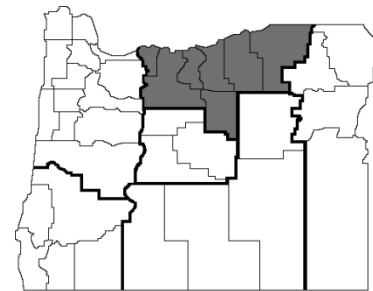


Enterprise Budget

Pears, d'Anjou & Fresh Bartlett, North Central Region

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This enterprise budget estimates the typical per-acre costs associated with d'anjou and fresh Bartlett pear 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 fresh market pear 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 d'Anjou and fresh Bartlett 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 8 producing acres of d'Anjou and fresh Bartlett pears, with 242 trees per acre (10' x 18' spacing) with 75 percent d'Anjou and 25 percent Bartlett trees. The trees are young, ranging in age from 9 to 12 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 \$217.50 per bin after packing costs have been subtracted. Each bin weighs 1,050 pounds. The land, with irrigation rights, is valued at \$15,000 per acre, with \$60 per acre property taxes. Eight acres of the 12 producing acres in this fresh market Bartlett pear orchard have solid set irrigation; the remaining 4 acres use handlines. The solid set irrigation system is valued at \$2,000 per acre, and the handlines at \$400 per acre.

Labor and Housing

General labor is hired at a rate of \$12.50 per hour, tractor drivers paid \$17.25 per hour, and harvest labor costs \$29.50 per bin, all of which include worker's compensation, unemployment insurance, and other labor overhead expenses. Housing for summer labor is

valued at \$300,000 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 \$1,000 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 (5 percent) and long term capital (5 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 \$3.75 and \$3.35 per gallon, respectively. 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. 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.

Pears, d'Anjou & fresh Bartlett, 2016 \$/acre economic costs and returns.

Pears, d'Anjou & fresh Bartlett, 2016 \$/acre economic costs and returns.						
GROSS INCOME						
	Quantity	Unit	\$/Unit	Total	Price/bin	Your Income
Pears	50.00	bins	217.50	10,875.00	217.50	
Total gross income				10,875.00	217.50	
VARIABLE CASH COSTS						
Description	Labor	Machinery	Materials	Total	Cost/bin	Your Costs
Pruning and training	25.0 hours	\$312.50	\$0.00	\$0.00	\$312.50	\$6.25
Thinning	18.0 hours	225.00	0.00	0.00	225.00	4.50
Tree removal & tree replacement	2.5 hours	74.38	21.76	16.00	112.14	2.24
Raking and shredding brush	1.0 x/acre	6.20	5.68	0.00	11.88	0.24
Fertilizer & lime	2.0 applications	3.76	2.16	295.00	300.92	6.02
Herbicide strip maintenance (.30x)	2.0 applications	15.33	6.00	50.00	71.33	1.43
Insecticides & fungicides	10.0 applications	52.70	61.25	800.00	913.95	18.28
Pheromone disruption (1/2 rate)	2.25 hours	28.13	0.00	110.00	138.13	2.76
Bee rental	2.0 hives	0.00	0.00	110.00	110.00	2.20
Flailing/mowing orchard floor	8.0 times	49.60	44.21	0.00	93.81	1.88
Rodent control	1.0 applications	3.95	2.20	40.00	46.16	0.92
Frost protection	2.0 hour	25.00	122.70	0.00	147.70	2.95
Irrigation	5.0 hours	62.50	0.00	21.00	83.50	1.67
Ladders, pruning, & picking equip.	1.0 x/acre	0.00	12.18	0.00	12.18	0.24
Harvesting costs	50.0 bins	1,721.06	122.75	175.00	2,018.81	40.38
Supervisory labor	12.5 hours					
Tractor drivers	5.21 hours					
Hauling fruit to packinghouse	3.50 \$/bin					
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03	3.60
Seasonal housing facilities	1.0 x/acre	0.00	0.00	113.57	113.57	2.27
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00	2.50
Interest: operating capital	6.0 months	0.00	0.00	62.71	62.71	1.25
Total variable costs		2,580.11	580.93	1,918.28	5,079.32	101.59
FIXED CASH COSTS						
			Unit	Total	Cost/bin	Your Costs
Water assessment			acre	80.00	1.60	
Property insurance			acre	25.00	0.50	
Property taxes			acre	60.00	1.20	
Total fixed cash costs				165.00	3.30	
FIXED NON-CASH COSTS						
			Unit	Total	Cost/bin	Your Costs
Machinery and equipment - depreciation & interest			acre	575.14	11.50	
Pickup, truck & Gator - depreciation & interest			acre	95.95	1.92	
Foreman housing			acre	171.43	3.43	
Seasonal housing facilities			acre	250.00	5.00	
Land interest charge			acre	750.00	15.00	
Amortized establishment costs*			acre	1,791.58	35.83	
Total fixed non-cash costs				3,634.10	72.68	
Total fixed costs				3,799.10	75.98	
Total of all costs per acre				\$8,878.42	\$177.57	
Net projected returns				\$1,996.58	\$39.93	

*Based on "Orchard Economics: The Cost of Establishing and Producing d'Anjou and fresh Bartlett Pears in the Hood River Valley", AEB 0056, July, 2016.

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	\$ 39,000	455	10	\$ 11,520
Tractor	2 wheel dr 50hp, old	5,000	171	20	642
Tractor	2 wheel dr 35 hp, old	3,000	52	20	385
Air-blast sprayer	400 gallon unit, PTO, new	19,000	107	10	3,360
Air-blast sprayer	400 gallon unit, PTO, older	10,000	72	10	1,768
Flail chopper	8' unit	7,000	152	7	1,786
Weed sprayer	100 gallon unit	2,500	52	15	240
Fertilizer spreader		3,075	13	20	160
Brush rake		3,500	21	20	182
Gopher machine		2,400	13	20	125
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	14,000	3,000	5	6,274
Auger		3,200	35	20	167
Front-end loader & backforks		5,800	64	10	1,026
Ladders	20 units, per 70 acres	3,185	N/A	10	N/A
Picking bags	20 units, per 70 acres	480	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	Solid set, per acre	2,000	N/A	25	N/A
Irrigation system	Handlines, per acre	400	N/A	25	N/A
Irrigation system ¹	Micro, per acre	2,100	N/A	20	N/A
Irrigation system ¹	Drip system, per acre	1,250	N/A	25	N/A
Wind machine	3 units, propane, per 70 acres	99,000	70	30	1,521
Propane heaters	15 units, per acre	81,900	70	10	9,656
Trellis system ¹	Five-wire vertical, per acre	1,750	N/A	20	N/A
Trellis system ¹	per acre	5,000	N/A	20	N/A
Housing facilities	1 unit, per 70 acres	300,000	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.	Depreciation & Interest			
----- Costs per hour -----							
Tractor	4 wheel dr 70hp, new	\$11.56	\$0.53	\$8.82		\$20.91	
Tractor	2 wheel dr 50hp, old	8.48	0.12	\$2.10		10.69	
Tractor	2 wheel dr 35 hp, old	5.78	0.02	4.16		9.96	
Air-blast sprayer	400 gallon unit, PTO, new	0.00	7.96	19.78		27.74	
Air-blast sprayer	400 gallon unit, PTO, older	0.00	3.71	15.62		19.32	
Flail chopper	8' unit	0.00	3.28	6.33		9.62	
Weed sprayer	100 gallon unit	0.00	0.95	4.23		5.18	
Fertilizer spreader		0.00	1.29	17.44		18.73	
Brush rake		0.00	0.42	12.31		12.73	
Gopher machine		0.00	1.02	13.24		14.26	
----- Costs per mile -----							
Pickup	1/2 ton 4x4, new	\$0.36	\$0.05	\$0.28		\$0.69	
Truck	2 ton, used	0.72	0.57	0.37		1.66	
Gator	4 wheel, new	1.04	0.02	0.68		1.74	
----- Costs per acre -----							
Auger		\$0.00	\$0.27	\$3.37		\$3.64	
Front-end loader & backforks		0.00	\$2.89	10.13		13.02	
Ladders	20 units, per 70 acres	0.00	2.73	5.69		8.42	
Picking bags	20 units, per 70 acres	0.00	0.41	3.60		4.01	
Picking buckets for wine grapes		0.00	0.43	4.50		4.93	
Chain & pruning saws	3 units each, 1-loppers	6.47	2.57	15.36		24.40	
Irrigation system 1	Solid set, per acre	0.00	20.00	130.00		150.00	
Irrigation system	Handlines, per acre	0.00	4.00	26.00		30.00	
Irrigation system 1	Micro, per acre	0.00	21.00	157.50		178.50	
Irrigation system 1	Drip system, per acre	0.00	12.50	81.25		93.75	
Wind machine	3 units, propane, per 70 acres	62.10	30.90	82.32		175.32	
Propane heaters	15 units, per acre	18.00	11.70	0.00		29.70	
Trellis system 1	Five-wire vertical, per acre	0.00	17.50	131.25		148.75	
Trellis system 1	per acre	0.00	50.00	375.00		425.00	
Housing facilities	1 unit, per 70 acres	0.00	113.57	250.00		363.57	

Table 3. Estimated Cost of Each Operation with Power Unit for an 18' Between-Row Spacing.

Operation	Tractor	Miles per hour	Acres per hour	Labor cost per acre	-- Machine costs --		Total cost per acre
					Variable cost per acre	Fixed cost per acre	
Air-blast sprayer	4 wheel dr 70hp	2.00	3.27	\$5.27	\$6.12	\$8.74	\$20.13
Flail chopper	4 wheel dr 70hp	3.00	2.78	6.20	5.53	5.44	17.17
Weed sprayer	2 wheel dr 35hp	2.75	2.25	7.67	3.00	3.73	14.39
Fertilizer spreader	2 wheel dr 50hp	3.00	9.16	1.88	1.08	2.13	5.09
Brush rake ¹	N/A	N/A	N/A	0.00	0.15	4.42	4.58
Gopher machine	2 wheel dr 50hp	2.50	4.36	3.95	2.20	3.51	9.67

¹Included with flail chopper as one operation.

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

Price per Bin	Bins per Acre						
	20	30	40	50	60	70	80
\$ 125	\$ (1,533)	\$ (687)	\$ 159	\$ 1,006	\$ 1,852	\$ 2,698	\$ 3,544
\$ 150	(1,033)	63	1,159	2,256	3,352	4,448	5,544
\$ 175	(533)	813	2,159	3,506	4,852	6,198	7,544
\$ 200	(33)	1,563	3,159	4,756	6,352	7,948	9,544
\$ 225	467	2,313	4,159	6,006	7,852	9,698	11,544
\$ 250	967	3,063	5,159	7,256	9,352	11,448	13,544
\$ 275	1,467	3,813	6,159	8,506	10,852	13,198	15,544

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

Price per Bin	Bins per Acre						
	20	30	40	50	60	70	80
\$ 125	\$ (4,966)	\$ (4,119)	\$ (3,273)	\$ (2,427)	\$ (1,581)	\$ (734)	\$ 112
\$ 150	(4,466)	(3,369)	(2,273)	(1,177)	(81)	1,016	2,112
\$ 175	(3,966)	(2,619)	(1,273)	73	1,419	2,766	4,112
\$ 200	(3,466)	(1,869)	(273)	1,323	2,919	4,516	6,112
\$ 225	(2,966)	(1,119)	727	2,573	4,419	6,266	8,112
\$ 250	(2,466)	(369)	1,727	3,823	5,919	8,016	10,112
\$ 275	(1,966)	381	2,727	5,073	7,419	9,766	12,112

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