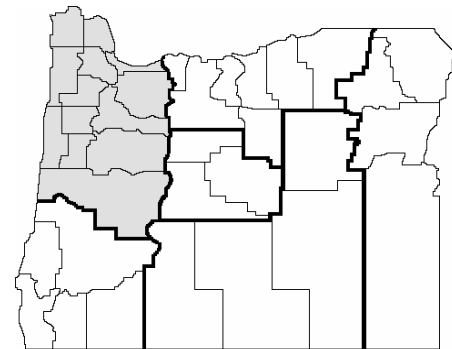


# Enterprise Budget

## Leaf Lettuce, Conventional, Fresh Market, Willamette Valley Region

Clark Seavert, Agricultural Economist, NWREC,  
Robert McReynolds, Extension Horticulture, NWREC  
Chip Bubl, Extension Horticulture, Columbia County,  
Nick Andrews, Extension Horticulture, NWREC, and  
Jenny Freeborn, Faculty Research Assistant, NWREC,  
Oregon State University



EM 8932  
March 2007

This enterprise budget estimates the typical per-acre costs associated with growing conventional, fresh market leaf lettuce as a two-crop annual rotation in the Willamette Valley. It should be used as a guide to estimate your actual costs and 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 growing conventional, fresh market leaf lettuce; however, this does not represent the only production method. Assistance provided by area producers is greatly appreciated.

### Typical Farm

The typical farm growing conventional, leafy fresh market vegetables in the Willamette Valley consists of 100 total tillable acres. It has four tractors pulling various pieces of equipment, a shop, machine shed, and packing shed with equipment.

Other leafy vegetables grown on this farm, on a rotational basis, include radishes, green onions, cilantro, table beets, spinach, Napa cabbage and bokchoy.

The farm is managed by the owner and another family member; therefore this operation must generate two family incomes annually.

### Land, Buildings and Irrigation

This budget is based on producing one acre of conventional, fresh market leaf lettuce grown in a two-crop annual rotation. Average production is 900 cartons per acre at a gross price to the grower of \$8 per carton. Each carton contains 24 heads of lettuce.

The land is owned and valued at \$20,000 per acre, with \$35 per acre property taxes; however, a \$400 per acre rental rate is used as a return on investment to the owner for their investment in the land.

This farm is irrigated with a hand-line irrigation system that is rented at a rate of \$110 per acre per year.

### Labor

General labor is hired at a rate of \$10 per hour, tractor drivers paid \$12 per hour, and hand labor for harvest costs \$1.30 per carton, all of which include workers

compensation, unemployment insurance, and other labor overhead expenses.

### Capital

Interest on operating capital (8 percent) is treated as a cash expense. One-half of the cash expenses are borrowed for a 6 month period. Interest on intermediate and long term capital (8 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 100-acre conventional, fresh market leafy vegetable farm in the Willamette Valley.

A detailed breakdown of machinery values is shown in Table 2. Estimated machinery costs are shown in Table 3, assuming straight line depreciation. The machinery costs are estimated based on the total farm use of the machinery. Table 4 shows the per acre labor, variable, and fixed costs for certain machinery operations in the field.

Gasoline costs \$2.50 per gallon, and diesel costs \$2.60 per gallon.

### Operations

The cultural operations are listed approximately in the order in which they are performed. An 80-hp tractor is used to pull the disk, rotary tiller, deep chisel, and mold board plow. A 20-hp tractor is used to pull the weed cultivator. A 60-hp tractor is used to pull the fertilizer spreader, transplanter or direct seed drill, depending on crop, and a weed sprayer. The 50-hp tractor is used at harvest to pull a 4-wheel trailer that hauls cartons of vegetables out of the field.

### Break even Analysis

Tables 5 and 6 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.

**OREGON STATE UNIVERSITY**

**EXTENSION SERVICE**

**Table 1. Leaf Lettuce, Conventional, Fresh Market, 2007, \$/acre economic costs and returns**

<b>GROSS INCOME</b>		<b>Quantity</b>	<b>Unit</b>	<b>\$/Unit</b>	<b>Total</b>	<b>Price/Carton</b>	<b>Your Income</b>		
Leaf Lettuce		900	cartons	\$8.00	\$7,200.00	\$8.00			
Total <b>gross</b> income					7,200.00	8.00			
<b>VARIABLE CASH COSTS</b>		<b>Description</b>	<b>Units</b>	<b>Labor</b>	<b>Machinery</b>	<b>Materials</b>	<b>Total</b>	<b>Cost/Carton</b>	<b>Your Cost</b>
<i>Field Preparations &amp; Planting</i>									
	Deep chisel	0.50	x/acre	\$3.64	\$7.86	\$0.00	\$11.50	\$0.0128	
	Spray herbicide	1.00	x/acre	3.05	4.97	12.00	20.01	0.0222	
	Lime application, custom	0.25	x/acre	0.00	0.00	75.00	75.00	0.0833	
	Moldboard plow	1.00	x/acre	9.70	22.19	0.00	31.90	0.0354	
	Disk	1.00	x/acre	5.15	11.22	0.00	16.38	0.0182	
	Fertilize	1.00	x/acre	1.77	2.81	90.00	94.58	0.1051	
	Rotary till	1.00	x/acre	9.70	25.18	0.00	34.88	0.0388	
	Transplanting	1.00	x/acre	205.38	63.27	840.00	1,108.65	1.2318	
	Planting labor	18.00	hours						
	Lettuce transplants	0.03	\$ each						
	Lettuce transplants	28,000	transp.						
	Cultivating weeds	1.50	x/acre	15.46	18.45	0.00	33.91	0.0377	
	Fertilizer Sidedresser	1.00	x/acre	13.75	15.36	0.00	29.11	0.0323	
	Irrigation			22.50	0.00	85.00	107.50	0.1194	
	Labor, \$7.50/set	3.00	sets						
	Electricity, \$10.00/set	3.00	sets						
	Pipe rental, \$110.00/acre	0.50	acre						
	Spray insecticides	1.00	x/acre	3.05	4.97	100.00	108.01	0.1200	
	Spray herbicide	1.00	x/acre	3.05	4.97	60.00	68.01	0.0756	
<i>Harvesting</i>									
	Harvesting labor	900	carton	1,170.00	0.00	0.00	1,170.00	1.3000	
	Tractor & trailer	6.50	hours	78.00	125.74	0.00	203.74	0.2264	
<i>Packing &amp; Materials</i>									
	Cartons	900	carton	0.00	0.00	1,170.00	1,170.00	1.3000	
	Hydro-cooling	900	carton	0.00	0.00	90.00	90.00	0.1000	
	Refrigeration	900	carton	0.00	0.00	90.00	90.00	0.1000	
	Delivery to market	900	carton	72.00	0.00	0.00	72.00	0.0800	
<i>Other Costs</i>									
	Pickups, truck & ATV	0.50	x/acre	0.00	103.38	0.00	103.38	0.1149	
	Shop & machine shed	0.50	x/acre	0.00	0.00	4.00	4.00	0.0044	
	Miscellaneous and overhead	0.50	x/acre	0.00	0.00	37.50	37.50	0.0417	
	Interest: operating capital	6.0	months	<u>0.00</u>	<u>0.00</u>	<u>93.60</u>	<u>93.60</u>	<u>0.1040</u>	
Total <b>variable</b> costs				1,616.18	410.38	2,747.10	4,773.66	5.3041	
<b>FIXED CASH COSTS</b>					<b>Unit</b>	<b>Total</b>	<b>Cost/Carton</b>		
	Property insurance	0.50	x/acre		acre	17.50	0.0194		
	Property taxes	0.50	x/acre		acre	17.50	0.0194		
	Field sanitation equipment	0.50	x/acre		acre	15.00	0.0167		
	Land rent	0.50	x/acre		acre	<u>200.00</u>	<u>0.2222</u>		
Total <b>cash</b> costs						250.00	0.2778		
<b>FIXED NON-CASH COSTS</b>					<b>Unit</b>	<b>Total</b>	<b>Cost/Carton</b>		
Machinery and equip - depreciation, interest & insurance					acre	100.91	0.1121		
Pickups, truck & ATV - depreciation, interest & insurance					acre	47.77	0.0531		
Shop & machine shed - depreciation, interest & insurance					acre	<u>10.88</u>	<u>0.0121</u>		
Total <b>non-cash</b> costs						159.56	0.1773		
Total <b>fixed</b> costs						409.56	0.4551		
<b>Total of all costs per acre</b>						<b>\$5,183.22</b>	<b>\$5.7591</b>		
<b>Net projected returns</b>						<b>\$2,016.78</b>	<b>\$2.2409</b>		

**Table 2. Machinery Cost Assumptions.**

<b>Machine</b>	<b>Size or description</b>	<b>Current Market Value</b>	<b>Hours or miles of annual use</b>	<b>Expected life (years)</b>	<b>Salvage Value</b>
Tractor # 1	4 wheel dr 80hp, new	\$60,000	389	20	\$7,699
Tractor # 2	2 wheel dr 20hp, used	7,000	243	20	898
Tractor # 3	4 wheel dr 60hp, used	20,000	491	20	2,566
Tractor # 4	4 wheel dr 50hp, used	15,000	650	20	1,925
Disk	12 ft light duty	5,000	86	10	884
Rotary Tiller	8 ft	10,000	162	10	1,768
Deep Chisel	8 ft	2,000	61	20	104
Mold Board Plow	6 ft	5,000	81	20	261
Weed Cultivator	6 ft	4,000	129	20	208
Fertilizer Spreader	20 ft spinner broadcast	1,000	29	20	52
Transplanter	6 ft	10,000	211	15	960
Direct Seed Drill	6 ft	10,000	98	15	960
Weed Sprayer	6 ft	2,000	152	15	192
Pickup # 1	3/4 ton 4x4, new	30,000	20,000	10	11,345
Pickup # 2	3/4 ton 4x4, used	5,000	10,000	20	753
Truck	2 ton, used	25,000	20,000	20	3,763
ATV	4 wheeler, new	5,500	200	10	1,625
Fertilizer Sidedresser		1,500	115	20	78
Trailer	4-wheel pull	2,000	650	20	104
Shop	20' x 40'	20,000	N/A	40	0
Machine Shed	20' x 100'	12,000	N/A	40	0

**Table 3. Machinery Cost Calculations.**

<b>Machine</b>	<b>Size or description</b>	<b>--- Variable costs ---</b>		<b>--- Fixed costs ---</b>		<b>Total cost</b>
		<b>Fuel &amp; Lube</b>	<b>Repairs &amp; Maint.</b>	<b>Depr. &amp; Interest</b>	<b>Insurance</b>	
----- Costs per hour -----						
Tractor # 1	4 wheel dr 80hp, new	\$23.92	\$1.40	\$13.68	\$0.78	\$39.78
Tractor # 2	2 wheel dr 20hp, used	11.96	0.24	2.55	0.15	14.90
Tractor # 3	4 wheel dr 60hp, used	17.94	0.59	3.61	0.21	22.35
Tractor # 4	4 wheel dr 50hp, used	17.94	0.59	2.05	0.12	20.69
Disk	12 ft light duty	0.00	0.81	7.53	0.21	8.55
Rotary Tiller	8 ft	0.00	5.82	8.00	0.22	14.04
Deep Chisel	8 ft	0.00	0.60	2.95	0.10	3.66
Mold Board Plow	6 ft	0.00	2.13	5.53	0.20	7.86
Weed Cultivator	6 ft	0.00	2.12	2.78	0.10	4.99
Fertilizer Spreader	20 ft spinner broadcast	0.00	0.54	3.04	0.11	3.68
Transplanter	6 ft	0.00	11.39	4.92	0.16	16.47
Direct Seed Drill	6 ft	0.00	4.90	10.60	0.33	15.84
Weed Sprayer	6 ft	0.00	1.05	1.37	0.04	2.46
----- Costs per mile -----						
Pickup # 1	3/4 ton 4x4, new	\$0.24	\$0.03	\$0.18	\$0.06	\$0.51
Pickup # 2	3/4 ton 4x4, used	0.24	0.06	0.04	0.02	0.36
Truck	2 ton, used	0.48	0.10	0.11	0.07	0.76
----- Costs per acre -----						
ATV	4 wheeler, new	\$6.90	\$0.15	\$6.73	\$0.32	\$14.10
Fertilizer Sidedresser		0.00	1.39	1.34	0.05	2.78
Trailer	4-wheel pull	0.00	5.33	1.79	0.06	7.18
Shop	20' x 40'	0.00	5.00	13.00	0.60	18.60
Machine Shed	20' x 100'	0.00	3.00	7.80	0.36	11.16

**Table 4. Estimated Cost of Each Operation with Power Unit.**

Operation	Tractor	Miles per hour	Acres per hour	-- Machine costs --			
				Labor costs per acre	Variable costs per acre	Fixed costs per acre	Total costs per acre
Disk	Tractor # 1	2.00	2.33	\$5.15	\$11.22	\$9.54	\$25.91
Rotary Tiller	Tractor # 1	1.50	1.24	9.70	25.18	18.34	53.22
Deep Chisel	Tractor # 1	2.00	1.65	7.28	15.72	10.62	33.62
Mold Board Plow	Tractor # 1	2.00	1.24	9.70	22.19	16.33	48.22
Weed Cultivator	Tractor # 2	2.00	1.16	10.31	12.30	4.79	27.39
Fertilizer Sidedresser	Tractor # 2	1.50	0.87	13.75	15.36	4.48	33.58
Fertilizer Spreader	Tractor # 3	4.00	6.79	1.77	2.81	1.03	5.60
Transplanter	Tractor # 3	1.00	0.47	25.38	63.27	18.81	107.46
Direct Seed Drill	Tractor # 3	2.00	1.02	11.78	23.00	14.49	49.27
Weed Sprayer	Tractor # 3	2.50	3.94	3.05	4.97	1.33	9.34

**Table 5. Estimated Per Acre Returns Over CASH Costs at Varying Yields & Prices.**

Price/Carton	----- Cartons per Acre -----							
	700	750	800	850	900	950	1,000	
\$ 6.00	\$ (248)	\$ (92)	\$ 64	\$ 220	\$ 376	\$ 532	\$ 688	
\$ 6.50	102	283	464	645	826	1,007	1,188	
\$ 7.00	452	658	864	1,070	1,276	1,482	1,688	
\$ 7.50	802	1,033	1,264	1,495	1,726	1,957	2,188	
\$ 8.00	1,152	1,408	1,664	1,920	2,176	2,432	2,688	
\$ 8.50	1,502	1,783	2,064	2,345	2,626	2,907	3,188	
\$ 9.00	1,852	2,158	2,464	2,770	3,076	3,382	3,688	

**Table 6. Estimated Per Acre Returns Over TOTAL ECONOMIC Costs at Varying Yields & Prices.**

Price/Carton	----- Cartons per Acre -----							
	700	750	800	850	900	950	1,000	
\$ 6.00	\$ (407)	\$ (251)	\$ (95)	\$ 61	\$ 217	\$ 373	\$ 529	
\$ 6.50	(57)	124	305	486	667	848	1,029	
\$ 7.00	293	499	705	911	1,117	1,323	1,529	
\$ 7.50	643	874	1,105	1,336	1,567	1,798	2,029	
\$ 8.00	993	1,249	1,505	1,761	2,017	2,273	2,529	
\$ 8.50	1,343	1,624	1,905	2,186	2,467	2,748	3,029	
\$ 9.00	1,693	1,999	2,305	2,611	2,917	3,223	3,529	