University of Idaho
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2013 Enterprise Budgets for Southwest Idaho: Costs & Returns Estimates for Peppermint Establishment & Production Gravity-fed Irrigation, with Fumigation

Kathleen Painter, Neil Rimbey, and Jerry Neufeld[1]

Budget spreadsheets are available at the following link:
http://www.cals.uidaho.edu/aers/r_crops.htm

[1]Painter is a farm and ranch management specialist in Moscow, Rimbey is a range economist located at the Caldwell R&E Center, Neufeld is an extension educator in Canyon County.

kpainter@uidaho.edu
nrimbey@uidaho.edu
jerryn@uidaho.edu

University of Idaho
PO Box 442334
Moscow ID 83844-2334
(208) 885-6041

Instructions and Assumptions for Using Enterprise Budgets and Cost Calculators

Color Coding:
A color coding system is used to indicate the source of the data for each budget and to show which data can be adjusted in the spreadsheet version of this report. Data with orange type can be changed without affecting the underlying equations in this cost calculator. Data with purple type are from the Summary sheet (Table 1). In the Summary sheet, crop price, crop yield, and years in full production have orange type. Adjusting any of those numbers will automatically update all calculations throughout the spreadsheet so you can quickly compare price and yield changes on net returns. Input prices can be easily updated by making changes in the green Input Prices sheet (Table 2). All calculations will again be updated throughout the spreadsheet. You will notice that data from the Input Prices tab appears in green ink on the Budget sheets. Machinery cost data appears in blue type. Please see below for more information on machinery cost calculations.

Input Prices:
By entering input prices on the Input Prices sheet, all of the cost calculations will be automatically updated in the spreadsheet version of this report. Input cost changes can also be made on individual crop price sheets, over-riding the input cost formula on that particular crop budget. Input costs are based on an annual survey of input suppliers for each region, as reported in the Idaho Crop Input Price Summaries, available online at http://web.cals.uidaho.edu/idahoagbiz/enterprise-budgets/

Crop Prices:
Crop prices can be adjusted on the Summary tab and the effects of this change will be reflected throughout all the budgets. (Yields can be adjusted similarly.) Crop prices are typically based on five-year average prices received by Idaho growers, with adjustments by region and for some contract crops.

Machinery Costs:
The machinery complement and associated hourly machinery cost data are in the last two tabs in the spreadsheet version (Tables 7 - 10). The per acre machinery cost data are used to create the individualized machinery cost data for each budget. In the crop budget sheets, entries in blue cells are calculated by the machinery cost program and come from the associated Machinery Cost table for that crop. Machinery fixed costs include depreciation, interest, property taxes, insurance, and housing. For the overall farm operation, these costs do not vary by crop, given the ownership of a specific machinery complement, and are incurred whether or not crops are grown. Your per acre fixed costs will change if the farm size differs significantly from the size used in these budgets.

Land Costs:
Land costs, included either as real or as opportunity costs, are based on a typical cash rent for this area. While the owner-operator will not actually experience a land rental cost, this cost represents the minimum return owner-operators must receive to justify growing the crop themselves. To determine the profitability of crop production relative to other activities, the owner-operator may want to consider these forgone rental returns along with the usual production expenses. Cash rent includes ownership costs for the irrigation system. Cash rent can be changed in the Input Prices sheet or on the individual budget sheets.

General Assumptions:
Since farming is inherently variable and constantly changing, we hope that this spreadsheet format will be helpful in adjusting these budgets to reflect your particular operation. Enterprise costs and returns vary from one location to the next and over time for any particular farming operation. Variability stems from differences in the following:

- Pest pressures, particularly for alfalfa seed production. Annual costs and returns will vary considerably depending on the pesticides needed for any specific year.
- Capital, labor, and natural resources
- Type and size of machinery complement
- Cultural practices
- Size of farm enterprise
- Crop yields
- Input prices
- Commodity prices
- Management skill

Background and Specific Assumptions:
Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for growing pepperming in southwestern Idaho.

Production practices most closely represent those in Ada and Canyon counties. Production practices may be similar among individual farms, but each has a unique set of resources with varying levels of productivity and production problems, and therefore, slightly different costs. Farm size, crop rotation, age and type of equipment, soils, and quality of management are crucial factors that influence production costs.

The Model Farm
This costs and returns estimate models a 1200-acre farm with 200 acres in peppermint. In addition to peppermint, the

farm grows 250 acres of potatoes or sugarbeets, 250 acres of corn, 250 acres of grain, and 250 acres of dry beans. Pepperming is kept in production for three years, then rotated into potatoes or sugarbeets the fourth year. The farm uses a concrete ditch and siphon irrigation system and surface water delivered from an irrigation district. The district charges a flat fee per acre for water.

Tillage, Fertilization, Pest Control, and Irrigation
Tillage costs are incurred only in the year alfalfa is established and are prorated along with other establishment costs over the alfalfa seed production years. This is approximately $47 per acre assuming three years of production, including the establishment year. This assumption can be altered in Table 6 and the amortized amount will be automatically adjusted. In this budget, alfalfa seed is planted in the fall following grain production (see Table 3 for more detail). Grain stubble is shredded with a flail then disced and plowed. At this point fertilizer is typically applied. The ground is then cultivated twice, followed by a landplane, a 6-row bedder, and a harrow operation. Alfalfa seed is planted in September using a tool bar with gandy boxes and a furrow. A post-emerge herbicide is typically applied in October. In the spring, herbicides are typically applied in April, May, June, and July. Lygus control is by means of three aerial pesticide applications in July and August. An aerial clean-up spray is applied in August, followed by defoliation via ground rig in September. The seed is then combined, followed by a flail shredder and a light disc. The stand is thinned using 12"-16" sweeps.

For alfalfa seed production, the field operations include the following (see Table 5 for more detail). A pre-emerge herbicide is typically applied in March. In April the ground is harrowed using a groundhog. In May a post-emerge herbicide is typically applied. The stand is clipped in May using a flail shredder. The ground is then corrugated. Ground-applied herbicides are typically used in June and July. Lygus control is accomplished by means of three aerial pesticide applications in July and August. An aerial clean-up spray is applied in August, followed by defoliation via ground rig in September. The seed is then combined, followed by a flail shredder and a light disc. The stand is thinned using 12"-16" sweeps.

In terms of irrigation system, the farm uses a concrete ditch and siphon tube irrigation system with water delivered to the farm from an irrigation district. The district charges a flat fee per acre for water. Peppermint receives about 52 inches of water during the growing season from 13 irrigations between April and September: 4 inches in April, 8 inches in May, 12 inches in June, 12 inches in July, 8 inches in August, and 8 inches in September.

Resources: Machinery, Land, Labor, and Capital
Table 7 lists the tractors, trucks, and other equipment used for alfalfa seed. Assumptions with respect to replacement and salvage values as well as years of life are based on recommendations from a panel of farmers, Extension and industry personnel as well as typical advertised values for used equipment. This information was used to construct per acre machinery costs and determine fuel usage based on output from the University of Idaho's machinery cost program as reported in Table 8. The data in Table 8 represent per acre costs for each operation, which is then used to construct Tables 9 and 10. These tables provide total per acre machinery ownership and operating costs. In the spreadsheet version of this bulletin, per acre machinery costs can be changed in Table 8 and Tables 9 and 10 will be automatically updated.

The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A labor charge is made for all labor pertaining to field operations and includes a base rate plus overhead expenses. Custom charges account for contracted field operations, such as aerial spraying. A management fee of 5% of gross revenue is charged under ownership costs.

Labor to operate machinery is valued at $16.25 per hour, while irrigation labor is valued at $11.55. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for general farm and truck driver labor, and 30 percent for irrigation and machinery labor.

Interest on operating capital is charged on total operating costs for nine months and calculated at a nominal rate of 6.75 percent. The operating interest rate can be changed on the Input Prices sheet in the spreadsheet version of this bulletin. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated costs such as office expenses, phone service, legal and accounting fees, and utilities.

Please examine closely the assumptions we have used and make adjustments to reflect your particular operation. Adjustments in the variable costs can easily be made without affecting the overall accuracy of the budget information. Machinery costs are more difficult to adjust, due to the underlying complexity of machinery cost calculations. A separate machinery cost calculator program is used to develop the costs used in these budgets, which are based on specific machinery widths, tractor horsepower, type of operation, etc. The machinery cost program and data sets specific to this budget are available upon request.

Acknowledgments:
I wish to thank everyone who helped gather all of the information needed to create these worksheets. First and foremost, I thank the farmers who were willing to take the time to share their enterprise information in order to create this worksheet. Without their assistance we would not be able to provide this critical information to others. However, I take responsibility for any errors in these budgets. Please feel free to contact me with any comments or suggestions.
Budget spreadsheets are available at the following link:
http://web.cals.uidaho.edu/idahoagbiz/enterprise-budgets/

Table 1. Summary of 2013 Estimates of Annual Returns for Peppermint Establishment and Full Production ($/acre), SW Idaho

	Mint Oil Yield (lb/ac)	Mint Oil Price ($/cwt)	Revenue per acre ($/acre)	Total Operating & Ownership Costs (TC) ($/acre)	Returns over Total Costs (TC) ($/acre)	Total Variable Costs (VC) ($/acre)	Returns over Variable Costs (VC) ($/acre)
Years of full production = 3							
Year 1: Baby Mint Production*	90	$22.00	$1,980	$2,259	**$0**	$1,792	$188
Years 2+ on: Mint, Full Production	110	$22.00	$2,420	$1,922	**$498**	$1,381	$1,039
Average Returns	105	$22.00	**$2,310**	**$2,006**	**$373**	**$1,484**	**$779**

Table 2. 2013 Input Price Assumptions for Establishing and Producing Peppermint, Southwest ID

Item	Unit	2013 Price/unit
Fuel:		
Diesel, offroad, bulk (gal)	gal	$3.60
Gas (gal)	gal	$3.70
Roots:		
Mint roots	acre	$250.00
Fertilizer:		
Nitrogen (dry)	lb	$0.66
Liquid urea (21-0-0)	gal	$2.43
Phosphorous (dry)	lb	$0.53
Potassium (dry)	lb	$0.50
Sulfur (dry)	lb	$0.25
Zinc	lb	$2.85
Boron	lb	$8.20
Micronutrients	lb	$22.00
Liquid sulfur (Super 6)	gal	$2.62
Custom Costs:		
Custom pesticide application, aerial	acre	$9.15
Custom ground sprayer	acre	$8.50
Custom fertilizer application, aerial	lb	$0.11
Custom fertilizer application, ground	acre	$8.00
Custom harvest & distillation	lb	$4.50
Custom fumigation	acre	$35.00
Pesticides & Adjuvants		
Basagran	pt	$12.50
Buctril 2EC	oz	$0.47
Chateau	oz	$5.84
Comite	qt	$22.21
Command	oz	$1.74
Coragen	oz	$6.00
Crop oil concentrate (COC)	qt	$3.66
Gramoxone	pt	$4.19
Intrepid	oz	$2.07
LI 700	oz	$0.30
Onager	oz	$2.35
Orthene	lb	$10.67
Poast	qt	$26.25

Table 2. 2013 Input Price Assumptions for Establishing and Producing Peppermint, Southwest ID

Item	Unit	2013 Price/unit
Prowl H2O	pt	**$5.72**
Quadris	oz	**$2.38**
Sinbar	lb	**$45.40**
Spartan 4F	oz	**$4.33**
Sticker	oz	**$0.23**
Stinger	oz	**$5.80**
Vapam	gal	**$5.55**
Volunteer	oz	**$0.94**
Labor[1]:		
Hourly machine labor	hour	**$17.80**
Truck driver labor	hour	**$13.80**
Hourly irrigation labor	hour	**$12.60**
Other labor	hour	**$10.25**
Interest:		
Operating Loan	percent	**5.75%**
Machinery Loan/investment	percent	6.00%
Miscellaneous:		
Cash rent	acre	**$250.00**
Marketing assessment	lb	**$0.065**
Overhead[2]	percent	**2.5%**
Management fee[3]	percent	**5.0%**

[1]Includes all applicable state and federal taxes.
[2]Covers legal, accounting, and utility fees. Calculated as percentage of operating expenses.
[3]Calculated as a percentage of gross revenue.

Table 3. Schedule of Operations for Baby Mint Following Grain, SW Idaho

No.	Month	Operation	Tooling	Materials/Service
1	Sept	Disc	145HP-WT, 15' offset disc	
2	Sept	Plow	145HP-WT, 4-bottom plow	
3	Oct	Seedbed prep	125HP-WT, 12' roller harrow	
4	Oct	Fertilize	Custom applied	Suggested fertilizer: 50 lb N, 75 lb P, 75 lb K, 50 lb S, 5 lb Zn, 2.8 lb B
5	Oct	Incorporate	125HP-WT, 16' triple-K	
6	Oct	Bed up	145HP-WT, 6-row corrugator	
7	Oct	Plant	145HP-WT, mint planter	
8	Oct	Haul roots	2 2-ton trucks	
9	Oct	Load planter	75HP-WT with loader	
10	Nov	Spray, ground	Self-propelled sprayer, 100' boom	l lb Sinbar, 8 oz Spartan, 8 oz Quadris
11	April	Harrow	125HP-WT, 20' spike harrow	
12	April	Furrow out	145HP-WT, 6-row corrugator	
13	1-May	Spray, ground	Self-propelled sprayer, 100' boom	1/2 lb Sinbar, 1 qt Basagran, 1 qt COC, 8 oz Buctril, 12 oz Volunteer
14	25-May	Spray, ground	Self-propelled sprayer, 100' boom	1/2 lb Sinbar, 1.5 pt Basagran, 1 qt COC
15	May	Water assessment		
16	June	Fertilize, custom	Custom applied	125 lb N
17	June	Hand weed	Custom	
18	July	Spray, aerial	Custom applied (aerial)	16 oz Onager, 8 oz Quadris, 14 oz Intrepid, 3.2 oz LI 700
19	July	Fertilizer	Custom applied (aerial)	125 lb N
20	August	Spray, aerial	Custom applied (aerial)	1 lb Orthene, 1 qt liquid sulfur (Super 8), 3.2 oz LI 700
21	August	Harvest & process	Custom	
22	Seasonal	Marketing assessment		
23	Seasonal	Irrigate	52" seasonally	52" seasonally (4" in April, 8" in May, 12" in June & July, 8" in Aug. & Sept.)

Table 4. Production Costs for Baby Mint Following Grain, SW Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Mint Oil	90	lb	$22.00	$1,980.00
Variable Costs				
Roots:				**$270.00**
Mint roots	1	acre	$240.00	$240.00
Transportation	1	acre	$30.00	$30.00
Fertilizer:				**$327.58**
Base your rate on your soil test results.				
A typical recommendation might include the following:				
Nitrogen (dry)	300	lb	$0.66	$198.00
Phosphorus (dry)	75	lb	$0.53	$39.75
Potassium (dry)	75	lb	$0.50	$37.50
Sulfur (dry)	50	lb	$0.25	$12.50
Boron	2.8	lb	$8.20	$22.96
Zinc	5	lb	$2.85	$14.25
Liquid sulfur (Super 6)	1	qt	$2.62	$2.62
Pesticides:				**$308.77**
Rates & chemicals will vary depending on pest pressure throughout the season.				
Consult a certified pesticide applicator or the PNW Pest Control Management Guides.				
The following cost estimates are typical:				
Spartan	8	oz	$4.33	$34.64
Sinbar	2	lb	$45.40	$90.80
Basagran	3.5	pt	$12.50	$43.75
Volunteer	12	oz	$0.94	$11.25
Buctril	8	oz	$0.47	$3.76
Crop oil concentrate (COC)	2	qt	$3.66	$7.32
Onager	16	oz	$2.35	$37.60
Quadris	16	oz	$2.38	$38.08
Intrepid	14	oz	$2.07	$28.98
LI 700	6.4	oz	$0.30	$1.92
Orthene	1	lb	$10.67	$10.67
Machinery:				**$115.90**
Fuel	10.79	gal	$3.60	$38.84
Lubricants	1	acre	$5.79	$5.79
Machinery Repairs	1	acre	$24.13	$24.13
Machinery Labor	2.65	hr	$17.80	$47.14
Custom & Consultants:				**$494.85**
Custom fumigate	1	acre	$35.00	$35.00
Custom pesticide application, aerial	2	acre	$11.05	$22.10
Custom fertilizer application, aerial	125	lb	$0.11	$13.75
Custom fertilizer application, ground	2	acre	$9.50	$19.00
Custom harvest & distillation	90	lb	$4.50	$405.00
Irrigation:				**$149.40**
Water Assessment	1	ac	$45.85	$45.85
Irrigation Repairs - Concrete Ditch system	1	ac	$2.75	$2.75
Irrigation Labor	8.00	hr	$12.60	$100.80

Table 4. Production Costs for Baby Mint Following Grain, SW Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Other:				**$79.35**
Crop insurance, multi-peril	1	acre	**$11.00**	$11.00
Marketing assessment	**90.00**	lb	**$0.065**	$5.85
Handweeding	1.00	ac	**$62.50**	$62.50
Operating Interest[1]				$45.90
Total Variable Costs				**$1,791.75**
Variable Costs per Unit				$19.91
Net Returns Above Variable Costs				**$188.25**
Ownership Costs:				
Machinery depreciation	1	ac	**$35.46**	$35.46
Machinery interest	1	ac	**$30.24**	$30.24
Machinery insur., housing, licenses	1	ac	**$12.52**	$12.52
Cash rent	1	ac	**$250.00**	$250.00
Overhead[2]	1	ac	**$39.91**	$39.91
Management fee[3]	1	ac	**$99.00**	$99.00
Total Fixed Costs				**$467.13**
Fixed Costs per Unit				$5.19
Total Costs per Acre				**$2,258.88**
Total Cost per Unit				$25.10
Returns to Risk				**-$278.88**

Notes:

[1]Calculated as 6.75% interest on operating capital for 6 months.

[2]Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

[3]The management fee is calculated as a 5% of gross revenue.

Note: Pesticide usage varies considerably by area and by year, which directly affects production costs and returns. These budgets reflect an attempt to construct a typical pest management strategy. You will need to adjust the budgets to reflect your situation.

Breakeven Analysis:

	- 10%	Base Yield	+ 10%
Price	81.0	90	99.0
Operating Cost Breakeven	$22.12	$19.91	$18.10
Ownership Cost Breakeven	$5.77	$5.19	$4.72
Total Cost Breakeven	$27.89	$25.10	$22.82

	- 10%	Base Price	+ 10%
Yield	$19.80	$22.00	$24.20
Operating Cost Breakeven	90.5	81.4	74.0
Ownership Cost Breakeven	23.6	21.2	19.3
Total Cost Breakeven	114.1	102.7	93.3

Table 5. Schedule of Operations for Mint Production, SW Idaho

No.	Month	Operation	Tooling	Materials/Service
1	Oct	Furrow out	145HP-WT, 6-row corrugator	
2	Dec	Dormant spray	Self-propelled sprayer, 100' boom	1 lb Sinbar, 4 oz Chateau, 1 qt Gramoxone, 6 oz Stinger, 1 pt Command, 1 qt sticker/100 gal, 3 gal 21-0-0
4	Apr	Split centers	145HP-WT, 5-row rotary corrugator	
5	May	Spray, ground	Self-propelled sprayer, 100' boom	8 oz Buctril, 1/2 lb Sinbar, 1 qt Basagran, 12 oz Volunteer, 1 qt crop oil concentrate
6	May	Fertilize	Custom applied (ground)	110 lb N
9	June	Fertilize	Custom applied (aerial)	110 lb N
10	June	Hand weed	Custom	1 hour @ $55 per acre
11	July	Pest control	Custom applied (aerial)	16 oz Onager, 8 oz Quadris, 14 oz Intrepid, 6.4 oz LI 700
12	July	Fertilize	Custom applied (aerial)	110 lb N
13	August	Pest control	Custom applied (aerial)	1 lb Orthene, 1 qt Super 8 (liquid sulfur), 6.4 oz LI 700 (spreader)
14	August	Custom harvest & process	Custom	$4.50 per lb
15	September	Spray, ground	Self-propelled sprayer, 100' boom	Coragen, 5 oz
17	Seasonal	Marketing assessment		
18	Seasonal	Irrigate		52" seasonally (4" in April, 8" in May, 12" in June & July, 8" in Aug. & Sept.)

Table 6. Production Costs for Mint Production, SW Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	
Gross Returns					
Mint Oil	110	lb	$22.00		$2,420.00
Variable Costs					
Fertilizer:				**$228.46**	
Base your rate on your soil test results.					
Nitrogen	330	lb	$0.66		$217.80
Sulfur	3	lb	$0.25		$0.75
Liquid urea (21-0-0)	3	gal	$2.43		$7.29
Liquid sulfur (Super 6)	1	qt	$2.62		$2.62
Pesticides:				**$320.34**	
Rates & chemicals will depend on the pests in your crop.					
Consult a certified pesticide applicator or the PNW Pest Control Management Guides.					
The following cost estimates are typical:					
Sinbar	1.5	lb	$45.40		$68.10
Chateau	4	oz	$5.84		$23.36
Gramoxone	1	pt	$4.19		$4.19
Stinger	6	oz	$5.80		$34.80
Command	16	oz	$1.74		$27.84
Sticker	3.2	oz	$0.23		$0.75
Buctril	8	oz	$0.47		$3.76
Basagran	1	qt	$12.50		$12.50
Volunteer	12	oz	$0.94		$11.25
Crop Oil Concentrate	1	qt	$3.66		$3.66
Onager	16	oz	$2.35		$37.60
Quadris	8	oz	$2.38		$19.04
Intrepid	14	oz	$2.07		$28.98
Orthene	1	lb	$10.67		$10.67
LI 700	12.8	oz	$0.30		$3.84
Coragen	5	oz	$6.00		$30.00
Machinery:				**$40.90**	
Fuel	4.03	gal	$3.60		$14.52
Lubricants	1	acre	$2.16		$2.16
Machinery Repairs	1	acre	$9.14		$9.14
Machinery Labor	0.85	acre	$17.80		$15.08
Custom & Consultants:				**$545.50**	
Custom pesticide application, aerial	2	acre	$9.15		$18.30
Custom fertilizer application, aerial	220	lb	$0.11		$24.20
Custom fertilizer application, ground	1	acre	$8.00		$8.00
Custom harvest & distillation	110	lb	$4.50		$495.00
Irrigation:				**$138.69**	
Water Assessment	1	ac	$45.85		$45.85
Irrigation Repairs	1	ac	$2.75		$2.75
Irrigation Labor	7.15	hr	$12.60		$90.09
Other:				**$56.07**	
Crop insurance	1	acre	$11.00		$11.00
Marketing assessment	1	ac	$0.065		$0.07
Handweeding	1	ac	$45.00		$45.00
Operating Interest[1]					$51.37
Total Variable Costs					**$1,381.33**
Net Returns Above Variable Costs					**$1,038.67**

Table 6. Production Costs for Mint Production, SW Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	ac	$12.73	$12.73
Machinery interest	1	ac	$13.79	$13.79
Machinery insur., housing, licenses	1	ac	$6.33	$6.33
Cash Rent	1	ac	$250.00	$250.00
Amortization of neg. carryover from ME costs**	7.50%	acre	($278.88)	$107.24
**Based on years of full production:	3			
Overhead[2]	1	ac	$29.78	$29.78
Management fee[3]	1	ac	$121.00	$121.00
Total Fixed Costs				**$540.87**
Total Costs per Acre				**$1,922.20**
Returns to Risk				**$497.80**

Notes:

[1]Calculated as interest on operating capital for 9 months.

[2]Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

[3]The management fee is calculated as a 5% of gross revenue.

Note: Pesticide usage varies considerably by area and by year, which directly affects production costs and returns. These budgets reflect an attempt to construct a typical pest management strategy. You will need to adjust the budgets to reflect your situation.

Breakeven Analysis:

	- 10%	Base Yield	+ 10%
Price	99.0	110.00	121.0
Operating Cost Breakeven	$13.95	$12.56	$11.42
Ownership Cost Breakeven	$5.46	$4.92	$4.47
Total Cost Breakeven	$19.42	$17.47	$15.89

	- 10%	Base Price	+ 10%
Yield	$19.80	$22.00	$24.20
Operating Cost Breakeven	69.76	62.79	57.08
Ownership Cost Breakeven	27.32	24.59	22.35
Total Cost Breakeven	97.08	87.37	79.43

Table 7. Machinery Complement for Mint Production, SW Idaho

Type of Machine	Replacement Value $	Age When Purchased	Years of Life	Annual Hours of Use	Salvage Value $	Annual Repairs (Materials & Labor) $	Gallons of Fuel/Hr.	Taxes, Housing, Insur., Licenses %	Acres per Hour
Tractors:									
145HP-WT	118,000	5	15	700	15,000	3,000	6.35	1.2	
125HP-WT	93,000	5	15	700	13,500	3,000	5.48	1.2	
75HP-WT with loader	55,000	5	15	300	25,000	1,000	3.28	1.2	
Equipment:									
4-Bottom Plow	12,000	5	20	50	1,000	500	4.6	0.6	2.78
12' Roller Harrow	24,000	5	15	40	2,000	500	4.6	0.6	6.98
16' Triple K cultivator/harrow	5,900	0	15	100	750	250	4.6	0.6	9.89
15' Offset Disc	22,000	0	15	150	1,500	500	4.6	0.6	8.73
6-Row Corrugator	6,000	0	15	120	1,200	500	4.6	0.6	5.82
5-Row Corrugator, rotary	9,000	0	12	50	3,000	500	4.6	0.6	4.65
20' Spike Harrow	1,760	0	15	40	200	50	4.6	0.6	14.42
16' Landplane	17,000	5	15	40	1,500	300	4.6	0.6	9.89
Mint planter	23,500	5	15	30	8,000	500	4.6	3.0	4.25
14' Swather									
100' Self-propelled sprayer	210,000	1	10	250	150,000	2,500	3	3.1	116.36
Trucks:				Miles/year:			MPG:		
Nurse Truck	11,000	15	15	2,000	1,000	800	8	10.1	
2-Ton Truck	20,000	5	15	2,000	3,000	2,000	6	10.1	
2-Ton Truck	20,000	5	15	2,000	3,000	2,000	6	10.1	
New 3/4-Ton Pickup	41,000	0	7	12,000	20,000	1,000	17	6.8	
Used 3/4-Ton Pickup	20,000	7	14	12,000	5,200	1,000	15	6.8	
ATV	7,150	0	10	300	2,000	100	1.2	1.2	

Note: Farm size is assumed to be 1200 acres for the purposes of machinery cost calculations.

Note: Assumptions for truck use allocated per acre on an annual base are: 7 mi/ac for pickups; 2 mi/ac for the nurse truck; and 0.5 mi/ac for the 2-ton truck.

Table 8. Machinery Costs Calculations from the University of Idaho Machinery Cost Program ($/acre)

	Fixed Costs ($/acre):				Variable Costs ($/acre):				Labor	Fuel Use	Total Cost
	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Total Fixed Costs	Repairs	Labor	Fuel	Lubricants	(hr/acre)	(gal/acre)	($/acre)
Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:											
ATV	$0.43	$0.26	$0.05	$0.74	$0.25	$4.47	$1.05	$0.16	0.25	0.29	$6.67
New 3/4-ton pickup	$1.75	$1.20	$1.21	$4.16	$0.58	$0.00	$1.44	$0.22	0.00	0.40	$6.40
Used 3/4-ton pickup	$1.23	$0.50	$0.50	$2.23	$0.58	$0.00	$1.63	$0.25	0.00	0.45	$4.69
Nurse truck	$0.67	$0.41	$0.41	$1.49	$0.80	$1.87	$0.88	$0.13	0.11	0.24	$5.17
2-ton truck	$0.28	$0.19	$0.29	$0.76	$0.50	$0.78	$0.29	$0.04	0.04	0.08	$2.37
2-ton truck	$0.28	$0.19	$0.29	$0.76	$0.50	$0.78	$0.29	$0.04	0.04	0.08	$2.37
Machinery costs for these implements are specific to the operations for each crop:											
145HP-WT + 4B plow	$5.40	$4.22	$0.54	$10.16	$5.13	$6.43	$7.99	$1.20	0.36	2.22	$30.91
145-HPWT + 6-row corrugator	$1.51	$1.14	$0.17	$2.82	$1.46	$3.07	$3.82	$0.57	0.17	1.06	$11.74
145-HPWT + 5-row rotary corrugator	$3.22	$2.81	$0.34	$6.37	$3.50	$3.84	$4.78	$0.72	0.22	1.33	$19.21
125HP-WT + 20' spike harrow	$0.50	$0.37	$0.06	$0.93	$0.39	$1.24	$1.33	$0.20	0.07	0.37	$4.09
125HP-WT + 16' triple K	$0.79	$0.59	$0.09	$1.47	$0.68	$1.81	$1.94	$0.29	0.10	0.54	$6.19
125HP-WT + 12' roller harrow	$4.59	$3.00	$0.31	$7.90	$2.40	$2.56	$2.75	$0.41	0.14	0.76	$16.02
145HP-WT + 15' offset disc	$1.56	$1.03	$0.14	$2.73	$0.87	$2.05	$2.55	$0.38	0.12	0.71	$8.58
145-HPWT + 6-row mint planter	$9.74	$9.50	$3.91	$23.15	$3.36	$10.41	$5.23	$0.78	0.58	1.45	$42.93
75HP-WT with loader	$0.88	$0.78	$0.14	$1.80	$0.33	$1.76	$1.13	$0.17	0.10	0.31	$5.19
2-ton truck for hauling rootstock	$1.13	$0.78	$1.16	$3.07	$2.00	$3.12	$1.17	$0.17	0.18	0.33	$9.53
2-ton truck for hauling rootstock	$1.13	$0.78	$1.16	$3.07	$2.00	$3.12	$1.17	$0.17	0.18	0.33	$9.53
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	0.01	0.03	$2.50

Note: In the spreadsheet version, per acre machinery costs can be changed in this master table and they will update throughout. Per acre costs are calculated in a separate machinery cost program using the values listed in the Machinery Complement tab.

Table 9. Machinery Costs for Baby Mint ($/acre) from the University of Idaho Machinery Cost Calculator

	Ownership Costs ($/acre):				Operating Costs ($/acre):				Labor	Fuel Use	
	Depre-ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Labor	Fuel	Lubricants	(hr/acre)	(gal/acre)	Total Cost ($/acre)
Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:											
ATV	$0.43	$0.26	$0.05	$0.74	$0.25	$4.47	$1.05	$0.16	$0.25	$0.29	$6.67
New 3/4-ton pickup	$1.75	$1.20	$1.21	$4.16	$0.58	$0.00	$1.44	$0.22	$0.00	$0.40	$6.40
Used 3/4-ton pickup	$1.23	$0.50	$0.50	$2.23	$0.58	$0.00	$1.63	$0.25	$0.00	$0.45	$4.69
Nurse truck	$0.67	$0.41	$0.41	$1.49	$0.80	$1.87	$0.88	$0.13	$0.11	$0.24	$5.17
2-ton truck	$0.28	$0.19	$0.29	$0.76	$0.50	$0.78	$0.29	$0.04	$0.04	$0.08	$2.37
2-ton truck	$0.28	$0.19	$0.29	$0.76	$0.50	$0.78	$0.29	$0.04	$0.04	$0.08	$2.37
Machinery costs for these implements are specific to the operations for each crop:											
145HP-WT + 15' offset disc	$1.56	$1.03	$0.14	$2.73	$0.87	$2.05	$2.55	$0.38	$0.12	$0.71	$8.58
145HP-WT + 4B plow	$5.40	$4.22	$0.54	$10.16	$5.13	$6.43	$7.99	$1.20	$0.36	$2.22	$30.91
125HP-WT + 12' roller harrow	$4.59	$3.00	$0.31	$7.90	$2.40	$2.56	$2.75	$0.41	$0.14	$0.76	$16.02
125HP-WT + 16' triple K	$0.79	$0.59	$0.09	$1.47	$0.68	$1.81	$1.94	$0.29	$0.10	$0.54	$6.19
145-HPWT + 6-row corrugator	$1.51	$1.14	$0.17	$2.82	$1.46	$3.07	$3.82	$0.57	$0.17	$1.06	$11.74
145-HPWT + 6-row mint planter	$9.74	$9.50	$3.91	$23.15	$3.36	$10.41	$5.23	$0.78	$0.58	$1.45	$42.93
75HP-WT with loader	$0.88	$0.78	$0.14	$1.80	$0.33	$1.76	$1.13	$0.17	$0.10	$0.31	$5.19
2-ton truck for hauling rootstock	$1.13	$0.78	$1.16	$3.07	$2.00	$3.12	$1.17	$0.17	$0.18	$0.33	$9.53
2-ton truck for hauling rootstock	$1.13	$0.78	$1.16	$3.07	$2.00	$3.12	$1.17	$0.17	$0.18	$0.33	$9.53
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
125HP-WT + 20' spike harrow	$0.50	$0.37	$0.06	$0.93	$0.39	$1.24	$1.33	$0.20	$0.07	$0.37	$4.09
145-HPWT + 6-row corrugator	$1.51	$1.14	$0.17	$2.82	$1.46	$3.07	$3.82	$0.57	$0.17	$1.06	$11.74
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Total:	**$35.46**	**$30.24**	**$12.52**	**$78.22**	**$24.13**	**$47.14**	**$38.84**	**$5.79**	**$2.65**	**$10.79**	**$194.12**

Table 10. Machinery Costs for SW ID Mint Production ($/acre) from the University of Idaho Machinery Cost Calculator

	Fixed Costs ($/acre):				Variable Costs ($/acre):				Labor	Fuel Use	Total Cost
	Deprecia-tion	Interest	Taxes, Housing, Insurance, Licenses	Total Fixed Costs	Repairs	Labor	Fuel	Lubricants	(hr/acre)	(gal/acre)	($/acre)
Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:											
ATV	$0.43	$0.26	$0.05	$0.74	$0.25	$4.47	$1.05	$0.16	$0.25	$0.29	$6.67
New 3/4-ton pickup	$1.75	$1.20	$1.21	$4.16	$0.58	$0.00	$1.44	$0.22	$0.00	$0.40	$6.40
Used 3/4-ton pickup	$1.23	$0.50	$0.50	$2.23	$0.58	$0.00	$1.63	$0.25	$0.00	$0.45	$4.69
Nurse truck	$0.67	$0.41	$0.41	$1.49	$0.80	$1.87	$0.88	$0.13	$0.11	$0.24	$5.17
2-ton truck	$0.28	$0.19	$0.29	$0.76	$0.50	$0.78	$0.29	$0.04	$0.04	$0.08	$2.37
Machinery costs for these implements are specific to the operations for each crop:											
145-HPWT + 5-row rotary corrugator	$3.22	$2.81	$0.34	$6.37	$3.50	$3.84	$4.78	$0.72	$0.22	$1.33	$19.21
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
145-HPWT + 6-row corrugator	$1.51	$1.14	$0.17	$2.82	$1.46	$3.07	$3.82	$0.57	$0.17	$1.06	$11.74
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Self-propelled sprayer, 100' boom	$0.52	$1.04	$0.48	$2.04	$0.21	$0.15	$0.09	$0.01	$0.01	$0.03	$2.50
Total:	**$12.73**	**$13.79**	**$6.33**	**$32.85**	**$9.14**	**$15.08**	**$14.52**	**$2.16**	**0.85**	**4.03**	**$73.75**