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Scotch pine Christmas trees

1991 production costs in northern Idaho

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This budget shows typical costs of producing Scotch pine Christmas trees in northern Idaho. It is based on typical cultural practices; individual operations differ depending on management style and horticultural practices. The authors greatly appreciate the technical assistance provided by northern Idaho Christmas tree growers.

The model plantation

The model farm includes 100 total acres with 20 acres in Scotch pine Christmas trees. Ten percent of the Christmas tree acreage is dedicated to access roads. Two budgets were estimated at different tree spacings. Table 1 shows the number of trees planted and harvested each year. The initial year, year 0, accounts for land preparation before planting; years 1, 2, and 3 are the planting years; years 4 and 5 are the growing years; years 6 through 9 are the harvest years.

Machinery and equipment

Machinery and equipment used in this budget are typical for a 100-acre farm growing Christmas trees in northern Idaho. Table 2 describes this machinery; the costs were generated using information from the American Society of Agricultural Engineers. The values assumed on all the machinery and equipment reflect 1991 prices. The pickup has an estimated 15 percent of its use allocated to Christmas trees. The remaining time is used for other farm production chores and household use.

Resources

This budget assumes all land is owned by the plantation operator and was used for dryland grazing before Christmas tree production. Property taxes are \$6.25 per acre. Most labor is custom hired, including

planting, staking, handling, shearing, tagging, etc.; few labor hours are actually performed by the owner. Labor supplied by the owner or family members is estimated at a noncash cost of \$7.00 per hour. Operations not typically performed by the operator are budgeted at custom rate. Annual quarterly labor requirements for a Scotch pine Christmas tree operation appear in Table 3.

Chemical applications appear in Table 4. Please consult an Extension agricultural agent for recommended practices and applications regarding your particular operation.

Establishment costs

The cost of establishing a Christmas tree stand should be spread over the harvest years. This is done by carrying forward with interest the total establishment costs for the initial or prep year, the planting or establishment years, and the growing years. The total establishment costs for years 0 through 5 are amortized over the harvest life of the Christmas tree operation (10.5 percent for 4 years). Prorated establishment costs are identified under fixed costs in the budgets for years 6 through 9.

Budgets

Several types of costs appear in the budgets (Tables 5 through 10). The two largest categories are variable and fixed costs. Variable costs are those that vary with the amount of input; examples are seed, fertilizer, chemicals, fuel, repairs, custom labor, and interest on operating capital. Fixed costs stay the same no matter how much (if anything) is produced; examples are depreciation, taxes, insurance, and interest.

Another distinction is made between cash and noncash costs. Cash costs require payment; that is,

they are out-of-pocket expenses that must be paid outright. They can be variable like fuel or fixed like property taxes. Noncash costs do not necessarily need an immediate cash payment. For example, when the owner provides labor, cash needn't be spent, so it is a noncash payment, but if the owner hires labor for that operation, then the labor payment becomes a cash cost.

Stumpage costs are attributed to the last harvest year. See Table 1 for the percentage of trees harvested each year. Tables 5, 6, and 7 give costs for planting, growing, and harvesting years for 1,100 Scotch pines per acre (6-foot spacing). Tables 8, 9, and 10 give costs for planting, growing, and harvesting years for 1,568 Scotch pines (5-foot spacing).

Long-term, intermediate, and short-term capital are used in this budget to finance establishment costs, machinery, equipment, and operating inputs. Interest on operating capital is treated as a cash expense. The cost of capital is 10.5 percent, and it is assumed 100 percent of operating capital is borrowed.

General overhead is estimated at 5 percent of annual variable cash costs and includes items such as telephone, professional membership, education, advertising, and utilities. Hand tools, including six shearing knives, six sheaths, two sharpeners, six gloves, six leg guards, and disposable suits, are purchased on an annual basis at an average cost of \$30 per acre.

The breakeven price is the average cost per tree sold. It is calculated by dividing total costs per acre (variable plus fixed costs) by the total number of trees harvested.

For further reading

- CIS 528 Plant Your Container-grown Seedlings Right (35 cents)
- CIS 896 Christmas Tree Marketing (50 cents)
- CIS 948 Grand Fir Christmas Trees: 1991 Production Costs in Northern Idaho (50 cents)
- PNW 6 Growing Christmas Trees in the Pacific Northwest (75 cents)
- PNW 219 Weed Control in Christmas Trees (50 cents)
- PNW 226 Developing High Quality True Fir Christmas Trees (75 cents)
- PNW 227 Developing Sheared Douglas-fir Christmas Trees (75 cents)

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Pesticide residues: These recommendations for use are based on currently available labels for each pesticide listed. If followed carefully, residues should not exceed the established tolerances. To avoid excessive residues, follow label directions carefully with respect to rate, number of applications, and minimum interval between application and re-entry or harvest.

Groundwater: To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.

Trade names: To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

Table 1. Number of Scotch pine Christmas trees planted, maintained, and harvested on an annual basis.

1,100 trees: 6-foot spacing, 80% harvested			
Year	Number planted	Number replaced	Number harvested
1	1,100		
2		165 (15%)	
3		77 (7%)	
6			132 (15%)
7			440 (50%)
8			176 (20%)
9			132 (15%)
			880

1,568 trees: 5-foot spacing, 80% harvested			
Year	Number planted	Number replaced	Number harvested
1	1,568		
2		235 (15%)	
3		110 (7%)	
6			188 (15%)
7			627 (50%)
8			251 (20%)
9			188 (15%)
			1,254

Table 2. Estimated nonland investment in a northern Idaho Scotch pine Christmas tree plantation, 1991 prices.

Item	Size	Purchase price (\$)	Salvage value (%)	Annual use	Useful life
Tractor	20 hp	14,000	10	100 hr	12,000 hr
Boom sprayer	18 ft	2,000	10	45 hr	2,500 hr
Rotary tiller	4 ft	1,500	10	20 hr	2,500 hr
Pick-up	½ ton	14,000	10	1,200 mi	80,000 mi
Misc. equip.		378			12 yr
(spray mask, gopher probe, backpack sprayer)					

Table 3. Quarterly number of hours of labor per acre (excluding custom work) required for Scotch pine Christmas trees in northern Idaho.

	Quarter 2	Quarter 3	Quarter 4	Total
Year 0 (prep year)		4.0	0.8	4.8
Year 1 (planting)	3.8	1.5		5.3
Year 2 (planting)	3.8	1.2		5.0
Year 3 (planting)	5.0			5.0
Year 4 (growing)	5.4			5.4
Year 5 (growing)	5.0			5.0
Year 6 (harvest)	2.8	2.8		5.6
Year 7 (harvest)	5.1			5.1
Year 8 (harvest)	5.3			5.3
Year 9 (harvest)	5.1			5.1

Note: Quarter 1 has no required labor hours.

Table 4. Chemicals for Scotch pine Christmas tree plantation.

Chemical	Years of use
Herbicide (Roundup): spot spraying	each year
Surfactant and herbicide (2,4-D and 1-R-11):	year 1 only
Herbicide (Goal and Atrazine):	years 1, 2, then alternate years
Surfactant and insecticide (1-R-11 and Sevin):	each year except year 0
Fungicide (Bravo):	year 6 only

Table 5. Costs per acre for Scotch pine Christmas trees (1,100 trees per acre) in northern Idaho in prep year (year 0) and planting years (years 1-3).

	Year 0	Year 1	Year 2	Year 3
Variable costs	(\$)	(\$)	(\$)	(\$)
Disk (custom)	15.00	0	0	0
Harrow (custom)	7.50	0	0	0
Plow (custom)	25.00	0	0	0
Mark rows (custom)	0	10.00	0	0
Pesticide	30.39	65.84	61.80	0
Rodent control (custom)	15.00	0	15.00	0
Scotch pine seedlings (.15 each)	0	165.00	24.75	11.55
Plant trees (custom, .16 each)	0	176.00	26.40	12.32
Straighten and stake (custom)	0	0	110.00	110.00
Handles and shearing (custom)	0	0	0	99.00
Machinery and equipment				
Repair and maint., fuel	68.15	68.63	68.63	68.39
Labor	33.60	37.48	37.48	35.54
Interest on operating capital (10.5%)	8.12	46.24	32.41	33.92
Overhead (5% of variable cash costs)	17.76	26.59	16.95	16.76
Total variable costs	220.52	595.78	393.42	387.48
Fixed costs				
Machinery and equipment	115.17	123.97	123.97	119.57
Land	30.25	30.25	30.25	30.25
Total fixed costs	145.42	154.22	154.22	149.82
Total costs	365.94	750.00	547.64	537.30

Table 6. Costs per acre for Scotch pine Christmas trees (1,100 trees per acre) in northern Idaho in growing years (years 4-5).

	Year 4	Year 5
Variable costs	(\$)	(\$)
Pesticide	61.80	31.51
Rodent control (custom)	15.00	0
Shearing (custom)	99.00	99.00
Machinery and equipment		
Repair and maintenance, fuel	68.63	68.39
Labor	37.48	35.54
Interest on operating capital (10.5%)	28.10	25.48
Overhead (5% of variable cash costs)	13.63	11.22
Total variable costs	323.64	271.14
Fixed costs		
Machinery and equipment	123.97	119.57
Land	30.25	30.25
Total fixed costs	154.22	149.82
Total costs	477.86	420.96

Table 7. Costs per acre for Scotch pine Christmas trees (1,100 trees per acre) in northern Idaho in harvest years (years 6-9).

	Year 6	Year 7	Year 8	Year 9
Variable costs	(\$)	(\$)	(\$)	(\$)
Pesticide	74.24	31.51	61.80	31.51
Rodent control (custom)	15.00	0	15.00	0
Shearing (custom)	99.00	87.12	47.52	31.68
Tag trees (custom)	6.60	22.00	8.80	6.60
Cut, yard, and bale (custom)	231.00	770.00	308.00	231.00
Machinery and equipment				
Repair and maint., fuel	68.86	68.39	68.63	68.39
Labor	39.42	35.54	37.48	35.54
Stumpage (custom)	0	0	0	130.00
Interest on operating capital (10.5%)	30.82	33.00	28.04	24.71
Overhead (5% of variable cash costs)	26.28	50.60	26.89	26.19
Total variable costs	591.22	1,098.16	602.16	585.62
Fixed costs				
Establishment ¹	1,226.00	1,226.00	1,226.00	1,226.00
Machinery and equipment	128.97	119.57	123.97	119.57
Land	30.25	30.25	30.25	30.25
Total fixed costs	1,384.62	1,375.82	1,380.22	1,375.82
Total costs	1,975.84	2,473.98	1,982.38	1,961.44
Number of trees harvested	132	440	176	132
Annual breakeven price per harvested tree	14.97	5.62	11.26	14.86
Average breakeven price for all trees harvested: \$9.54				

¹Includes amortization of establishment costs and growing costs over 14 years of harvest.

Table 8. Costs per acre for Scotch pine Christmas trees (1,568 trees per acre) in northern Idaho in prep year (year 0) and planting years (years 1-3).

	Year 0	Year 1	Year 2	Year 3
Variable costs	(\$)	(\$)	(\$)	(\$)
Disk (custom)	15.00	0	0	0
Harrow (custom)	7.50	0	0	0
Plow (custom)	25.00	0	0	0
Mark rows (custom)	0	10.00	0	0
Pesticide	30.39	65.84	61.80	0
Rodent control (custom)	15.00	0	15.00	0
Scotch pine seedlings (.15 each)	0	235.20	24.75	16.50
Plant trees (custom, .16 each)	0	250.88	37.60	17.60
Straighten and stake (custom)	0	0	156.80	156.80
Handles (custom)	0	0	0	141.12
Machinery and equipment				
Repair and maint., fuel	68.15	68.63	68.63	68.39
Labor	33.60	37.48	37.48	35.54
Interest on operating capital (10.5%)	8.12	56.38	36.06	40.08
Overhead (5% of variable cash costs)	17.76	34.35	20.03	22.02
Total variable costs	220.52	758.76	458.15	498.05
Fixed costs				
Machinery and equipment	115.17	123.97	123.97	119.57
Land	30.25	30.25	30.25	30.25
Total fixed costs	145.42	154.22	154.22	149.82
Total costs	365.94	912.98	612.37	647.87

Table 9. Costs per acre for Scotch pine Christmas trees (1,568 trees per acre) in northern Idaho in growing years (years 4-5).

	Year 4	Year 5
Variable costs	(\$)	(\$)
Pesticide	61.80	31.51
Rodent control	15.00	0
Shearing	141.12	141.12
Machinery and equipment		
Repair and maintenance, fuel	68.63	68.39
Labor	37.48	35.54
Interest on operating capital (10.5%)	30.66	28.06
Overhead (5% of variable cash costs)	15.86	13.45
Total variable costs	370.55	318.07
Fixed costs		
Machinery and equipment	123.97	119.57
Land	30.25	30.25
Total fixed costs	154.22	149.82
Total costs	524.77	467.89

Table 10. Costs per acre for Scotch pine Christmas trees (1,568 trees per acre) in northern Idaho in harvest years (years 6-9).

	Year 6	Year 7	Year 8	Year 9
Variable costs	(\$)	(\$)	(\$)	(\$)
Pesticide	74.24	31.51	61.80	31.51
Rodent control (custom)	15.00	0	15.00	0
Shearing (custom)	141.12	124.19	67.77	45.18
Tag trees (custom)	9.40	31.35	12.55	9.44
Cut, yard, and bale (custom)	329.00	1,097.25	439.25	329.00
Machinery and equipment				
Repair and maint., fuel	68.86	68.39	68.63	68.39
Labor	39.42	35.54	37.48	35.54
Stumpage (custom)	0	0	0	130.00
Interest on operating capital (10.5%)	34.42	38.76	30.57	26.51
Overhead (5% of variable cash costs)	33.60	69.57	34.78	32.00
Total variable costs	745.06	1,496.56	767.83	707.53
Fixed costs				
Establishment ¹	1,393.00	1,393.00	1,393.00	1,393.00
Machinery and equipment	128.37	119.57	123.97	119.57
Land	30.25	30.25	30.25	30.25
Total fixed costs	1,551.62	1,542.82	1,547.22	1,542.82
Total costs	2,296.68	3,039.38	2,316.05	2,250.35
Number of trees harvested	188	627	251	188
Annual breakeven price per harvested tree	12.22	4.85	9.22	11.97
Average breakeven price for all trees harvested: \$7.90				

¹Includes amortization of establishment costs and growing costs over 14 years of harvest.

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