

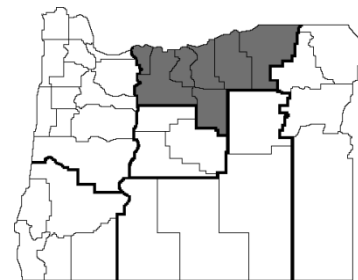
Enterprise Budget

Apples, Medium Density, North Central Region

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This enterprise budget estimates the typical per-acre costs associated with medium density apple production in Hood River County. It should be used as a guide to estimate actual costs and is not representative of any particular farm. The major assumptions used in constructing this budget are discussed below. An attempt has been made to report typical cultural practices used in medium density apple production; however, this does not represent the only production method. Assistance provided by area producers and agribusinesses is greatly appreciated.

Typical Farm

The typical farm in Hood River County, as used in this budget, consists of 70 total productive acres. Bearing acres include 30 acres of winter pears, 12 acres of fresh market Bartlett pears, 8 acres of medium density pears, 5 acres of medium density apples, 5 acres of high density sweet cherries or wine grapes, and approximately 15 percent, or 10 acres, of the orchard under establishment. It is assumed that this farm complies with Best Management Practices (BMP).

Land and Irrigation

This budget is based on 5 producing acres of medium density apples, with 558 trees per acre. The trees are young, ranging in age from 10 to 25 years, with establishment costs amortized over a 25-year period. Average production is 50 bins per acre at a gross price to the grower of \$250 per bin. Each bin weighs 850 pounds. The land is owned and valued at \$8,000 per acre, with \$60 per acre property taxes. This medium density apple orchard is irrigated with a micro-irrigation system valued at \$1,200 per acre.

Labor and Housing

General labor is hired at a rate of \$11.50 per hour, tractor drivers paid \$13 per hour, and harvest labor costs \$21.50 per bin, all of which include worker's compensation, unemployment insurance, and other labor overhead expenses. Housing for summer labor is valued at \$120,000 and has a productive life of 30 years. This unit houses 10 people. Foreman housing is also provided year-round at no cost to the employee and is valued at \$600 per month. The foreman housing is treated as a non-cash opportunity cost to the owner. All

labor and foreman housing charges are split equally across the 70 acres.

Capital

Interest on operating capital (5 percent) is treated as a cash expense. One-half of the cash expenses are borrowed for a 6 month period. Interest on intermediate (6 percent) and long term capital (4 percent) is treated as a non-cash opportunity cost to the owner.

Machinery and Equipment

The machinery and equipment used in the budget reflect the typical machinery complement of a 70-acre orchard in Hood River County. A detailed breakdown of machinery values is shown in Table 1. Estimated machinery costs are shown in Table 2. The machinery costs are estimated based on the total farm use of the machinery. Gasoline and diesel costs \$4.00 per gallon. Propane costs \$2.25 per gallon. Table 3 shows the per acre labor, variable, and fixed costs for certain machinery operations in the orchard.

Operations

The cultural operations are listed approximately in the order in which they are performed. A 70-hp tractor is used for shredding brush, flailing, and pulling the air-blast sprayer; it's also used during harvest. A 50-hp tractor is used to auger holes for new trees, spread fertilizer, pull an older air-blast sprayer, apply gopher bait, and assist during harvest. The 35-hp tractor is used to spray weeds, assist in harvest, and as a general utility tractor. A forklift is leased during harvest for three months to load bins in the field onto trucks. Herbicides are applied to 30 percent of each acre as strips between trees.

Break even Analysis

Tables 4 and 5 show the returns per acre for cash and total costs at various yields and prices. These returns do reflect the changes in harvesting costs with changes in yield. Refer to footnote below tables for interpretation of table contents.

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Apples, Medium-Density, 2011 \$/acre economic costs and returns.

Apples, Medium-Density, 2011 \$/acre economic costs and returns.								
GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	Your Income	
Apples		50.00	bins	250.00	<u>12,500.00</u>	<u>250.00</u>		
Total gross income					12,500.00	250.00		
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin	Your Costs
Pruning and training		60.0 hours	\$690.00	\$0.00	\$0.00	\$690.00	\$13.80	
Thinning		50.0 hours	575.00	0.00	0.00	575.00	11.50	
Tree removal & tree replacement		2.5 hours	61.25	26.44	16.00	103.69	2.07	
Raking and shredding brush		1.0 x/acre	9.70	9.74	0.00	19.45	0.39	
Fertilizer and lime - custom applied		2.0 applications	1.96	3.49	165.00	170.46	3.41	
Herbicide strip maintenance (.30x)		2.0 applications	16.00	9.68	60.00	85.68	1.71	
Insecticides and fungicides		10.0 applications	54.99	92.82	570.00	717.81	14.36	
Pheromone disruption (1/2 rate)		2.5 hours	28.75	0.00	200.00	228.75	4.58	
Production mgmt consultant fees		1.0 x/acre	0.00	0.00	30.00	30.00	0.60	
Bee rental		2.0 hives	0.00	0.00	100.00	100.00	2.00	
Flailing/mowing orchard floor		5.0 times	16.17	21.42	0.00	37.60	0.75	
Rodent control		1.0 hours	4.12	3.51	20.00	27.63	0.55	
Frost protection		2.0 hour	23.00	98.33	0.00	121.33	2.43	
Irrigation		5.0 hours	57.50	0.00	12.00	69.50	1.39	
Trellis System		1.0 x/acre	0.00	0.00	18.00	18.00	0.36	
Ladders, pruning, & picking equip.		1.0 x/acre	0.00	16.01	0.00	16.01	0.32	
Harvesting costs		50.0 bins	1,211.43	95.41	0.00	1,306.85	26.14	
Supervisory Labor		12.5 hours						
Tractor drivers		5.2 hours						
Pickup, truck & ATV		1.0 x/acre	0.00	189.49	0.00	189.49	3.79	
Housing facilities		1.0 x/acre	0.00	0.00	45.43	45.43	0.91	
Miscellaneous and overhead		1.0 x/acre	0.00	0.00	75.00	75.00	1.50	
Interest: operating capital		6.0 months	<u>0.00</u>	<u>0.00</u>	<u>57.85</u>	<u>57.85</u>	<u>1.16</u>	
Total variable costs			2,749.89	566.35	1,369.27	4,685.51	93.71	
FIXED CASH COSTS				Unit	Total	Cost/bin	Your Costs	
Pickup, truck & ATV insurance				acre	34.19	0.68		
Water assessment				acre	60.00	1.20		
Property insurance				acre	25.00	0.50		
Property taxes				acre	<u>60.00</u>	<u>1.20</u>		
Total fixed cash costs					179.19	3.58		
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	Your Costs	
Machinery and equipment insurance, depreciation & interest				acre	481.83	9.64		
Pickup, truck & ATV - depreciation & interest				acre	89.14	1.78		
Foreman housing				acre	102.86	2.06		
Housing facilities				acre	91.43	1.83		
Land interest charge				acre	320.00	6.40		
Amortized establishment costs*				acre	<u>2,036.09</u>	<u>40.72</u>		
Total fixed non-cash costs					3,121.34	62.43		
Total fixed costs					3,300.53	66.01		
Total of all costs per acre					\$7,986.05	\$159.72		
Net projected returns					\$4,513.95	\$90.28		

*Based on "Orchard Economics: The Cost of Establishing and Producing Medium-Density Apples in the Hood River Valley", AEB 0028, Revised March, 2012.

Table 1. Machinery Cost Assumptions.

Machine	Size or description	Market value	Hours or miles of annual use	Expected life (years)	Salvage Value
Tractor	4 wheel dr 70hp, new	\$ 33,000	469	10	\$ 9,748
Tractor	2 wheel dr 50hp, old	18,000	157	20	2,310
Tractor	2 wheel dr 35 hp, old	7,500	161	20	962
Forklift (Leased during harvest)	3 months @ \$1,200/mon	NA	480	NA	NA
Air-blast sprayer	400 gallon unit, PTO, new	17,500	125	10	3,095
Air-blast sprayer	400 gallon unit, PTO, older	5,000	84	10	884
Flail chopper	8' unit	6,000	160	7	1,531
Weed sprayer	100 gallon unit	2,000	61	15	192
Fertilizer spreader		2,300	17	20	120
Brush windrow		3,500	25	20	182
Gopher machine		1,200	16	20	63
Pickup	1/2 ton 4x4, new	35,000	12,000	10	13,235
Truck	2 ton, used	18,000	3,500	20	2,710
Gator	4 wheel, new	8,000	3,000	5	3,585
Auger		1,700	35	20	89
Front-end loader & backforks		5,800	64	10	1,026
Bin trailer		7,500	64	10	1,326
Ladders	35 units	6,125	N/A	10	N/A
Picking bags	35 units	1,500	N/A	2	N/A
Picking buckets for wine grapes		500	N/A	5	N/A
Chain & pruning saws	3 units each, 1-loppers	3,000	N/A	3	N/A
Irrigation system ¹	Micro, per acre	1,200	N/A	25	N/A
Wind machine	2 units, propane	56,000	70	25	1,585
Smudge Pots	8 units, per acre	17,920	70	10	3,169
Trellis system ¹	Three-wire vertical, per acre	1,800	N/A	25	N/A
Housing facilities	1 unit	120,000	N/A	30	0

¹Included in costs are all materials and labor to install system.

Table 2. Machinery Cost Calculations.

Machine	Size or description	--- Variable costs ---			----- Fixed costs -----		Total cost
		Fuel & Lube	Repairs & Maint.	Depr. & Interest	Insurance		
				----- Costs per hour -----			
Tractor	4 wheel dr 70hp, new	\$13.80	\$0.46	\$7.70	\$0.41	\$22.37	
Tractor	2 wheel dr 50hp, old	10.12	0.40	\$8.86	0.58	19.96	
Tractor	2 wheel dr 35 hp, old	6.90	0.17	3.60	0.24	10.90	
Forklift (Leased during harvest)	3 months @ \$1,200/mon	8.00	0.00	0.00	0.00	8.00	
Air-blast sprayer	400 gallon unit, PTO, new	0.00	7.68	16.42	0.49	24.59	
Air-blast sprayer	400 gallon unit, PTO, older	0.00	1.94	7.04	0.21	9.19	
Flail chopper	8' unit	0.00	2.95	5.41	0.14	8.50	
Weed sprayer	100 gallon unit	0.00	0.80	3.03	0.11	3.94	
Fertilizer spreader		0.00	1.04	10.94	0.44	12.42	
Brush windrow		0.00	0.45	11.13	0.44	12.03	
Gopher machine		0.00	0.54	5.99	0.24	6.76	
				----- Costs per mile -----			
Pickup	1/2 ton 4x4, new	\$0.38	\$0.05	\$0.30	\$0.12	\$0.85	
Truck	2 ton, used	0.77	0.57	0.40	0.27	2.00	
ATV	4 wheeler, new	1.10	0.02	0.41	0.02	1.55	
				----- Costs per acre -----			
Auger		\$0.00	\$0.15	\$1.92	\$0.00	\$2.06	
Front-end loader & backforks		0.00	\$2.89	10.66	0.00	13.55	
Bin trailer		0.00	\$3.74	13.78	0.00	17.52	
Ladders	35 units	0.00	5.25	11.38	0.00	16.63	
Picking bags	35 units	0.00	1.29	11.35	0.00	12.64	
Picking buckets for wine grapes		0.00	0.43	4.60	0.00	5.03	
Chain & pruning saws	3 units each, 1-loppers	6.90	2.57	15.57	0.00	25.04	
Irrigation system	Micro, per acre	0.00	12.00	84.00	0.00	96.00	
Wind machines	2 units, propane	62.10	15.67	55.77	0.00	133.54	
Smudge Pots	7 units, per acre	18.00	2.56	0.00	0.00	20.56	
Trellis system - apples	Three-wire vertical, per acre	0.00	18.00	126.00	0.00	144.00	
Housing facilities	1 unit	0.00	45.43	91.43	0.00	136.86	

Table 3. Estimated Cost of Each Operation with Power Unit for a 13' Between-Row Spacing.

Operation	Tractor	per hour	Acres per hour	-- Machine costs --			Total cost per acre
				Labor cost per acre	Variable cost per acre	Fixed cost per acre	
Air-blast sprayer	4 wheel dr 70hp	2.00	2.36	\$5.50	\$9.28	\$10.58	\$25.37
Flail chopper	4 wheel dr 70hp	3.00	4.02	3.23	4.28	3.40	10.92
Weed sprayer	2 wheel dr 35hp	2.75	1.63	8.00	4.84	4.29	17.13
Fertilizer spreader	2 wheel dr 50hp	3.00	6.62	1.96	1.75	3.15	6.86
Brush windrow	2 wheel dr 50hp	3.00	2.01	6.47	5.46	10.46	22.39
Gopher machine	2 wheel dr 50hp	2.50	3.15	4.12	3.51	4.97	12.60

Table 4. Estimated Per Acre Returns Over Cash Costs at Varying Yields and Prices¹.

Price per Bin	----- Bins per Acre -----						
	20	30	40	50	60	70	80
\$ 175	(581)	908	2,397	3,885	5,374	6,863	8,351
\$ 200	(81)	1,658	3,397	5,135	6,874	8,613	10,351
\$ 225	419	2,408	4,397	6,385	8,374	10,363	12,351
\$ 250	919	3,158	5,397	7,635	9,874	12,113	14,351
\$ 275	1,419	3,908	6,397	8,885	11,374	13,863	16,351
\$ 300	1,919	4,658	7,397	10,135	12,874	15,613	18,351
\$ 325	2,419	5,408	8,397	11,385	14,374	17,363	20,351

Table 5. Estimated Per Acre Returns Over Total Economic Costs at Varying Yields and Prices².

Price per Bin	----- Bins per Acre -----						
	20	30	40	50	60	70	80
\$ 175	(3,702)	(2,213)	(725)	764	2,253	3,741	5,230
\$ 200	(3,202)	(1,463)	275	2,014	3,753	5,491	7,230
\$ 225	(2,702)	(713)	1,275	3,264	5,253	7,241	9,230
\$ 250	(2,202)	37	2,275	4,514	6,753	8,991	11,230
\$ 275	(1,702)	787	3,275	5,764	8,253	10,741	13,230
\$ 300	(1,202)	1,537	4,275	7,014	9,753	12,491	15,230
\$ 325	(702)	2,287	5,275	8,264	11,253	14,241	17,230

¹Table 4 estimates the returns over cash costs per acre based on varying yields and prices for a full producing orchard. In this budget a grower should expect \$7,635, based on a yield of 50 bins of apples at \$250 per bin. At this price, as yields increase the returns to a grower increase as well and conversely, returns decrease as yields decrease.

²Table 5 estimates the returns over total economic costs per acre based on varying yields and prices for a full producing orchard. In this budget a grower should expect \$4,514, based on a yield of 50 bins of apples at \$250 per bin. At this price, as yields increase the returns to a grower increase as well and conversely, returns decrease as yields decrease.