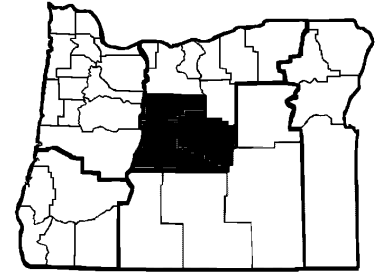


Enterprise Budget

Carrot Seed Production Under Drip Irrigation, Central Oregon Region

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This enterprise budget estimates the typical costs and returns of producing hybrid carrot seed under drip irrigation in the Madras and Culver areas of central Oregon. While efforts were made to reflect common practices, it is not representative of any particular farm and should be used only as a guide to estimate actual costs. The major assumptions used in constructing this budget are discussed below. Assistance provided by area producers is greatly appreciated.

Cropping Pattern

This budget is based on a typical 600-acre farm with 18 acres under drip irrigation in production of hybrid carrot seed following wheat. The budget includes production costs for 1 acre, with a yield of 430 pounds per acre. A summary of the estimated costs and returns per acre is shown in Table 1.

Comparison of Sprinkler and Drip Irrigation

The costs and returns of sprinkler and drip irrigation are compared on a per-acre basis in Table 2. The drip tape is installed in the spring. Sprinkler irrigation is used to bring up the carrots in the fall. The sprinkler equipment is not considered a drip irrigation expense because the equipment is previously owned. Using drip irrigation increases seed yields by an average of 25 percent. Drip irrigation also decreases water usage by 50 percent. While some of the decrease in irrigation and weeding labor is offset by increased installation labor, a significant decrease in cost still exists.

Land and Irrigation

A land lease charge of \$100 per acre is included to represent the cost of leasing or owning the land. The charge is based on the cost of a long-term lease for good-quality irrigated land. A water charge of \$3.17 per acre-inch covers the cost of irrigation water and canal maintenance. Calculations are based on the North Unit Irrigation District rates for Deschutes River water rights. \$40 per acre covers the fixed costs of the drip irrigation system, including the repair, maintenance, and fuel. Interest and depreciation on the system are also factored into the fixed cost. The yearly recurring costs of drip irrigation are in variable costs. A 12 percent discount is assumed on the drip tape.

Labor

Hand labor costs \$8.00 per hour, and operator labor costs \$13.65 per hour. Both include worker's compensation, social security taxes, and other labor overhead expenses. Labor hours for machinery operation are calculated by multiplying 1.21 times machine hours to allow for machinery setup, movement, and adjustments.

Capital

Opportunity costs of capital are charged at a rate of 9 percent for current, intermediate, and long-term capital provided by the owner.

Machinery and Equipment

The machinery complement is sufficient for producing carrot seed. A detailed breakdown of machinery values and costs used in this budget is shown in Table 4. January 1998 replacement costs are used. The machinery costs per hour are estimated based on the total farm use of the machinery. Fixed costs for machinery and equipment include the cost of interest and depreciation.

Operations

The cultural operations are listed in the budget in the approximate order in which they typically are performed. Table 3 shows the cost of field operations with owned machinery. Land preparation includes burning the wheat stubble, one irrigation set, a fertilizer/weed control application, tillage, and bedding up. Hybrid seed is planted in August followed by four sprinkler irrigation sets, several pesticide applications, cultivation of the small carrots, and covering the male carrots with fabric, which requires 5 hours of hand labor.

In the spring, removal of the row covering, thinning, weeding, and replanting require a total of 6 hours of hand labor per acre. Installing the drip irrigation system requires 3 hours of labor. Insecticides and fungicides are applied as necessary. An additional 9.25 inches of water are applied over 10 sets using drip irrigation. Fertilizer is applied through the drip tape during two of those sets, an insecticide is applied during one set, and the drip lines are cleaned during a fourth set. Prior to harvest, the male pollinator rows are rolled down. The carrot seed stalks are swathed and combined.

Other

A charge of \$10 per acre is included to cover general insurance, tools, office supplies, and other expenses. A pickup and ATV are utilized for hauling supplies, checking irrigation, and other activities related to carrot seed production.

Total variable cost is \$1,529, and the break-even price over variable costs is \$3.56 per lb. The total of all costs is \$1,881, with a break-even price over total costs of \$4.37 per lb.

Table 1. Carrot seed production under drip irrigation: Summary of estimated costs and returns per acre.

Item	Unit	Price	Quantity	Amount	Your Farm
		\$		\$	
INCOME					
Carrot Seed	Pound	7.36	430.00	3,164.80	_____
TOTAL INCOME				3,164.80	_____
VARIABLE COSTS					
Herbicides	Acre	93.16	1.00	93.16	_____
Insecticides	Acre	236.30	1.00	236.30	_____
Fungicides	Acre	49.44	1.00	49.44	_____
Custom Applications	Acre	87.42	1.00	87.42	_____
Seed	Acre	17.00	1.00	17.00	_____
Bee Hive Rental	Acre	164.00	1.00	164.00	_____
Other	Acre	17.06	1.00	17.06	_____
Hand Labor	Acre	148.83	1.00	148.83	_____
Fertilizer	Acre	123.78	1.00	123.78	_____
Water	Acre	57.85	1.00	57.85	_____
Drip Irrigation	Acre	264.27	1.00	264.27	_____
Operator Labor	Hour	13.65	7.38	100.77	_____
Diesel Fuel	Gal	1.30	21.73	28.25	_____
Gasoline	Gal	1.55	4.43	6.87	_____
Repair & Maintenance	Acre	64.99	1.00	64.99	_____
Interest on Operating Capital	Acre	68.75	1.00	68.75	_____
TOTAL VARIABLE COSTS				1,528.73	_____
INCOME ABOVE VARIABLE COSTS				1,636.07	_____
FIXED COSTS					
Implements	Acre	39.19	1.00	39.19	_____
Tractors	Acre	80.58	1.00	80.58	_____
Self-propelled Equipment	Acre	79.88	1.00	79.88	_____
Trucks	Acre	2.89	1.00	2.89	_____
General Overhead	Acre	10.00	1.00	10.00	_____
Land Costs	Acre	100.00	1.00	100.00	_____
Irrigation Systems	Acre	40.18	1.00	40.18	_____
TOTAL FIXED COSTS				352.72	_____
TOTAL OF ALL COSTS				1,881.45	_____
NET INCOME				1,283.35	_____

Table 2. Carrot seed production under drip irrigation: Comparative summary of sprinkler and drip irrigation estimated costs and returns per acre.

Item	Sprinkler ¹	Drip	Percent Change
	\$	\$	
INCOME			
Drip-irrigated carrot seed (430 lb @ \$7.36/lb)	0.00	3,164.80	
Sprinkler-irrigated carrot seed (345 lb @ \$7.36/lb)	2,539.20	0.00	
TOTAL INCOME	2,539.20	3,164.80	25
VARIABLE COSTS			
Herbicides	93.16	93.16	
Insecticides	229.36	236.30	3
Fungicides	49.44	49.44	
Custom Applications	93.42	87.42	-6
Seed	17.00	17.00	
Bee Hive Rental	164.00	164.00	
Other	13.00	17.06	31
Hand Labor ²	172.95	148.83	-14
Fertilizer ²	93.95	123.78	32
Water	92.72	57.85	-38
Drip Irrigation	0.00	264.27	
Operator Labor	92.41	100.77	9
Diesel Fuel	25.18	28.25	12
Gasoline	6.87	6.87	
Repair & Maintenance	59.48	64.99	
Interest on Operating Capital	60.44	68.75	14
TOTAL VARIABLE COSTS	1,263.38	1,528.73	21
INCOME ABOVE VARIABLE COSTS	1,275.82	1,636.07	28
FIXED COSTS			
Implements	35.60	39.19	10
Tractors	83.33	80.58	-3
Self-propelled Equipment	79.75	79.88	
Trucks	2.89	2.89	
General Overhead	10.00	10.00	
Land Costs	100.00	100.00	
Irrigation Systems	55.00	40.18	-27
TOTAL FIXED COSTS	366.57	352.72	-4
TOTAL OF ALL COSTS	1,629.95	1,881.45	15
NET INCOME	909.25	1,283.35	41

¹These numbers are based on EM 8573, *Enterprise Budget: Carrot Seed Production, Central Oregon Region*.

²The sprinkler prices for these items were changed to reflect 2003 prices.

Table 3. Carrot seed production under drip irrigation: Estimated resource use and costs for field operations.

Operation	Perf.	Times Over	Month	Tractor Cost		Equipment Cost		Labor		Operating Input	Total Cost
	Rate			Variable	Fixed	Variable	Fixed	Hours	\$		
	Hours/acre								\$	\$	\$
Open Field Burn Previous Year's Crop	0.033	1	Aug	---	---	0.36	2.37	0.22	1.97	1.00	5.70
Disk	0.1	1	Aug	2.13	2.52	1.02	3.59	0.13	1.81	---	11.07
Fertilizer ¹	---	1	Aug	---	---	---	---	---	---	61.92	61.92
64# N, 64# P, 64# K	---	---	---	---	---	---	---	---	---	---	---
Cultimulch	0.1	1	Aug	2.34	2.78	0.24	1.26	0.15	1.99	---	8.61
Bed Up Field	0.2	1	Aug	3.11	4.22	0.08	0.57	0.24	3.30	---	11.28
Plant Carrot Seed	0.5	1	Aug	3.90	5.57	---	---	0.60	8.25	22.00	39.72
Irrigate Labor	---	4	Aug–Oct	---	---	0.65	0.52	2.16	16.58	---	17.75
Water	---	---	---	---	---	---	---	---	---	28.53	28.53
Preemergence Weed Control	---	1	Aug	---	---	---	---	---	---	14.87	14.87
Insect Control ¹	---	1	Sept	---	---	---	---	---	---	116.23	116.23
Grass Control ¹	---	1	Sept	---	---	---	---	---	---	26.13	26.13
Cultivation	0.25	1	Sept	3.89	5.28	0.10	1.05	0.30	4.12	---	14.44
Weed Control ¹	---	1	Sept	---	---	---	---	---	---	27.43	27.43
Disease Control ¹	---	1	Oct	---	---	---	---	---	---	32.47	32.47
Cover Male Carrot Rows	0.5	1	Nov	7.79	10.56	0.50	5.28	2.61	23.61	---	47.74
Remove Covering From Male Rows	1	1	Mar	15.59	21.12	1.00	10.56	5.21	47.23	---	95.50
Cultivation	0.25	1	Apr	3.89	5.28	0.10	1.05	0.30	4.12	---	14.44
Thin Carrots	1	1	Apr	7.81	11.14	0.45	6.41	1.21	16.51	---	42.32
Install Drip Tape	0.8	1	Apr	12.47	16.90	0.00	0.86	2.97	29.21	269.27	328.71
Fertilizer Through Drip Tape ²	---	2	Apr–May	---	---	0.16	0.13	0.54	4.31	33.89	---
25# N, 13.5# P, 13.5# K	---	---	---	---	---	---	---	---	---	---	---
Water	---	---	---	---	---	---	---	---	---	5.86	44.35
Weed Control ¹	---	1	Apr	---	---	---	---	---	---	31.55	31.55
Disease Control ¹	---	1	May	---	---	---	---	---	---	32.47	32.47
Irrigate Labor	---	6	May–Aug	---	---	0.97	0.79	0.84	6.71	---	---
Water	---	---	---	---	---	---	---	---	---	17.59	26.06
Cultivation	0.25	1	June	1.95	2.78	0.10	1.05	0.30	4.12	---	10.00

¹Fertilizer and pesticide costs include cost of custom application.

²Applied during an irrigation set.

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Table 3, cont. Carrot seed production under drip irrigation: Estimated resource use and costs for field operations.

Operation	Perf.	Times	Month	Tractor Cost		Equipment Cost		Labor		Operating	Total
	Rate	Over		Direct	Fixed	Direct	Fixed	Hours	\$	Input	Cost
	Hours/acre									\$	\$
Insect Control Through Drip Tape ²	---	1	June	---	---	---	---	0.24	1.91	6.93	---
Water	---	---	---	---	---	---	---	---	---	2.93	11.77
Hand Weed	---	1	June	---	---	---	---	1.00	8.00	---	8.00
Weed Control ¹	---	1	June	---	---	---	---	---	---	28.93	28.93
Insect Control ¹	---	1	June	---	---	---	---	---	---	56.54	56.54
Bees	---	1	June	---	---	---	---	---	---	164.00	164.00
Clean Drip Lines ²	---	1	June	---	---	---	---	0.43	3.44	0.06	---
Water	---	---	---	---	---	---	---	---	---	2.93	6.43
Insect Control ¹	---	---	July	---	---	---	---	---	---	38.24	38.24
Insect Control ¹	---	---	Aug	---	---	---	---	---	---	48.59	48.59
Roll Male Carrots	0.16	1	Aug	2.49	3.38	0.16	1.69	0.19	2.64	---	10.36
Hand Weed	---	1	Aug	---	---	---	---	1.00	8.00	---	8.00
Harvest	---	---	---	---	---	---	---	---	---	---	---
Swath	0.3	1	Sept	---	---	5.01	14.52	0.36	4.95	---	24.48
Combine w/ Pickup	0.5	1	Sept	---	---	17.88	63.38	0.61	8.25	---	89.51
Two 2-ton Trucks w/ Labor	---	---	---	---	---	0.06	0.65	---	---	---	0.71
Flame Carrot Residue	0.16	1	Sept	2.49	3.38	1.00	3.04	0.19	2.64	6.00	18.55
	---	---	---	---	---	---	---	---	---	---	---
	---	---	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	---	---	---	---	---	1,603.40
Interest on Operating Capital	---	---	---	---	---	---	---	---	---	---	60.44
Total Specified Cost	---	---	---	---	---	---	---	---	---	---	1,663.84

¹Fertilizer and pesticide costs include cost of custom application.

²Applied during an irrigation set.

Table 4. Self-propelled machines, tractors, and implements: Estimated performance rating, useful life, annual use, purchase price, repair cost, fuel consumption rating, and direct and fixed cost per hour and acre.

Item Name	Size	Perf. Rate	Useful Life	Annual Use	Purchase Price	Repair Cost	Fuel Cons. Rate	Direct Cost		Fixed Cost	
		Hours/ acre	Years	Hours	\$	Percent purchase price	Gallons/ hour	\$/hour	\$/acre	\$/hour	\$/acre
Combine w/ Pickup Swather	14 ft	0.50	20	100	120,000	40	7.59	35.76	17.88	126.76	63.38
Combine w/ Pickup Swather	12 ft	0.30	20	120	55,000	50	4.04	16.71	5.01	48.41	14.52
Combine w/ Pickup Swather	14 ft	1.00	20	100	120,000	40	7.50	33.75	33.75	122.07	122.07
Combine w/ Pickup Swather	12 ft	0.08	20	120	55,000	50	4.04	16.71	1.33	48.41	3.87
ATV	20 hp	0.03	10	200	5,600	100	1.38	4.93	0.16	3.99	0.13
2wd Cab Tractor	130 hp	----	20	400	87,000	100	6.57	19.41	----	22.97	----
2wd Cab Tractor	180 hp	----	20	500	125,000	80	9.10	21.83	----	26.40	----
2wd Tractor	50 hp	----	20	200	21,500	80	2.70	7.81	----	11.14	----
2wd Tractor	80 hp	----	20	300	60,000	100	4.30	15.59	----	21.12	----
Tractor w/ Loader	80 hp	----	25	100	60,000	50	1.00	13.30	----	59.66	----
Bedder Bar	12 ft	0.20	10	100	2,000	20	----	0.40	0.08	2.85	0.57
Carrot Roller	4 row	0.16	20	20	2,000	20	----	1.00	0.16	10.56	1.69
Chisel	10 ft	0.20	20	100	12,500	50	----	3.12	0.62	13.20	2.64
Cultimulcher	12 ft	0.10	20	100	12,000	40	----	2.40	0.24	12.67	1.26
Disk	15 ft	0.10	20	50	17,000	60	----	10.20	1.02	35.91	3.59
Electric Thinner	4 row	1.00	10	20	900	10	----	0.45	0.45	6.41	6.41
Flail Mower	15 ft	0.10	20	100	13,500	50	----	3.37	0.33	14.26	1.42
Flamer	30 ft	0.16	20	50	9,000	70	----	6.30	1.00	19.01	3.04
Flex Harrow	20 ft	0.08	25	100	10,000	50	----	2.00	0.16	9.94	0.79
Land Leveler	12 ft	0.16	20	25	10,000	50	----	10.00	1.60	42.25	6.76
Mint Planter	16 ft	0.50	25	20	7,500	20	----	3.00	1.50	36.71	18.35
Mint Rake	12 ft	0.01	20	20	5,000	25	----	3.12	0.03	26.40	0.26
Paper Roller	10 ft	0.50	20	20	2,000	20	----	1.00	0.50	10.56	5.28
Pasture Harrow	12 ft	0.08	20	100	1,000	50	----	0.25	0.02	1.05	0.08
Precision Planter	12.5 ft	0.20	20	75	5,000	50	----	1.66	0.33	7.04	1.40
Roller	12 ft	0.10	10	200	5,000	25	----	0.62	0.06	3.56	0.35
Rolling Cultivator	12 ft	0.25	20	50	2,000	20	----	0.40	0.10	4.22	1.05
Rototiller	10 ft	1.00	20	50	4,200	80	----	3.36	3.36	8.87	8.87
Row Sprayer	12.5 ft	0.20	20	75	13,000	70	----	6.06	1.21	18.31	3.66
Tool Bar w/ Shovels	12.5 ft	0.20	25	25	3,000	75	----	1.80	0.36	5.96	1.19