necessary that it be considered at the beginning. The production and subsequent supply of Christmas trees available for market is cyclical. When the number of trees available for harvest is down, demand and profits are good. When supplies are ample, market demand is usually down and marketing trees is more difficult. Prices tend to decline as supplies increase and returns realized by the grower are less. A grower unable to sell trees will experience a substantial loss, not only in lost receipts but in time and effort as well (Figure 2). For this reason a workable, realistic marketing program should be developed before the production process begins. Failure to develop such a plan could result in substantial economic losses as well as much frustration.

Figure 2 - Developing an acceptable method of marketing Christmas trees is one of the most difficult challenges facing wholesale growers.

Reaching Market Size

The length of time required for trees to reach market size is variable depending on tree species, soil fertility, management skills and size desired. Occasionally Scotch pine and white pine trees will be of harvestable size and quality by the time they are six years of age (Figure 3). However, more commonly this will require seven or eight growing seasons. For spruces, true firs and Douglas fir, a minimum of eight years is necessary, with nine or ten years common for many situations. Intensive management, including effective weed control and maintenance of adequate soil fertility, may shorten the time required to produce a salable tree.

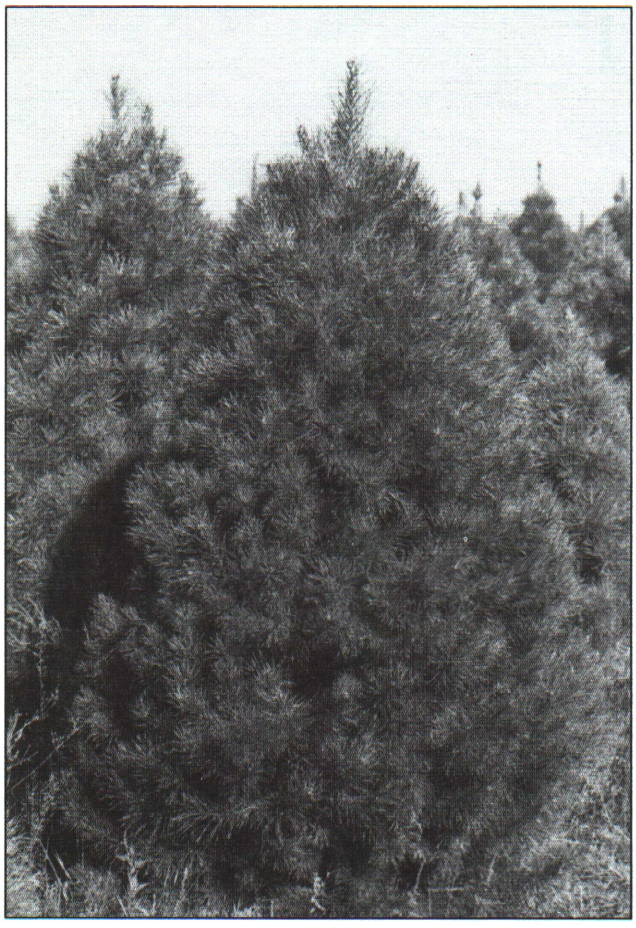

Figure 3 - Under intensive management, a 7-foot Scotch pine can be produced within six or seven years.

Figure 4 - Fraser fir, an increasingly popular Christmas tree species, is quite demanding with respect to site and soil requirements.

A Quality Product

A successful competitor in the Christmas tree business must produce trees of the highest possible quality. This requires more than planting, annual shearing and an occasional insect-controlling spray. Quality trees are characterized by straight stems, uniform taper, insect-disease free foliage, vigorous needles of good color, a generally lush appearance and absence of dead or off-colored foliage. This requires time and effort to complete such practices as staking, obtaining effective weed control, basal trimming, top or leader training as necessary and fertilization as appropriate. Unless a commitment is made to produce trees of the highest quality, it is likely difficulty will be encountered at the time the trees are ready to market.

Cash Flow Projection

Prior to beginning a Christmas tree production venture, it is recommended that a cash flow projection be prepared. This projection must include all anticipated expenditures (seedlings, planting costs, chemicals, labor, etc.) as well as fixed carrying costs such as land payments (if mortgaged), property taxes, insurance costs, etc. It must be realized these annual costs will be sustained for a minimum of six or seven years before any income is received. Furthermore, because market conditions several years in the future are uncertain, it is recommended that a conservative estimate of sales receipts be made. Overestimating anticipated revenues may result in the inability to continue the operation simply because it is unprofitable, or reducing the amount of care and cultural practices provided to the trees, thereby lowering their quality and making them more difficult to market.

Growing Areas

Christmas trees can be grown in all parts of the state although some areas are better suited than others. A few species such as Douglas fir, Concolor fir and Fraser fir are more demanding with respect to site than others (Figure 4). In particular these species require sites with good air drainage. Additionally they will not produce high quality trees when planted on wet or otherwise poorly drained sites. For other species such as Scotch pine, which is considered hardy throughout the state, specific varieties are better adapted to some locations than others. As an example, the planting of Spanish varieties is generally restricted to the southern third of the state, while Turkish or Scandinavian varieties are very hardy in the colder northern regions.

While a species can be identified which will grow in any particular region of the state, it should be remem-

bered that harvesting of large numbers of trees may be more difficult in the northern part of the state due to heavy snow conditions which are frequently present in late fall. Furthermore, the distance to large metropolitan marketing areas is greater for trees planted in northern Michigan plantations.

Preferred Soils

Many of the conifer species grown for Christmas trees will grow satisfactorily on a wide variety of soil types. However, there are some preferred soil types. Pines are generally adapted to sandy or sandy loam soils while spruces and firs (including Douglas fir) will grow best on fine-textured loams and clay loams. Some species will perform equally well on both soil types as long as adequate fertility and moisture are present. It is essential that soils be well drained. Generally speaking, Christmas tree plantations will not be profitable on low-lying soils where poor surface and internal drainage is present.

Land Requirements

This will depend on how much time, effort and money is available to establish and manage the plantation. Approximately 1,210 trees can be planted on an acre of land with the trees spaced 6 feet both ways (normal spacing). Firs are occasionally planted somewhat closer (5 1/2 x 6 feet). In actual practice, however, the number planted will be slightly less (1,000+), since some space will be used for access lanes, turning areas, etc. For hobby or supplemental income purposes, nearly any size area can be used, depending on the level of activity and income desired. For commercial operations producing trees for the wholesale market, a 40-acre plantation is probably minimum size; larger acreages (around 100) are more cost-efficient. Large operations mean more efficient use of time and equipment and greater income. Several ages of trees must be present to support sustained annual harvests; thus, only a small fraction (approximately 1/10) of the total acreage in a plantation will be harvested in any one year.

Common Species

The soils, topography and climate of Michigan are nearly ideal for the production of Christmas trees. More than eight species are produced in commercial operations in the state. Historically native species like balsam fir and white spruce were important. However, today it is common to plant many non-native species as well.

Scotch pine is the most commonly planted species in the state, although in the past few years, as a percentage of all trees planted, Scotch pine numbers have declined. This species has enjoyed wide popularity due to its relatively rapid growth rate, favorable response to plantation culture and adaptability to harvesting and shipping. More than 20 separate varieties of Scotch pine are available, reflecting differences in needle length, hardiness and winter color.

A few other pines are also grown for Christmas trees. They include Austrian, eastern white pine and red or Norway pine. Southwestern and western white pine have also been planted by a few producers. Pines are suited to coarse-textured soils and do well when planted on areas of sandy soil which are unsuitable for producing other agricultural crops.

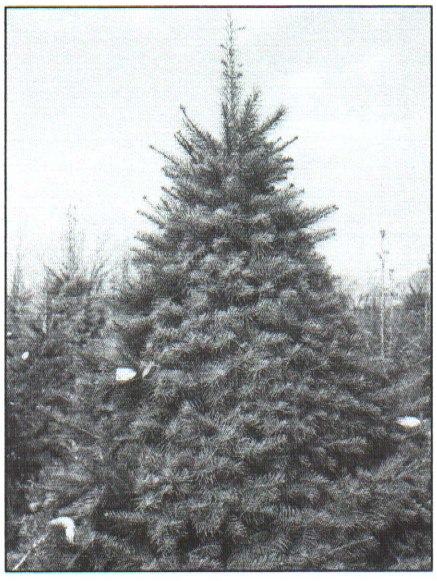

Figure 5 - Plantings of true fir species, such as this concolor fir, are increasing, although intensive management is necessary to produce quality trees.

Figure 6 - Tree planting machines greatly increase the rate of tree planting. The soil must be firmly packed around the roots to assure maximum survival.

In addition to the pines, several other species can be grown and managed to produce Christmas trees. White spruce is well suited to finer textured, upland soils. Blue spruce generally grows well throughout the state and is gaining popularity as a Christmas tree species. Occasionally the entire tree with roots attached is dug, potted and used as a "living" Christmas tree. Following the holidays it can be planted outdoors as an ornamental. Of all the spruces, blue spruce has the best "keeping qualities" but presents the greatest difficulty in harvesting and handling. Norway spruce grows well, although poor needle retention prevents this from being a widely marketable tree.

Douglas fir of Rocky Mountain origin is commonly grown along the Great Lakes and on inland sites where air drainage is good. It is susceptible to injury from late spring frosts, especially when planted on non-upland sites. Douglas fir is not well adapted to wet soils. As with other non-native species grown for Christmas trees, geographic origin of seed for planting stock is of considerable importance to survival and growth. Douglas fir is often considered to be a premium Christmas tree species and is highly recommended where soils and sites are favorable.

Recently, Fraser and balsam fir have increased in popularity and accordingly are being more widely planted. Fraser fir in particular is a very desirable species, although it is among the most difficult of all species to grow and develop into a quality tree. Site selection is critical; soils on wet sites or soils which tend to be drouthy are unacceptable. Little variation in seed source exists. Planting stock produced from the seed of native Appalachian region trees is widely available. Other firs occasionally planted include concolor or white fir and grand fir (Figure 5). Interest exists in other fir species; however, most of these have not been established as hardy and adaptable to Michigan conditions.

Planting Trees

The majority of commercial tree operations in the state establish new plantations using machine planters (Figure 6). Hand planting is mostly confined to small operations and to replacing trees which have died in established plant-

ings, or for plantings in rough or inaccessible areas. The rate of planting with a machine is substantially faster; well organized planting crews can plant 1000 or more trees per hour. In contrast, an experienced hand planter can only plant up to 800, or at most 1000, trees per day.

Survival can be excellent using either hand or machine planting methods. Likewise, low survival rates can result from either method. With both methods it is essential that the planting hole or slit be deep enough to allow the roots to be spread naturally and not become jammed or twisted. Failure to have good root distribution is one of the most common reasons for poor survival and growth in many plantations. Furthermore it is necessary that the soil be firmly packed around the seedling or transplant, to prevent drying and to ensure that adequate moisture relations be established and maintained.

Obtaining Planting Stock

To produce quality Christmas trees which will be competitive in the marketplace, it is essential that high-quality planting stock be used (Figure 7). For most operations this means purchasing either seedlings or transplants from a commercial nursery. A number of private tree seedling-transplant nurseries are present within the state. Most produce several different species and have planting stock from varying seed sources available. Planting stock is offered in different sizes and ages. Orders for nursery stock should be placed well in advance of the planting season, particularly if a specific seed source or size is desired.

Planting stock is classified as either seedlings or transplants. Seedlings designated as (1-0), (2-0) or (3-0) are produced from seed planted directly in the seedbed and allowed to remain there for one, two or three years. Plants of this type, usually 2-0 in size, are recommended for Scotch pine. White pine plantations have been successfully established using 3-0 seedlings. Seedlings are referred to as transplants when they are lifted from the seedbed after one or two years, then replanted in a second nursery bed where they remain for an additional year or more before being lifted again. Transplants are designated as (2-1), (2-2) or (3-1), etc. The sum of both numbers gives the age of the plant. Because of their larger root systems

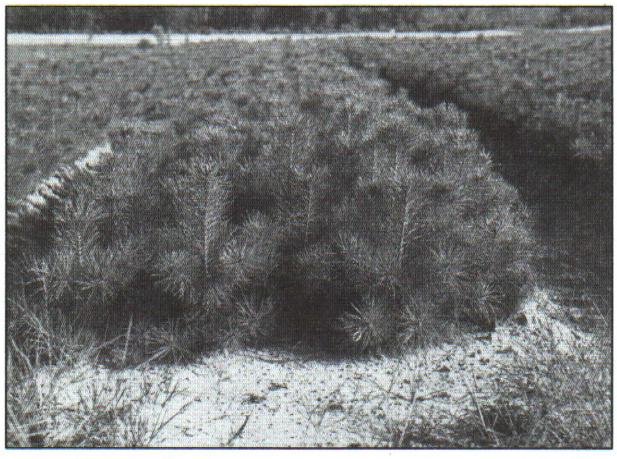

Figure 7 - Quality, vigorous planting stock is essential to rapidly produce trees which will be competitive in the marketplace.

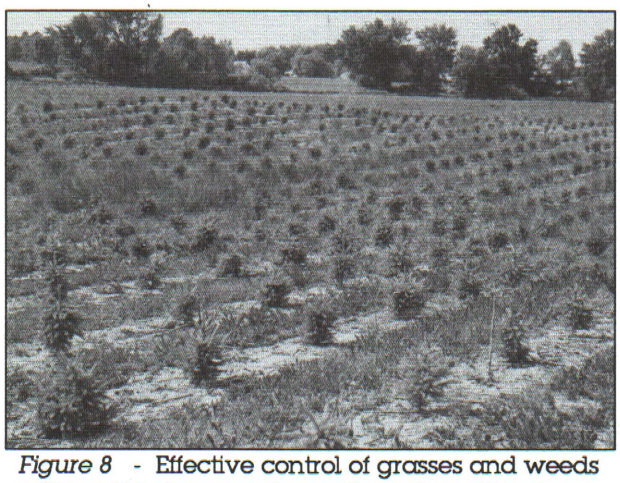

Figure 8 - Effective control of grasses and weeds will result in increased growth and quality of planted trees.

and stem diameters, transplants are recommended for firs such as balsam, Fraser and concolor as well as for Douglas fir and all spruces.

Caring for Trees

For newly planted Christmas trees to grow rapidly and to develop into quality trees, it is essential that competing vegetation growing near each tree be controlled (Figure 8). Grasses and weeds compete with newly planted and established trees for moisture and nutrients. Failure to control competitive plants will likely result in poor survival as well as reduced growth rates. Furthermore rodent, insect and disease problems may be more serious in a plantation where effective grass and weed control is not practiced.

Weed control is usually obtained by the use of chemicals, mowing or cultivation. Often a combination of two of these treatments is used. Several approved and labeled chemicals are available. Depending on the type of weed-grass problem present, herbicides may be used singly or in combination with one or more products. Mowing is generally done using small tractors or specially designed mowing units. Mowing is often combined with herbicides when chemicals are applied in bands over or beside the rows. Cultivation is not well adapted to Christmas tree plantations. Besides being impractical for large areas, it may cause root injury to established trees as well as contributing to increased soil erosion.

In addition to controlling competing vegetation, it is often necessary to correct crooks in tree stems or remove one or more multiple stems when present. Staking small trees is particularly important for some species such as Scotch pine. Removing doubles or other multiple shoots to permit the development of a single-stemmed straight tree is often necessary. Staking and correction of multiple stem problems is normally done during the second growing season following planting.

Objectives of Shearing

To develop quality trees which will be salable in a competitive marketplace, it is necessary that each tree be sheared (Figure 9). This practice usually begins when the trees are between two and three feet in height. For species such as Scotch pine, this normally occurs in the second or third growing season. For firs, Douglas fir and spruce, shearing usually begins in the third or fourth year following planting. Shearing must continue for each year of the rotation including the year of harvest.

Two principal objectives are achieved by shearing. It permits the development of trees with a uniform characteristic shape and taper. It also results in increasing the foliage density of the tree by promoting the formation of more buds and therefore the development of more twigs and branches. Shearing is absolutely essential to produce trees with full foliage and uniform symmetry.

The time of shearing is important. With pines, shearing should be done during early- to midsummer when height growth is nearly complete. The actual dates to begin the shearing process will vary, depending on species and location within the state. For pines, shearing in southern lower Michigan begins around June 10 to 15; further north, shearing will begin a week to ten days later. In all locations within the state,

shearing of pine species should be completed by the first week in August. Among the pines, it is important to shear the longer needled species such as Austrian and eastern white pine early in the shearing period, in order to obtain a good bud set.

With spruces and firs, including Douglas fir, shearing generally begins around the first of August. Because tree response differs from pines, shearing can occur anytime during the dormant season as well. Shearing can continue during the winter and even early spring before new growth begins. However, research studies and grower experiences have indicated that tree response is usually better if shearing is done in late summer or early fall.

Several types of tools and equipment can be used to shear Christmas trees. While the majority of Christmas tree shearing uses hand tools such as hedge clippers or shearing knives, mechanical units are increasing in popularity. Power shearing equipment can substantially increase shearing productivity, although some hand work will still be necessary on most trees. Whatever type of shearing equipment is used, proper safety equipment and procedures should be observed.

Insect and Disease Problems

Prompt identification and management of potentially damaging insect and/or disease problems is a must for high quality Christmas trees. Unlike most other forestry ventures, the value of Christmas trees is not dependent on wood properties or qualities. Christmas tree value is largely determined by overall appearance. Appearance is a reflection of shape, foliage density, tree fullness, needle color and uniformity.

Any factor which detracts from one or more of these characteristics is of concern to the Christmas tree grower (Figure 10). Even minor infestations of some insects and/or diseases can be destructive. While the Christmas tree producer may be able to keep insect and disease problems at low levels through management practices, chemical pesticide treatments likely will be necessary at some time in the course of the rotation. Fortunately, several approved pest control materials are available. In contrast to other intensively managed tree crops such as nut or fruit orchards, there is no need to follow a specific spray schedule which involves several treatments each year. Rather, the Christmas tree producer should regularly inspect his/her trees and take the action necessary to control a specific problem when it is detected.

Figure 9 - Shearing to shape and increase foliage density must be completed annually if quality trees are to be produced.

Insect and disease problems can be difficult to diagnose and control. For additional information on specific pests, consult the references at the end of this bulletin.

Timing the Harvest

The number of years required to pro-

Figure 10 - If not controlled, insects such as this pine needle scale infestation can result in non-salable trees.

Figure 11 - This white pine required eight years to reach a height of nine feet. With less intensive management, more time would have been necessary.

duce a tree ready for harvest depends on the species of tree present, the harvest size desired and the cultural practices conducted during the rotation (Figure 11). To produce a six- to seven-foot Scotch pine, an average of seven to nine years is necessary. If smaller or larger sized trees are desired, the production time interval will be more or less. For species such as the true firs, Douglas fir or Colorado blue spruce, the production period will usually be a couple of years longer. This time can be reduced if intensive management practices are applied.

The actual time required will be influenced by soil type, cultural and management practices including shearing procedures, and genetic characteristics related to geographic origin of the seed. In general, growth rates are slightly faster for trees growing in the southern portion of the state than for those growing in more northern locations.

Once proper size has been attained, harvesting will usually begin in late fall. Large commercial operations begin harvesting Scotch pine in late October and will continue through November and early December if necessary. Harvesting of true firs, Douglas fir and Colorado blue spruce occurs later. In large plantations it is necessary to begin harvest operations early to avoid unfavorable weather and to meet delivery demands by retailers. Producers who have fewer trees to harvest usually delay the beginning of harvest for as long as possible. Following harvest, trees are cleaned, baled and transported to shaded storage yards where they remain until shipment to retail sales outlets.

Factors Affecting Profits

Total net profits which can be realized from a Christmas tree operation are variable and depend on many factors. Among those of greatest importance are species grown, quality and size of tree produced, costs of management practices, length of the growing period required, land ownership costs and location and method of marketing. Related to marketing, options including wholesale, retail and choose-and-cut are available. Location may restrict the ability to develop a retail or choose-and-cut facility.

Tree supply and market demand are among the factors most related to price. Because these are subject to constant change, it is difficult to obtain an accurate profit expectation since both wholesale and resale prices are impacted.

While profits cannot be projected, some information on production costs can be provided. To be sure, these will vary significantly based on size of tree produced, local labor costs and management efficiencies. However, the table below reflects general estimates for Scotch pine.

When converted to an average per tree production cost, a value of $5.37 ($4030.00/750) is obtained. This average figure can be used as a basis for establishing selling prices and profit margins.

It must be stated that these are only average values and do not reflect cost changes which may occur as a result of severe insect-disease problems, weather-incurred losses, etc. Likewise, the cost of equipment required to perform some of the operations listed is not included. This is an important item and must be accounted for; however, much of the equipment needed is available if other farming operations are conducted. If not, a sizable cost

	Annual Costs	8- year Accumulated Costs
Site Preparation Costs	$ 50.00/acre	$ 50.00
Cost of Planting	$ 135.00/1000 seedlings	$ 135.00
Stock Planting Costs	$ 100.00/1000 seedlings	$ 100.00
Weed Control Costs	$ 25.00/acre/year	$ 400.00
Mowing Costs	$ 15.00/acre/year	$ 120.00
Insect-Disease Control Costs	$ 20.00/acre/year	$ 160.00
Trimming-Shearing Costs	$ 120.00/acre/year	$ 960.00
Tinting-Harvesting Costs	$1125.00/acre (75% harvest)	$1125.00
Land Cleanup Costs	$ 100.00/acre	$ 100.00
Management Costs	$ 35.00/acre/year	$ 280.00
	Total	**$4030.00**

share must be allocated to equipment purchase. On the other hand, additional income resulting from better management (more trees planted per acre or higher percentage of trees harvested) is likewise not included.

Nevertheless, this compilation does present relative levels of costs to expect in an average Scotch pine operation. As with all ventures involving the production of agricultural crops, the management abilities and skills of the operator greatly influence the level of success of the operation.

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