

AGRICULTURAL ALTERNATIVES

Christmas Tree Production

Christmas tree production is an enterprise that many small or part-time farmers often consider as an option for their unused, open land. To avoid costly mistakes, however, it is important to carefully plan for the establishment and marketing of your potential Christmas tree crop. Small-scale producers often consider their Christmas tree planting as an investment or income for their retirement, while larger operations regard the plantation as their primary occupation. To be successful, you must be able to invest seven to ten years of hard work and money in your trees before any revenue is received. Market research and planning is a key consideration because there is no guarantee that there will be a market for the trees when they are ready to be harvested.

The ready-cut Christmas tree industry started in the mid-nineteenth century with trees cut from the forest. The planting of trees in plantations began in the early twentieth century and increased greatly after the Second World War. According to the latest *Census of Horticultural Specialties* (2009), there are currently about 2,700 Christmas tree operations in the United States. Of these, about three-quarters sell trees retail and about one-half sell at least some of their trees wholesale. The most common trees produced are the Fraser fir, Douglas fir, and Colorado blue spruce. Other important varieties (depending on regional preferences) include white pine, balsam fir, Scotch pine, white spruce, noble fir, grand fir, and Leyland cypress. Sales of Christmas trees in the United States are around \$250 million each year.



Marketing

Market and potential profitability should also be considered when deciding what tree species to grow. For example, wholesale prices for desirable species such as Douglas fir and Fraser fir are significantly higher than for Scotch pine. Carefully choose the species you will plant based on research of what grows and sells well in your area.

Decisions on where and how you are going to market your trees must be made several years prior to harvest or before planting. Contacting potential buyers may be one of your biggest challenges; try to get your name on as many “buyer lists” as possible. Storage and loading areas will have to be developed for both retail and wholesale marketing.

If local service clubs or fire companies sell trees during the holiday, you may want to ask where they purchase their trees. Capturing this wholesale market may increase your future retail marketing potential in the community. Delivering a few trees for them to examine will help them

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determine whether or not they would like to purchase from you.

If you are planning a cut-your-own marketing strategy for your production, you should consider advertising both locally and regionally. Regional interest will depend on drive time and several other things, including:

- Are there other growers in your immediate area?
- Are you near a major road?
- Are there affordable methods of advertising in your immediate area?

You will also need a sales area and safe and convenient parking for your customers. You should have some trees cut for those customers who do not want to or cannot walk through your field(s). Either a hand-operated or motorized baler should be available for those who desire this service. You may need one in your sales area and one in the field(s) you are harvesting. Baling trees before loading for the wholesale market is important because it will allow the hauler to transport more trees with less damage.

Site Selection

Traditionally, land was used to grow Christmas trees if it was not suitable for production of other crops. Waste or barren land or fields that were too steep to safely operate tractors and equipment on were planted in trees. When tree prices were relatively low, this may have made sense. Today, there are few agricultural crops that have as high a potential value as Christmas trees; to ensure a high-quality product, it is best to start with good agricultural land.

The land can be flat, but preferably the land should be gently sloping to provide air and surface water drainage. Because cold air settles downward to the base of slopes or in the valleys, it is often much colder in these locations than on more elevated fields. Frost-sensitive species should not be planted on the lowlands as frost may damage young trees and shoots and delay harvest for at least a year. Try to avoid planting on severe slopes that can make operating equipment hazardous. Remember that tractors with very narrow wheel bases are required for operating between tree rows and these are more susceptible to rollover accidents.

Many soil problems can be avoided by studying a soil survey of the potential site prior to planting. County soil surveys developed by the USDA National Resources Conservation Service are available for free online (soils.usda.gov/survey/online_surveys). All of the most popular Christmas tree species are sensitive to “wet feet” or excess moisture at the roots. Serious root rot problems occur on poorly drained soils. Surface drainage problems are usually the most evident and can be corrected with sod waterways and ditches. Subsurface drainage problems

are more difficult to correct. For example, a shallow clay hardpan or rock layer may hold water very close to the soil surface. Subsurface drainage problems can be a problem in the late winter and spring if the soil experiences a seasonally high water table. One or two months of this high water table may be all it takes to cause severe injury or tree death.

On the other hand, some soils—usually those with a high amount of sand or shale—have a low water-holding capacity. Trees may do well on these sites in years with normal or above-average rainfall, but in dry years they may be stunted or killed. For instance, Douglas fir often survives when Fraser fir will not. Where these soil types are present, irrigation may be necessary. Having a water source such as a well, pond, or stream on the land is not absolutely necessary, but it does simplify many tasks. Hauling water for spraying, cleaning, and watering trees during drought conditions is an added burden and expense.

Rocks can be a problem if they are large enough to interfere with mechanical planting. Even then, rocky areas can be hand-planted if the soil is otherwise suitable for trees. If there is any chance that the trees will be dug for nursery stock, rocky soils should be avoided.

Test the soil the season before planting for the basic nutrient elements (phosphorus, potassium, calcium, and magnesium) and pH. Apply any needed fertilizers, lime, or other soil amendments before planting. Soil test kits are available at your local extension office. Eliminate perennial weeds by either plowing and disking the field and planting a cover crop or treating with labeled herbicides.

Production

Intensive planning and cultural work is needed to produce high-quality Christmas trees. Operations include selection and evaluation of planting sites; species and seed source selection; proper planting techniques; weed, insect, and disease control; fertilization; and tree shearing to improve form and density. Unless these operations are carried out properly, trees are usually of low quality and cannot be sold on the competitive market at premium prices. Sometimes they cannot be sold at all.

Growing and marketing Christmas trees is labor intensive and the work may often need to be done under adverse weather conditions. Much of the physical labor (shearing) is completed during the warm summer months. Rain or snow during the marketing season may mean that difficult conditions for cutting for the wholesale market and deter retail customers from coming to your plantation. Depending on your acreage and schedule, you may need to hire additional seasonal labor. Many jobs can be done by hired help if they are provided proper instructions and training.

Preplanting

Make sure the species you select to grow are adapted to the site. For example, Douglas fir will tolerate soils with a low water capacity better than Fraser fir, but Fraser fir is not nearly as susceptible to injury by late frosts as Douglas fir.

Within any given Christmas tree species there may be a lot of variation among seed sources. Different seed origin may result in different growth rate, insect and disease susceptibility, hardiness, frost susceptibility, ability to recover from frost injury, color, form, or potential to produce a high percentage of high-quality trees. Buy from reputable nurseries that can provide information about their seed sources and base your selection on this information. Check with other local producers to determine the most reputable nurseries.

Planting

Trees should be planted as soon as possible in the spring so they have a chance to develop new root growth before top growth begins. Tree spacing should be carefully planned to maximize density while allowing adequate room for growth and machinery operation. Remember to consider the space needed to operate spraying or mowing equipment around mature trees when determining row width.

Do not twist or bend the roots in the planting hole. Trees may be planted by hand with a shovel or by using a tractor and transplanter suitable for seedlings. This type of equipment can be rented to reduce initial start-up costs.

Maintenance

Fertility should be managed through periodic soil testing and foliar analysis. Starting with and maintaining a healthy soil structure will help ensure production of marketable trees in the shortest possible time.

Application of herbicides, fungicides, and insecticides will result in spraying the trees or under the trees at least six to seven times per season. After approximately the third growing season, each tree will need to be sheared on an annual basis and pruned at the base during the second shearing. Grass strips between the rows will usually require mowing at least two to three times per season.

Other Considerations

Everyone who grows trees loses some every year—it's simply a matter of how many. A partial list of reasons trees can be lost or of poor quality includes the following:

- Theft
- Drought
- Poor planting stock
- Poor shearing
- Insects
- Diseases
- Rodents
- Mower damage
- Herbicide misapplication
- Vandalism
- Fire

In addition to potential losses, there are several other things that potential growers should keep in mind. The uncertainty involved in planting a crop that can't be harvested for six to eight years is difficult for some people to deal with even under normal market conditions. Managing and training employees is important in avoiding liability issues. These include those relating to workplace injuries and situations that arise from having the general public on your operation. In addition, equipment must be well maintained so that it doesn't break down when it is needed most.

Operating a Christmas tree plantation is physically demanding and requires a year-round commitment. Planting is often done on cold, windy, and/or cloudy days very early in spring. Hand- or mechanical planting requires constant bending. Most mowing and shearing is done in hot and humid conditions during June through August. Tree harvest usually takes place during periods of cold, wet weather, including snow and sleet.

Pest Management

You should become familiar with the many pests that attack Christmas trees and how to control these pests before planting your trees. Pest monitoring may be conducted by you, an employee, or a professional who is familiar with Christmas trees. Scouting or monitoring should be conducted weekly during the growing season and several times throughout the winter months. Weather conditions may have an impact on the amount of scouting needed, depending on the pests.

Insect populations can be predicted by using growing degree day (GDD) calculations. Insect life cycles are based on the amount of heat accumulation, and GDD calculations predict when insects should be controlled. Growing degree days may be calculated by using the following formula:

$$\frac{\text{Low Temperature} + \text{High Temperature}}{2} - 50^{\circ}\text{F} = \text{Daily GDD}$$

This formula can be used to project the life stages and generations of a particular insect, which is then used to determine when an insecticide application is required. Some of the most important insects you will need to become familiar with include mites, gypsy moths, sawflies, scale, adelgids, bagworms, weevils, bark beetles, and midges.

Most diseases affecting Christmas trees are fungal diseases. Commercial fungicides are used to protect the tree rather than eliminate an existing disease. Cool temperatures, high moisture, and poor air circulation encourage the development of fungal diseases. Diseases that affect Christmas trees include cankers, galls, needle casts, rusts, rots, and blights.

Weeds will also have an impact on the growth and development of trees by competing with the Christmas trees for soil moisture and nutrients. Weeds also make it difficult to walk through the plantation and inhibit air circulation. You can control weeds by regularly mowing between the rows and by using labeled herbicides in the rows between the trees.

There are also other pests to consider when growing Christmas trees. These include birds, which may break young shoots on the tree; deer, which will eat or rub their antlers on the trees; and rodents, which will girdle the trees during winters when snow is on the ground for extended periods. Air pollution can also have an impact on tree growth.

Many of the pesticides required for Christmas tree production are restricted-use pesticides and require a pesticide license to purchase. Pesticide applicator tests are usually administered at county extension offices, so contact your local office for dates and times of these examinations. When using any pesticides in your enterprise, remember to follow all label recommendations regarding application rates, worker re-entry intervals, and personal protection equipment (PPE) requirements. Also remember that any Worker Protection Standards (WPS) apply to the owner as well as to employees.

Shearing

Shearing is necessary to give the tree its proper shape. However, tight shearing when the tree is young lengthens the time to harvest and produces a tight canopy that is hard to penetrate with pesticide sprays. Because of this, trees should be only lightly trimmed until they are 4 to 5 feet tall. Study your market to determine whether an open, more “natural” looking tree is preferred over a tightly sheared tree. Shearing can be done with a sharp machete for small acreages, but it is most often done with a power pruner.

Harvesting

Determining when to start cutting trees and how to cut (with a handsaw, chainsaw, or mower with a saw blade) are important management considerations. Extreme care and safety precautions must be followed while cutting trees no matter which method is chosen. Keep your or your employees’ physical capabilities in mind when choosing harvesting tools. For example, a handsaw may be somewhat safer, but it is more physically demanding. Mechanical harvesting methods will require equipment maintenance (cleaning, repairs, and sharpening) daily. You will need to allow time for this in your harvest planning.

Protecting harvested trees from wind, heat, and sunlight is critical to maintaining freshness. It is important to develop a handling and storage area where the trees

will be protected while they are being processed and prepared for sale.

Most producers will experience lower-than-expected quality for some of their trees at harvest. This reduction may be due to crooked trunks, blank spaces in the limb structure, and off color. These reductions can result in harvesting approximately two-thirds as first quality trees and one-third as seconds or “off” quality trees. This reduction in quality may be of no fault of the producer, but you must take this into account when planning your marketing strategy and creating your production budget.

Environmental Regulations

In the normal course of operations, farmers handle pesticides and other chemicals, may have manure to collect and spread, and use equipment to prepare fields and harvest crops. Any of these routine on-farm activities can be a potential source of surface water or groundwater pollution. Because of this possibility, you must understand the regulations to follow concerning the proper handling and application of chemicals and the disposal and transport of waste. Depending on the watershed where your farm is located, there may be additional environmental regulations regarding erosion control, pesticide leaching, and nutrient runoff. Contact your soil and water conservation district, extension office, zoning board, state departments of agriculture and environmental protection, and your local governing authorities to determine what regulations may pertain to your operation.

Risk Management

Several risk management strategies are available for you to employ in your operation. You should insure your facilities and you also may want to insure your crops as well. Insuring your farm may be accomplished by consulting your insurance agent or broker. Make sure your employees are properly trained about pesticides and how to use equipment. Check with your insurance agent to review liability issues and workers compensation laws. For more information on agricultural business insurance, see *Agricultural Alternatives: Agricultural Business Insurance*.

Christmas trees are currently uninsurable through traditional crop insurance policies. However, they are insurable through the Noninsured Crop Disaster Assistance Program (NAP). Through this program, you must have greater than a 50 percent loss and the insurance will pay 50 percent of the value of the lost crop. The NAP sales closing date is September 30; coverage begins on October 1 and is available through your local Farm Service Agency (FSA) office. You must file an acreage report by September for the acres you wish to insure. Contact your local FSA office for more details.

You may insure your income from Christmas trees through a whole-farm revenue protection program called AGR-Lite. To use AGR-Lite you must have five years of Internal Revenue Service (IRS) Schedule F forms. If your business structure is either a C or S corporation, the necessary information can be entered into a Schedule F for crop insurance purposes. You can then contact an agent who sells crop insurance and insure the income of your operation. For more information concerning crop insurance, contact a crop insurance agent or check the Penn State Extension crop insurance website at extension.psu.edu/crop-insurance.

Depending on your marketing strategy, you may be inviting the public onto your land. For more information about liability, see *Agricultural Alternatives: Understanding Agricultural Liability*.

Income Tax Implications

The Internal Revenue Service (IRS) views Christmas tree production as a long-term investment. Because of this, the land preparation and establishment expenses must be capitalized. This means that these expenses cannot be immediately deducted as operating expenses. They are only deducted when you begin to sell trees from this enterprise. However, during the growing period of the trees (years three through ten) normal operating expenses may be deducted (although you may wish to capitalize these expenses also).

To be able to deduct the normal operating expenses, you must be a material participant in the enterprise. This means you must meet one of the following examples:

- You must participate for more than 500 hours in a taxable year.
- You must be the sole participant in the activity for the year.
- You participate more than 100 hours and no other person spends more time on the enterprise.
- You must have materially participated in a Christmas tree activity for five of the past ten years.
- You must meet a facts and circumstances test.

Before beginning any Christmas tree enterprise you should contact your tax adviser to determine your options concerning the IRS tax codes and potential tax liability. For more information about federal income taxes on farmers, see *Agricultural Alternatives: Understanding Your Federal Farm Income Taxes*.

Acquiring Land

If you do not already own the land for your operation, the acquisition of land may be the single largest initial cost you will face. When acquiring land, the decision must be made whether to buy or lease. Buying land gives

the business a degree of security and permanence. Structures can then be built and the land developed exactly as you like. Land that is relatively flat and within 10 miles of a population center can be developed into a choose-and-cut retail operation. This type of land will have a significantly higher cost than land that is isolated and can only be used for wholesale production.

The purchase of land requires a significant financial investment up front. By leasing land, more money can be made available to purchase equipment and trees. If leasing, there will usually be more land available to choose from since only a limited amount is up for sale each year. A simple cash lease involving payment based on acreage used per year is the most common form of lease. Other leases are written in a way that only minimal payments are made before harvest, and then the lessee shares in the profits. Leases should be written in a way that at least eight (preferably ten) years will be allowed to fully harvest the trees planted in a particular year. Each year the lease must be amended to allow another eight to ten years for newly planted trees.

Sample Budget

The sample enterprise budget included in this publication takes into account the reduction in quality (two-thirds number 1 and one-third number 2) of the total amount of trees and the loss of trees after the second year. New trees are planted after the first year, but none are planted after the second year due to harvesting the entire block over a three-year period. The budget is based on harvesting one-fourth the first year of harvest, one-half the second year of harvest, and one-fourth the last year of harvest.

Equipment may or may not be a major expense on your operation. Operations of only a few acres can be hand-planted and then maintained with walk-behind mowers and backpack sprayers. Total equipment costs may not exceed \$2,000. For smaller operations, using custom operators or renting equipment may be an option. For larger operations, equipment may be the next biggest investment after land, and again decisions must be made regarding whether to buy, rent, lease, or borrow.

The new grower is better off using three- to four-year-old transplants versus younger seedling trees. The survival, establishment, and early growth of transplants is better and they should reach marketable size earlier than seedlings. This early success of the planting is important for the confidence of the new grower, and it improves the overall economics of the enterprise.

The sample budget should help ensure that all costs and receipts are included in your calculations. Costs and returns are often difficult to estimate in budget preparation because they are numerous and variable. Therefore, you should think of these budgets as approximations and make appropriate adjustments in the "Your Estimate"

column to reflect your specific production and resource situation. More information on the use of crop budgets can be found in *Agricultural Alternatives: Enterprise Budget Analysis*.

Summary

Growing Christmas trees is a complex, high-risk business that requires a special type of person and a significant investment to get started. Before anyone plants their first tree, they should consider the physical work involved, the study required to learn all that is needed to grow a crop from start to finish, the length of time their money will be

invested before the first sale, and the risk involved. With hard work and careful planning, Christmas tree growing can be financially rewarding and personally satisfying.

Initial Resource Requirements

- Land: one acre
- Labor: \$4,500–5,500
- Capital: \$10,500–11,500
- Equipment needed: tractor (25–45 horsepower); sprayer (50–100 gallon); shearing equipment; saw (either handsaw or chainsaw)

Sample Budget: Christmas Tree Production for One Acre of Fraser Fir Trees.

Expenses based on 1,200 trees per acre with replacements planted the second year and harvesting 80 percent of the trees.

	Year										Total Costs	
	0-1*	2	3	4	5	6	7	8	9	10		
Direct Expenses												
Custom hire	\$103.40	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$193.40
Herbicides	\$21.93	\$12.89	\$44.73	\$27.85	\$21.39	\$16.75	\$44.73	\$27.85	\$16.75	\$27.85	\$27.85	\$262.72
Insecticides			\$56.03	\$3.90	\$14.57	\$59.93	\$14.57	\$14.57	\$59.93	\$14.57	\$238.07	
Fungicides				\$36.40	\$45.50	\$45.50	\$45.50	\$36.40	\$36.40	\$36.40		
Fertilizer	\$20.00	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$525.44	
Trees	\$1,620.00	\$243.00									\$1,863.00	
Grass seed	\$85.50											
Seasonal labor		\$23.63	\$104.40	\$307.20	\$150.00	\$246.00	\$246.00	\$246.00	\$184.80	\$61.20	\$1,569.23	
Operator labor	\$53.47	\$31.72	\$32.63	\$58.29	\$62.87	\$55.26	\$62.87	\$41.79	\$45.46	\$50.04	\$494.40	
Harvest costs*								\$277.00	\$553.00	\$276.00	\$1,106.00	
Diesel fuel	\$24.08	\$14.80	\$18.97	\$34.69	\$38.70	\$35.15	\$38.70	\$26.99	\$26.83	\$30.84	\$289.75	
Repairs and maintenance	\$15.84	\$10.02	\$9.98	\$18.22	\$19.58	\$17.33	\$19.58	\$12.70	\$14.10	\$15.46	\$152.81	
Interest on operating capital	\$67.24	\$12.76	\$6.29	\$9.20	\$7.73	\$8.96	\$9.66	\$15.39	\$16.12	\$11.42	\$164.77	
Total Direct Expenses	\$2,011.46	\$414.98	\$339.19	\$561.91	\$426.50	\$551.04	\$547.77	\$764.85	\$1,019.55	\$589.94	\$7,227.19	
Fixed Expenses												
Implements	\$25.17	\$9.94	\$9.62	\$15.36	\$16.21	\$13.26	\$16.21	\$11.32	\$12.49	\$13.34	\$142.92	
Tractors	\$13.17	\$7.46	\$10.20	\$18.76	\$21.10	\$19.31	\$21.10	\$14.88	\$14.48	\$16.82	\$157.28	
Land charge	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$1,500.00	
Total Fixed Expenses	\$188.34	\$167.40	\$169.82	\$184.12	\$187.31	\$182.57	\$187.31	\$176.20	\$176.97	\$180.16	\$1,800.20	
Total Expenses	\$2,199.80	\$582.38	\$509.01	\$746.03	\$613.81	\$733.61	\$735.08	\$941.05	\$1,196.52	\$770.10	\$9,027.39	

*Year of land preparation. Much of land preparation completed using custom operators.

**Harvest costs are based on harvesting 25 percent in year 8, 50 percent in year 9, and 25 percent in year 10 and include cutting, dragging, and baling. You should monitor local markets and contact suppliers to determine current prices for all items contained in this sample budget.

Sample Budget: Christmas Tree Production for One Acre of Douglas Fir Trees.

Expenses based on 1,200 trees per acre with replacements planted the second year and harvesting 80 percent of the trees.

	Year									Total Costs	
	0-1*	2	3	4	5	6	7	8	9		
Direct Expenses											
Custom hire	\$88.80	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$168.80
Herbicides	\$18.88	\$6.64	\$16.75	\$44.73	\$27.85	\$16.75	\$27.85	\$44.73	\$27.85	\$27.85	\$232.03
Insecticides			\$63.83	\$14.57	\$14.57	\$59.93	\$14.57	\$14.57	\$59.93	\$59.93	\$241.97
Fungicides			\$36.40	\$36.40	\$36.40	\$36.40	\$36.40	\$36.40	\$36.40	\$36.40	\$254.80
Fertilizer/lime	\$20.00	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$56.16	\$469.28
Trees	\$1,320.00	\$198.00									\$1,518.00
Grass seed	\$85.50										
Seasonal labor		\$21.00	\$104.40	\$307.20	\$150.00	\$246.00	\$246.00	\$184.80	\$61.20	\$61.20	\$1,320.60
Operator labor	\$53.47	\$24.11	\$37.85	\$50.04	\$53.07	\$42.43	\$53.07	\$50.04	\$50.04	\$50.04	\$414.12
Harvest costs**							\$277.00	\$553.00	\$276.00	\$276.00	\$1,106.00
Diesel fuel	\$24.08	\$11.25	\$23.28	\$30.84	\$30.38	\$27.29	\$30.38	\$30.84	\$30.84	\$30.84	\$239.18
Repairs and maintenance	\$15.84	\$7.77	\$11.85	\$15.46	\$16.35	\$13.21	\$16.35	\$15.46	\$15.46	\$15.46	\$127.75
Interest on operating capital	\$40.12	\$11.09	\$6.60	\$9.65	\$7.40	\$8.26	\$15.86	\$16.61	\$12.48	\$12.48	\$128.07
Total Direct Expenses	\$1,666.69	\$346.02	\$367.12	\$575.05	\$402.18	\$516.43	\$783.64	\$1,012.61	\$636.36	\$636.36	\$6,306.10
Fixed Expenses											
Implements	\$25.17	\$6.99	\$9.54	\$13.34	\$15.44	\$10.39	\$15.44	\$13.34	\$13.34	\$13.34	\$122.99
Tractors	\$13.17	\$5.67	\$12.69	\$16.82	\$16.27	\$15.03	\$16.27	\$16.82	\$16.82	\$16.82	\$129.56
Land charge	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00	\$1,350.00
Total Fixed Expenses	\$188.34	\$162.66	\$172.23	\$180.16	\$181.71	\$175.42	\$181.71	\$180.16	\$180.16	\$180.16	\$1,602.55
Total Expenses	\$1,855.03	\$508.68	\$539.35	\$755.21	\$583.89	\$691.85	\$965.35	\$1,192.77	\$816.52	\$816.52	\$7,908.65

*Year of land preparation. Much of land preparation completed using custom operators.

**Harvest costs are based on harvesting 25 percent in year 8, 50 percent in year 9, and 25 percent in year 10 and include cutting, dragging, and baling. You should monitor local markets and contact suppliers to determine current prices for all items contained in this sample budget.

Douglas Fir: Wholesale Sales—Returns Above Total Costs for Various Price and Yield Combinations

Two-third of trees are sold as number 1 quality and one-third as number 2 quality.

Price Received per Number 1 Tree	Price Received per Number 2 Tree	Yield (Number 1 and Number 2 Trees per Acre)				
		700	800	900	1,000	1,100
\$16.00	\$7.00	(\$208)	\$892	\$1,992	\$3,092	\$4,192
\$18.00	\$9.00	\$1,192	\$2,492	\$3,792	\$5,092	\$8,592
\$20.00	\$11.00	\$2,592	\$4,092	\$5,592	\$7,092	\$8,592
\$22.00	\$13.00	\$3,992	\$5,692	\$7,392	\$9,092	\$10,792
\$24.00	\$15.00	\$5,392	\$7,292	\$9,192	\$11,092	\$12,992

Fraser Fir: Wholesale Sales—Returns Above Total Costs for Various Price and Yield Combinations

Two-third of trees are sold as number 1 quality and one-third as number 2 quality.

Price Received per Number 1 Tree	Price Received per Number 2 Tree	Yield (Number 1 and Number 2 Trees per Acre)				
		700	800	900	1,000	1,100
\$18.00	\$9.00	\$73	\$1,373	\$2,673	\$3,973	\$5,273
\$20.00	\$11.00	\$1,473	\$2,973	\$4,473	\$5,973	\$7,473
\$22.00	\$13.00	\$2,873	\$4,573	\$6,273	\$7,973	\$9,673
\$24.00	\$15.00	\$4,273	\$6,173	\$8,073	\$9,973	\$11,873
\$26.00	\$17.00	\$5,673	\$7,773	\$9,873	\$11,973	\$14,073

For More Information

Recommended Species for Christmas Tree Plantings
#NCR479 (\$6.75)

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Southern New England Christmas Tree Growers Manual
Publication #92-11 (\$4.00 + \$2.00 S+H)

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www.christmastreesny.org/for_the_grower/documents/Weedcontrolhandout.pdf

Other Publications

Christmas Tree Farming: Christmas Tree Cultivation, Christmas Tree Production, Christmas Tree Pests and Weeds, Rouse Simmons. Memphis, TN: General Books, 2010.

Greaser, G. L., and J. K. Harper. *Agricultural Alternatives: Enterprise Budget Analysis*. University Park: Penn State Cooperative Extension, 1994.

Kime, L. F., J. A. Adamik, E. E. Gantz, J. K. Harper. *Agricultural Alternatives: Agricultural Business Insurance*. University Park: Penn State Cooperative Extension, 2004.

Websites

A Guide to Farming in Pennsylvania: extension.psu.edu/farm-business/guide

Penn State Department of Entomology: ento.psu.edu/extension/christmas-trees

Pennsylvania Christmas Tree Growers Association:
www.christmastrees.org

University of Minnesota: ipmworld.umn.edu/chapters/mccull.htm

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