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# **Christmas Tree Economics: Establishing and Producing Douglas-Fir Christmas Trees in Western Oregon**

*James W. Julian, Chal Landgren, Michael C. Bondi, and  
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## **Introduction**

Nationwide Christmas tree growers harvested 17.4 million trees in 2007, down from 20.8 million in 2002 (USDA Census of Agriculture, 2007). Oregon's share was 6.9 million trees in 2007, up from 6.5 million trees in 2002. Oregon led the nation in Christmas tree production accounting for 39 percent of the 2007 volume up from 31 percent from 2002.

In 2007 Oregon's Christmas tree production and sales were as follows: acres in Christmas tree production 61,850; number of trees harvested – 6.9 million; and value of sales - \$109 million. Trees are grown in several Oregon Counties, but four; Clackamas, Marion, Polk and Benton counties produce over 80% of the states total.

Two tree species, Douglas-fir and noble fir account for over 90% of the tree sales among the various species grown. In 2007, as over the past three decades Douglas-fir accounted for the largest percentage of trees sold. In 2008, noble fir is expected to occupy that position for the first time. Noble fir has become a popular Christmas tree commanding a higher market price relative to Douglas-fir. Over the past 10

years, acreage planted to noble have increased and recently surpassed Douglas-fir.

Douglas-fir is typically a lower cost option for consumers and major markets for Oregon trees are in Southwest United States and Mexico.

Douglas-fir is widely grown and its culturing is well understood. It grows well from the Valley floor to upper elevations, is a native species in the region, and prefers well to moderately well drained soils. Planting survival in our irrigated fields is typically around 95%. The production cycle ranges in length from 5 to 7 years depending upon site, seed source, harvest size, and grower experience.

This cost of production study provides growers with a tool for financial management and decision making. It was conducted in cooperation with growers, field representatives, researchers, and farm suppliers and provides typical costs and returns to a well managed Douglas-fir Christmas tree farm in the Willamette Valley of Oregon. Growers are encouraged to substitute their own costs to get an accurate accounting of their costs.

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<sup>1</sup> James W. Julian, Faculty Research Assistant NWREC, Aurora; Chal Landgren, Christmas Tree Specialist NWREC, Aurora; Michael C. Bondi Forestry and Christmas tree Extension faculty Clackamas Co. Oregon; Clark F. Seavert, Extension Economist NWREC, Aurora. The assistance provided by Christmas tree producers, field representatives, farm suppliers, and researchers in developing this budget is greatly appreciated.

## Assumptions

In the preparation of this publication, the following assumptions were made to provide a basis for Christmas tree production analysis.

1. Typical acreage for Christmas tree production in Oregon is 10 acres of non-irrigated land.
2. 1,500 trees are transplanted per acre (5.5' x 5.5' spacing)
3. Prices for 6 to 7 ft Douglas-fir Christmas trees are \$10.29 for Grade #1 and \$7.71 for Grade #2 per tree. Prices based upon 2005 to 2007 average prices listed by USDA National Agriculture Statistic Service. ([http://www.nass.usda.gov/Statistics\\_by\\_State/Oregon/Publications/Horticulture/09\\_12xt.pdf](http://www.nass.usda.gov/Statistics_by_State/Oregon/Publications/Horticulture/09_12xt.pdf); (Table 2) accessed 9/09). Price per tree for study derived from listed average price by assuming average tree is 7ft. The price of Grade 2 trees are 25% of Grade 1 trees
4. Douglas-fir Christmas tree harvest begins in year 5 and continues through year 7 with 90 percent of planted trees harvestable.
5. All labor is hired at a rate of \$14.00 per hour, which includes worker's compensation, unemployment insurance, and other labor overhead expenses, or is paid a piece rate for some operation.
6. The machinery and equipment used in the budget reflects the typical machinery complement of a small Oregon Christmas tree farm. A detailed breakdown of machinery values is shown in Table 1. Table 2 provides estimated machinery costs from the American Society of Agricultural Engineers. Table 3 lists the estimated cost of each operation.
7. Gasoline and diesel costs per gallon are \$2.00 and \$2.50, respectively.
8. The interest rate on operating funds is 8.5 percent and treated as a cash expense. One-half of the cash expenses are borrowed for a six-month period.
9. Machinery, housing facilities, and land are owned by the operator and assessed 8.5, 8.5, and 8 percent interest rates, respectively, as opportunity costs (a non-cash cost for the use of the asset). Land is valued at \$5,000 per acre.
10. Previous year's establishment costs are funded by the operator at a charge of 10 percent interest and are considered an opportunity cost.
11. Additional assumptions are listed for variable, fixed cash, and fixed non-cash costs in Table 4.
12. Price inflation for the time period of this study was ignored.
13. Owner management, family living, State and Federal income tax consequences are also ignored for this study.

Table 1. Machinery Cost Assumptions, Douglas-Fir Christmas Tree Production

| Machine             | Size             | Market Value | Hours or Miles of Annual Use | Expected Life (yrs) | Salvage Value |
|---------------------|------------------|--------------|------------------------------|---------------------|---------------|
| Tractor             | 2 WD 35hp, Older | \$12,000     | 300                          | 20                  | \$1,540       |
| Fertilizer Spreader | 40' Broadcast    | 1,500        | 4                            | 15                  | \$144         |
| Airblast Sprayer    | 300 gal          | 15,000       | 100                          | 15                  | 1,440         |
| Pickup*             | 3/4 Ton 4X4      | 8,000        | 4,000                        | 10                  | 3,025         |
| Backpack Sprayer    |                  | 150          | N/A                          | 7                   | 0             |
| Elevator            |                  | 2,000        | N/A                          | 15                  | 192           |
| Tree Baler          |                  | 3,000        | N/A                          | 15                  | 288           |
| Shop/Shed           | 25' x 50'        | 25,000       | N/A                          | 35                  | 0             |

\* Pickup for Christmas tree production is 1/3 of total cost.

Table 2. Machinery Cost Calculations, Douglas-Fir

| Machin                     | Siz        | --- Variable Costs --- |                 | --- Fixed Costs --- |           | Tota Cost |
|----------------------------|------------|------------------------|-----------------|---------------------|-----------|-----------|
|                            |            | Fuel & Lub             | Repair & Maint. | Depr. Interes       | Insurance |           |
| ----- Costs per Hour ----- |            |                        |                 |                     |           |           |
| Tractor                    | 2 WD 35hp, | \$14.38                | \$0.50          | \$3.66              | \$0.20    | \$18.74   |
| Fertilizer                 | 40'        | 0.00                   | 0.26            | 40.07               | 1.23      | 41.56     |
| Airblast Sprayer           | 300        | 0.00                   | 6.95            | 16.03               | 0.49      | 23.47     |
| ----- Costs per Mile ----- |            |                        |                 |                     |           |           |
| Pickup*                    | 3/4 Ton    | \$0.19                 | \$0.15          | \$0.24              | \$0.08    | \$0.66    |
| ----- Costs per Acre ----- |            |                        |                 |                     |           |           |
| Backpack Sprayer           |            | \$0.00                 | \$2.14          | \$2.78              | \$0.00    | \$4.92    |
| Elevato                    |            | \$0.00                 | \$12.05         | \$21.83             | \$0.00    | \$33.89   |
| Tree Baler                 |            | 0.00                   | 18.08           | 32.75               | 0.00      | 50.83     |
| Shop/She                   | 25' x      | 0.00                   | 71.43           | 177.68              | 0.00      | 249.11    |

\* Pickup for Christmas tree production is 1/3 of total cost.

Table 3. Estimated Cost of Each Operation with Power-Unit, Doulgas-Fir Christmas Tree Production.

| Operation           | Tractor  | Miles per Hr | Acres per Hr | ----- Machine Costs ----- |                        |                     |                     |
|---------------------|----------|--------------|--------------|---------------------------|------------------------|---------------------|---------------------|
|                     |          |              |              | Labor Cost per Acre       | Variable Cost per Acre | Fixed Cost per Acre | Total Cost per Acre |
| Fertilizer Spreader | 2WD 35hp | 6.0          | 3.00         | \$4.67                    | \$5.05                 | \$15.05             | \$24.77             |
| Airblast Sprayer    | 2WD 35hp | 6.0          | 3.00         | \$4.67                    | \$7.27                 | \$6.79              | \$18.73             |

Table 4. Douglas-Fir Christmas Tree Production Input Assumptions for Variable, Harvest, and Fixed Costs.

|   | <u>Year 1</u>                 | <u>Year 2</u> | <u>Year 3</u> | <u>Year 4</u> |
|---|-------------------------------|---------------|---------------|---------------|
| Prices per 6-7' Grade #1 Tree, (\$/Tree)          | \$10.29                       | \$10.29       | \$10.29       | \$10.29       |
| Prices per 6-7' Grade #2 Tree, (\$/Tree)          | \$7.72                        | \$7.72        | \$7.72        | \$7.72        |
| Trees Harvested (Grade #1), per Acre              | 0.00                          | 0.00          | 0.00          | 0.00          |
| Trees Harvested (Grade #2), per Acre              | 0.00                          | 0.00          | 0.00          | 0.00          |
| Cost of Labor, per Hour                           | \$14.00                       | \$14.00       | \$14.00       | \$14.00       |
| Cost to Plant Trees, per Tree                     | \$0.30                        | \$0.50        | \$0.00        | \$0.00        |
| Cost of Foliar Testing, per Acre                  | \$0.00                        | \$0.00        | \$5.00        | \$5.00        |
| Cost of Shearing Labor, per Tree                  | \$0.00                        | \$0.00        | \$0.25        | \$0.35        |
| Cost of Basal Pruning, per Tree                   | \$0.00                        | \$0.00        | \$0.25        | \$0.00        |
| Cost for Tagging Trees, per Tree                  | \$0.00                        | \$0.00        | \$0.00        | \$0.00        |
| Cost for Shagging, per Tree                       | \$0.00                        | \$0.00        | \$0.00        | \$0.00        |
| Cost for Baling Trees (Including Twine), per Tree | \$0.00                        | \$0.00        | \$0.00        | \$0.00        |
| Cost for Loading Trees, per Tree                  | \$0.00                        | \$0.00        | \$0.00        | \$0.00        |
| Cost to Cutting Trees, per Tree                   | \$0.00                        | \$0.00        | \$0.00        | \$0.00        |
| Cost of Fertilizer, per Acre                      | \$0.00                        | \$0.00        | \$0.00        | \$200.00      |
| Cost of Insecticide, per Acre                     | \$0.00                        | \$0.00        | \$0.00        | \$20.00       |
| Cost of Fungicide, per Acre                       | \$0.00                        | \$0.00        | \$0.00        | \$25.00       |
| Cost of Herbicide, per Acre                       | \$25.00                       | \$25.00       | \$25.00       | \$25.00       |
| Time for IPM Scouting, Hours                      | 0.50                          | 0.50          | 0.50          | 0.50          |
| Time to Fertilize, Hand Appl., Hours              | 0.00                          | 0.00          | 0.00          | 1.00          |
| Time for Spot Herbicide Sprays, Hours             | 1.60                          | 1.60          | 1.60          | 1.60          |
|   | ----- Fixed Input Costs ----- |               |               |               |
| Property Taxes                                    | \$15.00                       | \$15.00       | \$15.00       | \$15.00       |
| Property Insurance                                | \$25.00                       | \$25.00       | \$25.00       | \$25.00       |
| Land Values                                       | \$5,000                       | \$5,000       | \$5,000       | \$5,000       |
| Tree Cost   | \$0.50                        | \$0.50        | \$0.00        | \$0.00        |
| Gasoline Price                                    | \$2.00                        | \$2.00        | \$2.00        | \$2.00        |
| Diesel Fuel Price                                 | \$2.50                        | \$2.50        | \$2.50        | \$2.50        |
| Operating Interest Rate                           | 8.50%                         | 8.50%         | 8.50%         | 8.50%         |
| Machinery Interest Rate                           | 8.50%                         | 8.50%         | 8.50%         | 8.50%         |
| Land Interest Rate                                | 8.00%                         | 8.00%         | 8.00%         | 8.00%         |
| Establishment Interest Rate                       | 10.00%                        | 10.00%        | 10.00%        | 10.00%        |
| Overhead Charge                                   | 8.00%                         | 8.00%         | 8.00%         | 8.00%         |
| % of Operating Capital Borrowed                   | 50.00%                        | 50.00%        | 50.00%        | 50.00%        |
| Months to Borrow Operating Capital                | 6.0                           | 6.0           | 6.0           | 6.0           |
| Planted Trees                                     | 1,500                         | 75            | 0             | 0             |

Table 4. Douglas-Fir Christmas Tree Production Input Assumptions for Variable, Harvest, and Fixed Costs, (con't).

|   | <u>Year 5</u>                 | <u>Year 6</u> | <u>Year 7</u> |
|---|-------------------------------|---------------|---------------|
| Prices per 6-7' Grade #1 Tree, (\$/Tree)          | \$10.29                       | \$10.29       | \$10.29       |
| Prices per 6-7' Grade #2 Tree, (\$/Tree)          | \$7.72                        | \$7.72        | \$7.72        |
| Trees Harvested (Grade #1), per Acre              | 150.00                        | 600.00        | 200.00        |
| Trees Harvested (Grade #2), per Acre              | 0.00                          | 300.00        | 100.00        |
| Cost of Labor, per Hour                           | \$14.00                       | \$14.00       | \$14.00       |
| Cost to Plant Trees, per Tree                     | \$0.00                        | \$0.00        | \$0.00        |
| Cost of Foliar Testing, per Acre                  | \$5.00                        | \$5.00        | \$5.00        |
| Cost of Shearing Labor, per Tree                  | \$0.45                        | \$0.50        | \$0.55        |
| Cost of Basal Pruning, per Tree                   | \$0.00                        | \$0.00        | \$0.00        |
| Cost for Tagging Trees, per Tree                  | \$0.30                        | \$0.30        | \$0.30        |
| Cost for Shagging, per Tree                       | \$0.75                        | \$0.75        | \$0.75        |
| Cost for Baling Trees (Including Twine), per Tree | \$0.85                        | \$0.85        | \$0.85        |
| Cost for Loading Trees, per Tree                  | \$0.65                        | \$0.65        | \$0.65        |
| Cost to Cutting Trees, per Tree                   | \$0.40                        | \$0.40        | \$0.40        |
| Cost of Fertilizer, per Acre                      | \$200.00                      | \$200.00      | \$50.00       |
| Cost of Insecticide, per Acre                     | \$20.00                       | \$20.00       | \$20.00       |
| Cost of Fungicide, per Acre                       | \$25.00                       | \$25.00       | \$25.00       |
| Cost of Herbicide, per Acre                       | \$25.00                       | \$25.00       | \$25.00       |
| Time for IPM Scouting, Hours                      | 0.50                          | 0.50          | 0.50          |
| Time to Fertilize, Hand Appl., Hours              | 1.00                          | 1.00          | 1.00          |
| Time for Spot Herbicide Sprays, Hours             | 1.60                          | 1.60          | 1.60          |
|   | ----- Fixed Input Costs ----- |               |               |
| Property Taxes                                    | \$15.00                       | \$15.00       | \$15.00       |
| Property Insurance                                | \$25.00                       | \$25.00       | \$25.00       |
| Land Values                                       | \$5,000                       | \$5,000       | \$5,000       |
| Tree Cost   | \$0.00                        | \$0.00        | \$0.00        |
| Gasoline Price                                    | \$2.00                        | \$2.00        | \$2.00        |
| Diesel Fuel Price                                 | \$2.50                        | \$2.50        | \$2.50        |
| Operating Interest Rate                           | 8.50%                         | 8.50%         | 8.50%         |
| Machinery Interest Rate                           | 8.50%                         | 8.50%         | 8.50%         |
| Land Interest Rate                                | 8.00%                         | 8.00%         | 8.00%         |
| Establishment Interest Rate                       | 10.00%                        | 10.00%        | 10.00%        |
| Overhead Charge                                   | 8.00%                         | 8.00%         | 8.00%         |
| % of Operating Capital Borrowed                   | 50.00%                        | 50.00%        | 50.00%        |
| Months to Borrow Operating Capital                | 6.0                           | 6.0           | 6.0           |
| Planted Trees                                     | 0                             | 0             | 0             |

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## **Results of establishing and producing Douglas Fir Christmas trees in Western Oregon**

### *Cash flow analysis*

Table 5 contains a cash flow analysis for a 10 acre Douglas-fir Christmas tree farm. A cash flow analysis shows the cash costs required to produce Douglas-fir Christmas trees. Cash costs include labor, trees, fertilizer, chemicals, machinery repairs, fuel, lube, and oil, operating (short-term) interest, machinery and property taxes. The income, variable costs and cash fixed costs are shown for each of the four establishment years and at full production. Harvest begins in year 5 with 150 Grade 1 trees and increases to 900 trees (600 Grade 1 and 300 Grade 2) in year 6 and a final harvest of 300 trees (200 Grade 1 and 100 Grade 2) in year 7. Total variable costs are \$1,988 in the first year with an additional \$47 of cash fixed costs for a total cash cost of \$2,035 per acre.

The farm projects a positive cash flow beginning in year 6 with gross income exceeding total cash costs by \$4,155 per acre. In year 7, the farm returns sufficient gross income to pay all previous years' cash costs with a surplus \$162 over prior costs.

Figure 1 shows the major cost components in relation to total cash costs. Harvest costs are the largest cash expense representing 30 percent of the total cash costs followed by hired labor with 29 percent. Machine costs, which include fuel, oil, and repairs, are next with 9 percent. Fertilizer and chemicals and Overhead expenses are both 7 percent of the total cash costs and Christmas trees are 6 percent. The remaining cost items account for 12 percent of the total cash costs.

### *Economic costs and returns*

Table 6 details the economic costs and returns for a Christmas tree farm. Economic costs include all the cash costs from Table 5 plus ownership costs that are either an opportunity cost to the owner or dollars borrowed from a financial institution. These ownership costs include the principal and interest payments or a return on investment to the grower, or both, for machinery, and land, and funds to pay for previous year's costs.

Gross income exceeds variable and fixed costs in Year 6 with a \$2,360 per acre return to the grower. However, in year 7 gross income is \$367 less than costs. This Christmas tree farm does not generate enough revenue to cover cumulative production costs and at the end of the production cycle has a deficit of \$8,805 per acre.

Figure 2 shows the cost components in relation to total economic costs. When all economic costs are included, interest costs are the largest component at 19 percent of total costs. This is followed by harvest and hired labor costs accounting for 18 and 17 percent, respectively. Land costs are the next largest item at 13 percent of total costs. Machine costs (fuel, oil, repairs, depreciation, and interest charges) represent 9 percent of the total costs. The remaining cost items account for 24 percent of the total economic costs.

The net projected economic returns for a 10 acre Douglas-fir Christmas tree farm are shown in Figure 3. Both the cumulative cash and economic cost and returns are represented. The projected returns for this Christmas tree farm will cover all cash costs of establishment in 7 years. With the assumptions in this study, however, this farm will not generate sufficient gross incomes to cover all economic costs. In fact, even if the owner's rate of return on invested capital is zero, this farm is \$507

short of covering production and harvest costs (Figure 4). A sensitivity analysis of the change in price necessary to make this Christmas tree farm a prudent business investment indicates profitability, under

assumed interest rates, could be achieved by increasing the Christmas tree prices by 64 percent from \$10.29 and \$7.72 to \$16.88 and \$12.66 for grade 1 and 2 trees respectively (Figure 4).

Table 5. Cash Flow Analysis of Douglas-Fir Christmas Tree Production in Western Oregon.

|  | Year 1       | Year 2       | Year 3       | Year 4       | Year 5       | Year 6       | Year 7       |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>Income:</b>                           |              |              |              |              |              |              |              |
| Trees Harvested (Grade #1), per Acre     | 0.00         | 0.00         | 0.00         | 0.00         | 150.00       | 600.00       | 200.00       |
| Trees Harvested (Grade #2), per Acre     | 0.00         | 0.00         | 0.00         | 0.00         | 0.00         | 300.00       | 100.00       |
| Prices per 6-7' Grade #1 Tree, (\$/Tree) | 0.00         | 0.00         | 0.00         | 0.00         | 10.29        | 10.29        | 10.29        |
| Prices per 6-7' Grade #2 Tree, (\$/Tree) | <u>0.00</u>  | <u>0.00</u>  | <u>0.00</u>  | <u>0.00</u>  | <u>0.00</u>  | <u>7.72</u>  | <u>7.72</u>  |
| Gross Income(\$ per Acre)                | 0.00         | 0.00         | 0.00         | 0.00         | 1,543.50     | 8,489.25     | 2,829.75     |
| <b>Variable Costs:</b>                   |              |              |              |              |              |              |              |
| Field Preparation                        | 352.00       | 0.00         | 0.00         | 0.00         | 0.00         | 0.00         | 0.00         |
| Trees                                    | 750.00       | 37.50        | 0.00         | 0.00         | 0.00         | 0.00         | 0.00         |
| Chemicals                                | 8.25         | 8.25         | 8.25         | 53.25        | 53.25        | 53.25        | 8.25         |
| Fertilizer                               | 0.00         | 0.00         | 0.00         | 200.00       | 200.00       | 200.00       | 50.00        |
| Hired Labor (non-harvest)                | 493.40       | 66.90        | 779.40       | 568.40       | 718.40       | 718.40       | 290.90       |
| Harvest Cost                             | 0.00         | 0.00         | 0.00         | 0.00         | 442.50       | 2,655.00     | 885.00       |
| Equipment                                | 138.81       | 138.81       | 138.81       | 158.40       | 188.54       | 188.54       | 168.94       |
| Shop                                     | 71.43        | 71.43        | 71.43        | 71.43        | 71.43        | 71.43        | 71.43        |
| Miscellaneous and Overhead               | 133.11       | 25.83        | 80.23        | 84.52        | 139.33       | 311.33       | 118.36       |
| Interest: Operating Capital              | <u>41.37</u> | <u>7.41</u>  | <u>23.02</u> | <u>24.25</u> | <u>38.54</u> | <u>89.31</u> | <u>33.96</u> |
| Total Variable Costs                     | 1,988.37     | 356.13       | 1,101.14     | 1,160.25     | 1,851.98     | 4,287.26     | 1,626.84     |
| Gross Income minus VC                    | (1,988.37)   | (356.13)     | (1,101.14)   | (1,160.25)   | (308.48)     | 4,201.99     | 1,202.91     |
| <b>Fixed Cash Costs</b>                  |              |              |              |              |              |              |              |
| Insurance                                | 31.97        | 31.97        | 31.97        | 31.97        | 31.97        | 31.97        | 31.97        |
| Property Taxes                           | <u>15.00</u> | <u>15.00</u> | <u>15.00</u> | <u>15.00</u> | <u>15.00</u> | <u>15.00</u> | <u>15.00</u> |
| Total Fixed Cash Costs                   | 46.97        | 46.97        | 46.97        | 46.97        | 46.97        | 46.97        | 46.97        |
| Total Cash Cost                          | 2,035.35     | 403.10       | 1,148.11     | 1,207.22     | 1,898.95     | 4,334.23     | 1,673.81     |
| Annual Cash Flow                         | (2,035.35)   | (403.10)     | (1,148.11)   | (1,207.22)   | (355.45)     | 4,155.02     | 1,155.94     |
| Cumulative Cash Flow                     | (2,035.35)   | (2,438.45)   | (3,586.56)   | (4,793.78)   | (5,149.23)   | (994.21)     | 161.73       |



Table 6. Economic Costs and Returns of Douglas-Fir Christmas Tree Production in Western Oregon.

|  | Year 1       | Year 2        | Year 3        | Year 4        | Year 5        | Year 6          | Year 7        |
|--|--------------|---------------|---------------|---------------|---------------|-----------------|---------------|
| Income:                                  |              |               |               |               |               |                 |               |
| Trees Harvested (Grade #1), per Acre     | 0.00         | 0.00          | 0.00          | 0.00          | 150.00        | 600.00          | 200.00        |
| Trees Harvested (Grade #2), per Acre     | 0.00         | 0.00          | 0.00          | 0.00          | 0.00          | 300.00          | 100.00        |
| Prices per 6-7' Grade #1 Tree, (\$/Tree) | 0.00         | 0.00          | 0.00          | 0.00          | 10.29         | 10.29           | 10.29         |
| Prices per 6-7' Grade #2 Tree, (\$/Tree) | <u>0.00</u>  | <u>0.00</u>   | <u>0.00</u>   | <u>0.00</u>   | <u>0.00</u>   | <u>7.72</u>     | <u>7.72</u>   |
| Gross Income(\$ per Acre)                | 0.00         | 0.00          | 0.00          | 0.00          | 1,543.50      | 8,489.25        | 2,829.75      |
| Variable Costs:                          |              |               |               |               |               |                 |               |
| Field Preparation                        | 352.00       | 0.00          | 0.00          | 0.00          | 0.00          | 0.00            | 0.00          |
| Trees                                    | 750.00       | 37.50         | 0.00          | 0.00          | 0.00          | 0.00            | 0.00          |
| Chemicals                                | 8.25         | 8.25          | 8.25          | 53.25         | 53.25         | 53.25           | 8.25          |
| Fertilizer                               | 0.00         | 0.00          | 0.00          | 200.00        | 200.00        | 200.00          | 50.00         |
| Hired Labor (non-harvest)                | 493.40       | 66.90         | 779.40        | 568.40        | 718.40        | 718.40          | 290.90        |
| Harvest Cost                             | 0.00         | 0.00          | 0.00          | 0.00          | 442.50        | 2,655.00        | 885.00        |
| Equipment                                | 138.81       | 138.81        | 138.81        | 158.40        | 188.54        | 188.54          | 168.94        |
| Shop                                     | 71.43        | 71.43         | 71.43         | 71.43         | 71.43         | 71.43           | 71.43         |
| Miscellaneous and Overhead               | 133.11       | 25.83         | 80.23         | 84.52         | 139.33        | 311.33          | 118.36        |
| Interest: Operating Capital              | <u>41.37</u> | <u>7.41</u>   | <u>23.02</u>  | <u>24.25</u>  | <u>38.54</u>  | <u>89.31</u>    | <u>33.96</u>  |
| Total Variable Costs                     | 1,988.37     | 356.13        | 1,101.14      | 1,160.25      | 1,851.98      | 4,287.26        | 1,626.84      |
| Gross Income minus VC                    | (1,988.37)   | (356.13)      | (1,101.14)    | (1,160.25)    | (308.48)      | 4,201.99        | 1,202.91      |
| Fixed Costs:                             |              |               |               |               |               |                 |               |
| Insurance                                | 31.97        | 31.97         | 31.97         | 31.97         | 31.97         | 31.97           | 31.97         |
| Property Taxes                           | 15.00        | 15.00         | 15.00         | 15.00         | 15.00         | 15.00           | 15.00         |
| Machine Costs                            | 98.75        | 98.75         | 98.75         | 136.29        | 136.29        | 136.29          | 99.39         |
| Shop                                     | 177.68       | 177.68        | 177.68        | 177.68        | 177.68        | 177.68          | 177.68        |
| Land Interest Cost                       | 400.00       | 400.00        | 400.00        | 400.00        | 400.00        | 400.00          | 400.00        |
| Interest on Estab. Costs                 | <u>0.00</u>  | <u>271.18</u> | <u>406.25</u> | <u>629.83</u> | <u>885.43</u> | <u>1,080.91</u> | <u>845.40</u> |
| Total Fixed Cost                         | 723.40       | 994.58        | 1,129.65      | 1,390.76      | 1,646.36      | 1,841.85        | 1,569.43      |
| Total Cost                               | 2,711.77     | 1,350.71      | 2,230.78      | 2,551.01      | 3,498.34      | 6,129.11        | 3,196.27      |
| Net Projected Returns                    | (2,711.77)   | (1,350.71)    | (2,230.78)    | (2,551.01)    | (1,954.84)    | 2,360.14        | (366.52)      |
| Cumulative Returns                       | (2,711.77)   | (4,062.48)    | (6,293.26)    | (8,844.27)    | (10,799.12)   | (8,438.97)      | (8,805.49)    |

Figure 1. Cash Costs per Acre to Produce Douglas-Fir Christmas Trees in Western Oregon, by Percent.

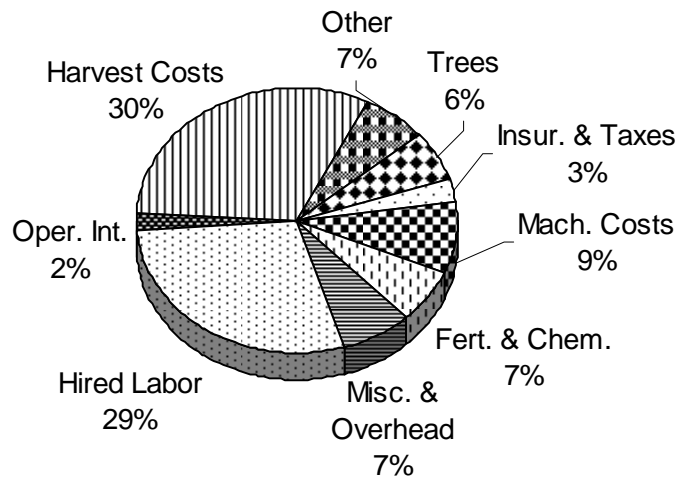
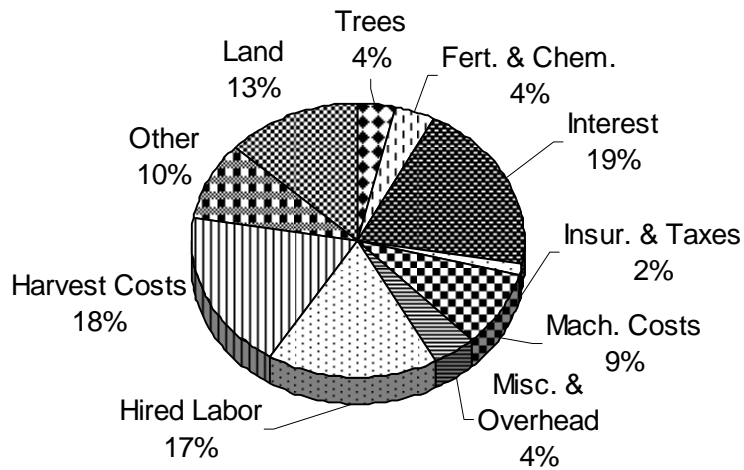
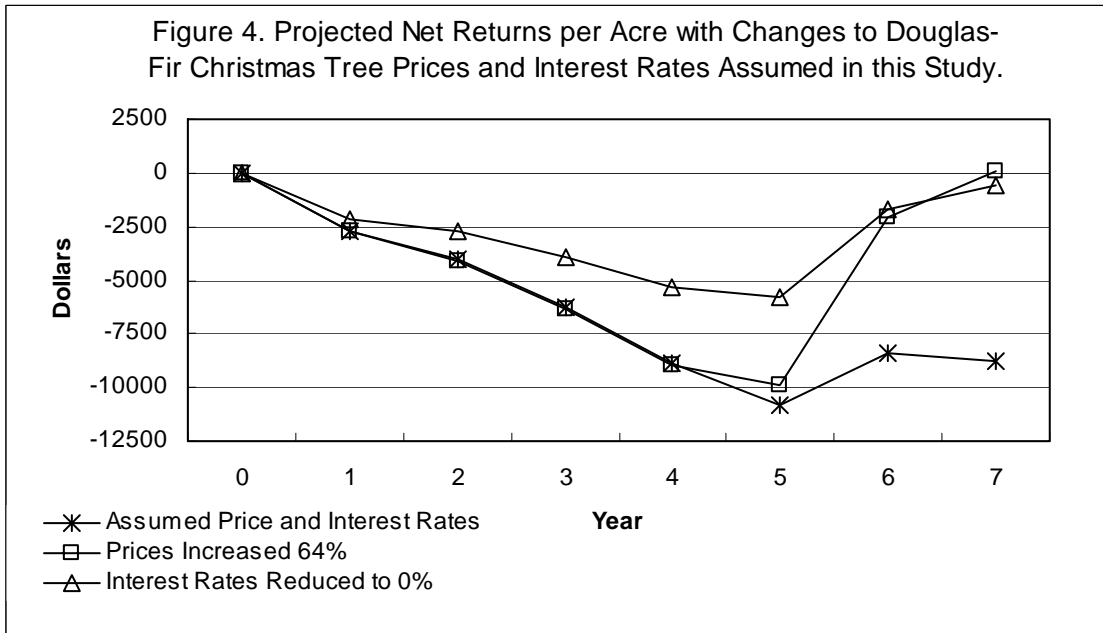
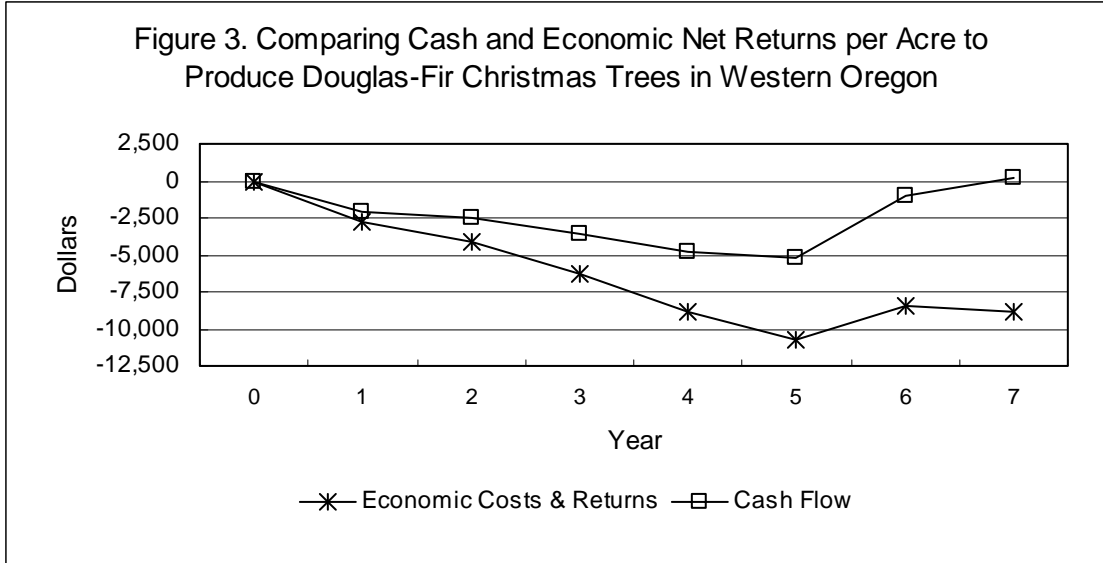


Figure 2. Economic Costs per Acre to Produce Douglas-Fir Christmas Trees in Western Oregon, by Percent.





## Discussion

Given the assumptions in this study, production of Douglas-fir Christmas trees does not appear to be a prudent investment as a significant increase in grower prices would be necessary in order for a grower to be profitable. The current low prices suggest a surplus of Douglas-fir inventory in the field. Therefore, Christmas tree growers planning new Christmas tree plantings

should consider market conditions 5 to 7 year in the future and determine to whom and how to market and sell the trees.

Current Christmas tree producers may want to consider a value added component to increase profitability. If Christmas tree growers are able to share in the value-added processes, such as U-Cut production or sales of ancillary products and or services they may be more likely to profit financially.

This cost of establishment study is meant to provide useful information to Christmas tree producers and investors who are considering planting Christmas trees. However, as with all enterprise budgets, putting your own current costs in the budget will make it more meaningful. Many tools are available to assist in budgeting such as templates from university farm management specialists and computer software programs such as “*Agricultures Profitability Tool*” (*AgProfit<sup>TM</sup>*). This program is free for download at the *Agtools<sup>TM</sup>* website [www.agtools.org](http://www.agtools.org). Talk with your local Extension agent to find the latest in Christmas tree production tools and budget information.

Growers must not forget the importance that a particular enterprise such as a Christmas tree farm can have in the overall financial stability of the farm business. Financial managers can recommend planting Christmas trees to improve profitability, but the financial requirements to complete the planting could jeopardize cash flows, increase the debt-to-asset ratio and diminish the solvency of the farm. There are many economic and financial considerations to review before such decisions are made. Seeking advice from university Extension and research faculty, industry representatives, or consultants can help in those decisions and keep your farm profitable and investments feasible.

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## **APPENDIX A**

### **Enterprise Budgets for Douglas-Fir Christmas Tree Production in Western Oregon**

Table 7. Douglas-Fir Christmas Tree Production, Year 1, Economic Costs and Returns, \$/Acre

| <u>VARIABLE CASH COSTS</u>               | <u>Description</u> | <u>Labor</u>  | <u>Machinery</u> | <u>Materials</u>   | <u>Total</u>        |
|--|--------------------|---------------|------------------|--------------------|---------------------|
| Field Preparation, Custom                |                    | 0.00          | 0.00             | 150.00             | 150.00              |
| Stump Removal, Custom                    |                    | 0.00          | 0.00             | 200.00             | 200.00              |
| Soil Test                                |                    | 0.00          | 0.00             | 2.00               | 2.00                |
| Field layout                             | 1.0 hour           | 14.00         | 0.00             | 0.00               | 14.00               |
| Plant Trees                              |                    | 450.00        | 0.00             | 750.00             | 1,200.00            |
| IPM Scouting                             | 0.5 hours          | 7.00          | 0.00             | 0.00               | 7.00                |
| Spot Spraying, Herbicide                 | 1.6 hour           | 22.40         | 2.14             | 8.25               | 32.79               |
| Pickup                                   |                    | 0.00          | 136.67           | 0.00               | 136.67              |
| Shop                                     |                    | 0.00          | 0.00             | 71.43              | 71.43               |
| Miscellaneous and Overhead               |                    | 0.00          | 0.00             | 133.11             | 133.11              |
| Interest: Operating Capital              | 6.0 mons           | <u>0.00</u>   | <u>0.00</u>      | <u>41.37</u>       | <u>41.37</u>        |
| <b>Total VARIABLE COSTS</b>              |                    | <b>493.40</b> | <b>138.81</b>    | <b>1,356.16</b>    | <b>1,988.37</b>     |
| <b><u>FIXED COSTS</u></b>                |                    |               |                  | <b><u>Unit</u></b> | <b><u>Total</u></b> |
| <b>CASH Costs</b>                        |                    |               |                  |                    |                     |
| Pickup Insurance                         |                    |               |                  | acre               | 31.97               |
| Property Taxes                           |                    |               |                  | acre               | <u>15.00</u>        |
| <b>Total CASH fixed Costs</b>            |                    |               |                  |                    | <b>46.97</b>        |
| <b>NON-CASH Costs</b>                    |                    |               |                  |                    |                     |
| Machinery and Equip - Dep., Int., & Ins. |                    |               |                  | acre               | 2.14                |
| Pickup - Depreciation & Interest         |                    |               |                  | acre               | 96.60               |
| Shop                                     |                    |               |                  | acre               | 177.68              |
| Land Interest Charge                     |                    |               |                  | acre               | 400.00              |
| Interest on Establishment Costs          |                    |               |                  | acre               | <u>0.00</u>         |
| <b>Total NON-CASH fixed Costs</b>        |                    |               |                  |                    | <b>676.43</b>       |
| <b>Total FIXED COSTS</b>                 |                    |               |                  |                    | <b>723.40</b>       |
| <b>Total of All Costs Per Acre</b>       |                    |               |                  |                    | <b>(2,711.77)</b>   |

Table 8. Douglas-Fir Christmas Tree Production, Year 2, Economic Costs and Returns, \$/Acre

| <u>VARIABLE CASH COSTS</u>               | <u>Description</u> | <u>Labor</u> | <u>Machinery</u> | <u>Materials</u> | <u>Total</u>      |
|--|--------------------|--------------|------------------|------------------|-------------------|
| Replant Trees                            |                    | 37.50        | 0.00             | 37.50            | 75.00             |
| IPM Scouting                             | 0.5 hours          | 7.00         | 0.00             | 0.00             | 7.00              |
| Spot Spraying, Herbicide                 | 1.6 hour           | 22.40        | 2.14             | 8.25             | 32.79             |
| Pickup                                   |                    | 0.00         | 136.67           | 0.00             | 136.67            |
| Shop                                     |                    | 0.00         | 0.00             | 71.43            | 71.43             |
| Miscellaneous and Overhead               |                    | 0.00         | 0.00             | 25.83            | 25.83             |
| Interest: Operating Capital              | 6.0 mons           | 0.00         | 0.00             | 7.41             | 7.41              |
| <b>Total VARIABLE COSTS</b>              |                    | <b>66.90</b> | <b>138.81</b>    | <b>150.42</b>    | <b>356.13</b>     |
| <u>FIXED COSTS</u>                       |                    |              |                  | <u>Unit</u>      | <u>Total</u>      |
| CASH Costs                               |                    |              |                  |                  |                   |
| Pickup Insurance                         |                    |              |                  | acre             | 31.97             |
| Property Taxes                           |                    |              |                  | acre             | 15.00             |
| <b>Total CASH Costs</b>                  |                    |              |                  |                  | <b>46.97</b>      |
| NON-CASH Costs                           |                    |              |                  |                  |                   |
| Machinery and Equip - Dep., Int., & Ins. |                    |              |                  | acre             | 2.14              |
| Pickup - Depreciation & Interest         |                    |              |                  | acre             | 96.60             |
| Shop                                     |                    |              |                  | acre             | 177.68            |
| Land Interest Charge                     |                    |              |                  | acre             | 400.00            |
| Interest on Establishment Costs          |                    |              |                  | acre             | 271.18            |
| <b>Total NON-CASH Costs</b>              |                    |              |                  |                  | <b>947.60</b>     |
| <b>Total FIXED COSTS</b>                 |                    |              |                  |                  | <b>994.58</b>     |
| <b>Total of All Costs Per Acre</b>       |                    |              |                  |                  | <b>(1,350.71)</b> |

Table 9. Douglas-Fir Christmas Tree Production, Year 3, Economic Costs and Returns, \$/Acre

| <u>VARIABLE CASH COSTS</u>               | <u>Description</u> | <u>Labor</u>  | <u>Machinery</u> | <u>Materials</u> | <u>Total</u>      |
|--|--------------------|---------------|------------------|------------------|-------------------|
| IPM Scouting                             | 0.5 hours          | 7.00          | 0.00             | 0.00             | 7.00              |
| Foliar Testing                           |                    | 0.00          | 0.00             | 5.00             | 5.00              |
| Spot Spraying, Herbicide                 | 1.6 hour           | 22.40         | 2.14             | 8.25             | 32.79             |
| Basal Pruning                            |                    | 375.00        | 0.00             | 0.00             | 375.00            |
| Shearing                                 |                    | 375.00        | 0.00             | 0.00             | 375.00            |
| Pickup                                   |                    | 0.00          | 136.67           | 0.00             | 136.67            |
| Shop                                     |                    | 0.00          | 0.00             | 71.43            | 71.43             |
| Miscellaneous and Overhead               |                    | 0.00          | 0.00             | 80.23            | 80.23             |
| Interest: Operating Capital              | 6.0 mons           | 0.00          | 0.00             | 23.02            | 23.02             |
| <b>Total VARIABLE COSTS</b>              |                    | <b>779.40</b> | <b>138.81</b>    | <b>187.93</b>    | <b>1,106.14</b>   |
| <u>FIXED COSTS</u>                       |                    |               |                  | <u>Unit</u>      | <u>Total</u>      |
| CASH Costs                               |                    |               |                  |                  |                   |
| Pickup Insurance                         |                    |               |                  | acre             | 31.97             |
| Property Taxes                           |                    |               |                  | acre             | 15.00             |
| <b>Total CASH Costs</b>                  |                    |               |                  |                  | <b>46.97</b>      |
| NON-CASH Costs                           |                    |               |                  |                  |                   |
| Machinery and Equip - Dep., Int., & Ins. |                    |               |                  | acre             | 2.14              |
| Pickup - Depreciation & Interest         |                    |               |                  | acre             | 96.60             |
| Shop                                     |                    |               |                  | acre             | 177.68            |
| Land Interest Charge                     |                    |               |                  | acre             | 400.00            |
| Interest on Establishment Costs          |                    |               |                  | acre             | 406.25            |
| <b>Total NON-CASH Costs</b>              |                    |               |                  |                  | <b>1,082.67</b>   |
| <b>Total FIXED COSTS</b>                 |                    |               |                  |                  | <b>1,129.65</b>   |
| <b>Total of All Costs Per Acre</b>       |                    |               |                  |                  | <b>(2,235.78)</b> |



Table 10. Douglas-Fir Christmas Tree Production, Year 4, Economic Costs and Returns, \$/Acre

| <u>VARIABLE CASH COSTS</u>               | <u>Description</u> | <u>Labor</u>  | <u>Machinery</u> | <u>Materials</u>   | <u>Total</u>        |
|--|--------------------|---------------|------------------|--------------------|---------------------|
| IPM Scouting                             | 0.5 hours          | 7.00          | 0.00             | 0.00               | 7.00                |
| Foliar Testing                           |                    | 0.00          | 0.00             | 5.00               | 5.00                |
| Fertilizer Appl. with Spreader           | 1.0 appl.          | 4.67          | 5.05             | 200.00             | 209.71              |
| Spot Spray, Herbicide                    | 1.6 hour           | 22.40         | 2.14             | 8.25               | 32.79               |
| Spray, Fungicide                         | 1.0 appl.          | 4.67          | 7.27             | \$25.00            | 36.94               |
| Spray, Insecticide                       | 1.0 appl.          | 4.67          | 7.27             | \$20.00            | 31.94               |
| Shearing                                 |                    | 525.00        | 0.00             | 0.00               | 525.00              |
| Pickup                                   |                    | 0.00          | 136.67           | 0.00               | 136.67              |
| Shop                                     |                    | 0.00          | 0.00             | 71.43              | 71.43               |
| Miscellaneous and Overhead               |                    | 0.00          | 0.00             | 84.52              | 84.52               |
| Interest: Operating Capital              | 6.0 mons           | 0.00          | 0.00             | 24.25              | 24.25               |
| <b>Total VARIABLE COSTS</b>              |                    | <b>568.40</b> | <b>158.40</b>    | <b>438.44</b>      | <b>1,165.25</b>     |
| <b><u>FIXED COSTS</u></b>                |                    |               |                  | <b><u>Unit</u></b> | <b><u>Total</u></b> |
| <b>CASH Costs</b>                        |                    |               |                  |                    |                     |
| Pickup Insurance                         |                    |               |                  | acre               | 31.97               |
| Property Taxes                           |                    |               |                  | acre               | 15.00               |
| <b>Total CASH Costs</b>                  |                    |               |                  |                    | <b>46.97</b>        |
| <b>NON-CASH Costs</b>                    |                    |               |                  |                    |                     |
| Machinery and Equip - Dep., Int., & Ins. |                    |               |                  | acre               | 39.68               |
| Pickup - Depreciation & Interest         |                    |               |                  | acre               | 96.60               |
| Shop                                     |                    |               |                  | acre               | 177.68              |
| Land Interest Charge                     |                    |               |                  | acre               | 400.00              |
| Interest on Establishment Costs          |                    |               |                  | acre               | 629.83              |
| <b>Total NON-CASH Costs</b>              |                    |               |                  |                    | <b>1,343.79</b>     |
| <b>Total FIXED COSTS</b>                 |                    |               |                  |                    | <b>1,390.76</b>     |
| <b>Total of All Costs Per Acre</b>       |                    |               |                  |                    | <b>(2,556.01)</b>   |

Table 11. Douglas-Fir Christmas Tree Production, Year 5, Economic Costs and Returns, \$/Acre

| <u>GROSS INCOME</u>                              |           | <u>Quantity</u>    | <u>Unit</u>  | <u>\$/Unit</u>   | <u>Total</u>      | <u>Price / Tree*</u> |                   |
|--|-----------|--------------------|--------------|------------------|-------------------|----------------------|-------------------|
| Douglas-Fir Christmas Trees, Grade #1            |           | 150                | Trees        | 10.29            | 1,543.50          | 10.29                |                   |
| Total GROSS Income                               |           | 150                |              |                  | 1,543.50          | 10.29                |                   |
| <u>VARIABLE CASH COSTS</u>                       |           | <u>Description</u> | <u>Labor</u> | <u>Machinery</u> | <u>Materials</u>  | <u>Total</u>         | <u>Cost/Tree*</u> |
| IPM Scouting                                     | 0.5 hours |                    | 7.00         | 0.00             | 0.00              | 7.00                 | 0.05              |
| Foliar Testing                                   |           |                    | 0.00         | 0.00             | 5.00              | 5.00                 | 0.03              |
| Fertilizer Appl. with Spreader                   | 1.0 appl. |                    | 4.67         | 5.05             | 200.00            | 209.71               | 1.40              |
| Spot Spray, Herbicide                            | 1.6 hour  |                    | 22.40        | 2.14             | 8.25              | 32.79                | 0.22              |
| Spray, Fungicide                                 | 1.0 appl. |                    | 4.67         | 7.27             | \$25.00           | 36.94                | 0.25              |
| Spray, Insecticide                               | 1.0 appl. |                    | 4.67         | 7.27             | \$20.00           | 31.94                | 0.21              |
| Shearing   |           |                    | 675.00       | 0.00             | 0.00              | 675.00               | 4.50              |
| Tagging  |           |                    | 45.00        | 0.00             | 0.00              | 45.00                | 0.30              |
| Cut Trees  |           |                    | 60.00        | 0.00             | 0.00              | 60.00                | 0.40              |
| Shagging   |           |                    | 112.50       | 0.00             | 0.00              | 112.50               | 0.75              |
| Baling   |           |                    | 127.50       | 18.08            | 0.00              | 145.58               | 0.97              |
| Loading  |           |                    | 97.50        | 12.05            | 0.00              | 109.55               | 0.73              |
| Pickup   |           |                    | 0.00         | 136.67           | 0.00              | 136.67               | 0.91              |
| Shop   |           |                    | 0.00         | 0.00             | 71.43             | 71.43                | 0.48              |
| Miscellaneous and Overhead                       |           |                    | 0.00         | 0.00             | 134.33            | 134.33               | 0.90              |
| Interest: Operating Capital                      | 6.0 mons  |                    | 0.00         | 0.00             | 38.54             | 38.54                | 0.26              |
| Total VARIABLE COSTS                             |           |                    | 1,160.90     | 188.54           | 502.54            | 1,851.98             | 12.35             |
| <u>FIXED COSTS</u>                               |           |                    |              | <u>Unit</u>      | <u>Total</u>      | <u>Cost/Tree*</u>    |                   |
| CASH Costs                                       |           |                    |              |                  |                   |                      |                   |
| Pickup Insurance                                 |           |                    |              | acre             | 31.97             | 0.21                 |                   |
| Property Taxes                                   |           |                    |              | acre             | 15.00             | 0.10                 |                   |
| Total CASH Costs                                 |           |                    |              |                  | 46.97             | 0.31                 |                   |
| GROSS INCOME minus VARIABLE AND FIXED CASH COSTS |           |                    |              |                  | (355.45)          | (2.37)               |                   |
| NON-CASH Costs                                   |           |                    |              |                  |                   |                      |                   |
| Machinery and Equip - Dep., Int., & Ins.         |           |                    |              | acre             | 39.68             | 0.26                 |                   |
| Pickup - Depreciation & Interest                 |           |                    |              | acre             | 96.60             | 0.64                 |                   |
| Shop   |           |                    |              | acre             | 177.68            | 1.18                 |                   |
| Land Interest Charge                             |           |                    |              | acre             | 400.00            | 2.67                 |                   |
| Interest on Establishment Costs                  |           |                    |              | acre             | 885.43            | 5.90                 |                   |
| Total NON-CASH Costs                             |           |                    |              |                  | 1,599.39          | 10.66                |                   |
| Total FIXED COSTS                                |           |                    |              |                  | 1,646.36          | 10.98                |                   |
| Total of All Costs Per Acre                      |           |                    |              |                  | 3,498.34          | 23.32                |                   |
| <b>Net Projected Returns</b>                     |           |                    |              |                  | <b>(1,954.84)</b> | <b>(13.03)</b>       |                   |

\* Based on trees harvested

Table 12. Douglas-Fir Christmas Tree Production, Year 6, Economic Costs and Returns, \$/Acre

| <u>GROSS INCOME</u>                              |                    | <u>Quantity</u> | <u>Unit</u>      | <u>\$/Unit</u>   | <u>Total</u> | <u>Price / Tree*</u> |
|--|--------------------|-----------------|------------------|------------------|--------------|----------------------|
| Douglas-Fir Christmas Trees, Grade #1            |                    | 600             | Trees            | 10.29            | 6,174.00     | 10.29                |
| Douglas-Fir Christmas Trees, Grade #2            |                    | 300             | Trees            | 7.72             | 2,315.25     | 7.72                 |
| Total GROSS Income                               |                    | 900             |                  |                  | 8,489.25     | 9.43                 |
| <u>VARIABLE CASH COSTS</u>                       | <u>Description</u> | <u>Labor</u>    | <u>Machinery</u> | <u>Materials</u> | <u>Total</u> | <u>Cost/Tree*</u>    |
| IPM Scouting                                     | 0.5 hours          | 7.00            | 0.00             | 0.00             | 7.00         | 0.01                 |
| Foliar Testing                                   |                    | 0.00            | 0.00             | 5.00             | 5.00         | 0.01                 |
| Fertilizer Appl. with Spreader                   | 1.0 appl.          | 4.67            | 5.05             | 200.00           | 209.71       | 0.23                 |
| Spot Spray, Herbicide                            | 1.6 hour           | 22.40           | 2.14             | 8.25             | 32.79        | 0.04                 |
| Spray, Fungicide                                 | 1.0 appl.          | 4.67            | 7.27             | \$25.00          | 36.94        | 0.12                 |
| Spray, Insecticide                               | 1.0 appl.          | 4.67            | 7.27             | \$20.00          | 31.94        | 0.11                 |
| Shearing   |                    | 675.00          | 0.00             | 0.00             | 675.00       | 0.75                 |
| Tagging  |                    | 270.00          | 0.00             | 0.00             | 270.00       | 0.30                 |
| Cut Trees  |                    | 360.00          | 0.00             | 0.00             | 360.00       | 0.40                 |
| Shagging   |                    | 675.00          | 0.00             | 0.00             | 675.00       | 0.75                 |
| Baling   |                    | 765.00          | 18.08            | 0.00             | 783.08       | 0.87                 |
| Loading  |                    | 585.00          | 12.05            | 0.00             | 597.05       | 0.66                 |
| Pickup   |                    | 0.00            | 136.67           | 0.00             | 136.67       | 0.15                 |
| Shop   |                    | 0.00            | 0.00             | 71.43            | 71.43        | 0.08                 |
| Miscellaneous and Overhead                       |                    | 0.00            | 0.00             | 311.33           | 311.33       | 0.35                 |
| Interest: Operating Capital                      | 6.0 mons           | 0.00            | 0.00             | 89.31            | 89.31        | 0.10                 |
| Total VARIABLE COSTS                             |                    | 3,373.40        | 188.54           | 730.32           | 4,292.26     | 4.77                 |
| <u>FIXED COSTS</u>                               |                    |                 |                  | <u>Unit</u>      | <u>Total</u> | <u>Cost/Tree*</u>    |
| CASH Costs                                       |                    |                 |                  |                  |              |                      |
| Pickup Insurance                                 |                    |                 |                  | acre             | 31.97        | 0.04                 |
| Property Taxes                                   |                    |                 |                  | acre             | 15.00        | 0.02                 |
| Total CASH Costs                                 |                    |                 |                  |                  | 46.97        | 0.05                 |
| GROSS INCOME minus VARIABLE AND FIXED CASH COSTS |                    |                 |                  |                  | 4,150.02     | 4.61                 |
| NON-CASH Costs                                   |                    |                 |                  |                  |              |                      |
| Machinery and Equip - Dep., Int., & Ins.         |                    |                 |                  | acre             | 39.68        | 0.04                 |
| Pickup - Depreciation & Interest                 |                    |                 |                  | acre             | 96.60        | 0.11                 |
| Shop   |                    |                 |                  | acre             | 177.68       | 0.20                 |
| Land Interest Charge                             |                    |                 |                  | acre             | 400.00       | 0.44                 |
| Interest on Establishment Costs                  |                    |                 |                  | acre             | 1,080.91     | 1.20                 |
| Total NON-CASH Costs                             |                    |                 |                  |                  | 1,794.88     | 1.99                 |
| Total FIXED COSTS                                |                    |                 |                  |                  | 1,841.85     | 2.05                 |
| Total of All Costs Per Acre                      |                    |                 |                  |                  | 6,134.11     | 6.82                 |
| <b>Net Projected Returns</b>                     |                    |                 |                  |                  | 2,355.14     | 2.62                 |

\* Based on trees harvested

Table 13. Douglas-Fir Christmas Tree Production, Year 7, Economic Costs and Returns, \$/Acre

| <u>GROSS INCOME</u>                              |                    | <u>Quantity</u> | <u>Unit</u>      | <u>\$/Unit</u>   | <u>Total</u>    | <u>Price/Tree*</u> |
|--|--------------------|-----------------|------------------|------------------|-----------------|--------------------|
| Douglas-Fir Christmas Trees, Grade #1            |                    | 200             | Trees            | 10.29            | 2,058.00        | 10.29              |
| Douglas-Fir Christmas Trees, Grade #2            |                    | 100             | Trees            | 7.72             | 771.75          | 7.72               |
| Total GROSS Income                               |                    | 300             |                  |                  | 2,829.75        | 9.43               |
| <u>VARIABLE CASH COSTS</u>                       | <u>Description</u> | <u>Labor</u>    | <u>Machinery</u> | <u>Materials</u> | <u>Total</u>    | <u>Cost/Tree*</u>  |
| IPM Scouting                                     | 0.5 hours          | 7.00            | 0.00             | 0.00             | 7.00            | 0.02               |
| Foliar Testing                                   |                    | 0.00            | 0.00             | 5.00             | 5.00            | 0.02               |
| Fertilizer Appl. by Hand                         | 1.0 hours          | 14.00           | 0.00             | 50.00            | 64.00           | 0.21               |
| Spot Spray, Herbicide                            | 1.6 hour           | 22.40           | 2.14             | 8.25             | 32.79           | 0.11               |
| Shearing   |                    | 247.50          | 0.00             | 0.00             | 247.50          | 0.83               |
| Tagging  |                    | 90.00           | 0.00             | 0.00             | 90.00           | 0.30               |
| Cut Trees  |                    | 120.00          | 0.00             | 0.00             | 120.00          | 0.40               |
| Shagging   |                    | 225.00          | 0.00             | 0.00             | 225.00          | 0.75               |
| Baling   |                    | 255.00          | 18.08            | 0.00             | 273.08          | 0.91               |
| Loading  |                    | 195.00          | 12.05            | 0.00             | 207.05          | 0.69               |
| Pickup   |                    | 0.00            | 136.67           | 0.00             | 136.67          | 0.46               |
| Shop   |                    | 0.00            | 0.00             | 71.43            | 71.43           | 0.24               |
| Miscellaneous and Overhead                       |                    | 0.00            | 0.00             | 118.36           | 118.36          | 0.39               |
| Interest: Operating Capital                      | 6.0 mons           | 0.00            | 0.00             | 33.96            | 33.96           | 0.11               |
| Total VARIABLE COSTS                             |                    | 1,175.90        | 168.94           | 287.00           | 1,631.84        | 5.44               |
| <u>FIXED COSTS</u>                               |                    |                 |                  | <u>Unit</u>      | <u>Total</u>    | <u>Cost/Tree*</u>  |
| CASH Costs                                       |                    |                 |                  |                  |                 |                    |
| Pickup Insurance                                 |                    |                 |                  | acre             | 31.97           | 0.11               |
| Property Taxes                                   |                    |                 |                  | acre             | 15.00           | 0.05               |
| Total CASH Costs                                 |                    |                 |                  |                  | 46.97           | 0.16               |
| GROSS INCOME minus VARIABLE AND FIXED CASH COSTS |                    |                 |                  |                  | 1,150.94        | 3.84               |
| NON-CASH Costs                                   |                    |                 |                  |                  |                 |                    |
| Machinery and Equip - Dep., Int., & Ins.         |                    |                 |                  | acre             | \$2.78          | 0.01               |
| Pickup - Depreciation & Interest                 |                    |                 |                  | acre             | 96.60           | 0.32               |
| Shop   |                    |                 |                  | acre             | 177.68          | 0.59               |
| Land Interest Charge                             |                    |                 |                  | acre             | 400.00          | 1.33               |
| Interest on Establishment Costs                  |                    |                 |                  | acre             | 845.40          | 2.82               |
| Total NON-CASH Costs                             |                    |                 |                  |                  | 1,522.46        | 5.07               |
| Total FIXED COSTS                                |                    |                 |                  |                  | 1,569.43        | 5.23               |
| Total of All Costs Per Acre                      |                    |                 |                  |                  | 3,201.27        | 10.67              |
| <b>Net Projected Returns</b>                     |                    |                 |                  |                  | <b>(371.52)</b> | <b>(1.24)</b>      |

\* Based on trees harvested