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<p>Farm Business Management Reports</p>		<p>EB1921E</p>
	<p>2001 Cost of Producing Peppermint under Rill and Central Pivot Irrigation Central Washington</p>	
	<p>Herbert R. Hinman</p>	
<p>COOPERATIVE EXTENSION  WASHINGTON STATE UNIVERSITY</p>	<p>Online at: http://farm.mngt.wsu.edu/</p>	

Note

Enterprise costs and returns vary from one farm to the next and over time for any particular farm. Variability stems from differences in the following:

- Capital, labor, and management resources
- Type and size of machinery complement
- Cultural practices
- Size of farm enterprise
- Crop yields
- Input prices
- Marketing program

Costs can also be calculated differently depending on the intended use of the cost estimate. The information in this publication serves as a general guide for a modern, well-managed irrigated crop farm in central Washington that produces peppermint as one of its enterprises. To avoid drawing unwarranted conclusions about any particular farm or group of farms, the reader must closely examine the assumptions used. If they are not appropriate for the situation at hand, adjustments in the costs and/or returns should be made.

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2001 COST OF PRODUCING PEPPERMINT UNDER RILL AND CENTER PIVOT IRRIGATION, CENTRAL WASHINGTON

Herbert R. Hinman*

INTRODUCTION

Washington State is the nation's second leading producer of peppermint oil. In 2000, 22,500 acres of peppermint were grown in central Washington. This acreage yielded 2,160,000 pounds of peppermint oil according to the National Agricultural Statistics Service, USDA. This study was undertaken to estimate the 2001 costs of establishing and producing peppermint grown under rill and center pivot irrigation, and peppermint prices required for an economically viable enterprise.

The enterprise data do not represent a particular farm. Instead, they represent costs under the assumptions adopted for the study. Use the blank spaces provided on the right-hand side of various budget tables to estimate your own costs. Extension faculty and private consultants can provide information on field operations and operating inputs.

SOURCES OF INFORMATION

A committee of area producers identified the field operations and machinery complement commonly used. These producers represented well-managed farms. Quantities and types of materials (plants, fertilizer, herbicides, insecticides, etc.) used in the budgets were based on recommended practices. Local farm suppliers provided price information on materials and other services commonly used by farmers. Machinery costs were based on typical annual hours of use, as described by the committee, and what growers would currently pay to replace their machinery complement (new and used).

BUDGET ASSUMPTIONS

The following assumptions were made in developing the enterprise data:

1. The farm is 1000 acres with approximately 400 acres in peppermint and 600 acres in other row crops.
2. Cost of establishment and production are calculated for 40-acre units on a per-acre basis for 40-acre units under rill irrigation and 125-acre units under center pivot irrigation.
3. The value of bare land is assumed to be \$3,500 per acre with property taxes of \$20 per acre. Rent for this land is \$150 per acre for rill irrigated land and \$250 per acre for center pivot irrigated land and is used in the budgets as a proxy for land ownership cost.

*Extension economist, Washington State University.

4. The center pivot irrigation system, designed for 125 acres, is included in the \$250 per acre land rent. In addition, electrical costs are \$55 per acre during the establishment year and \$65 per acre during full production years. Repairs are estimated at \$12 per acre.
5. Initial costs for a rill irrigation system with a 3-year life designed for 40 acres are:

120 tubes	\$ 430
10 dams	<u>\$ 240</u>
Total	\$ 670

There is no electricity cost for the gravity flow rill irrigation system.

6. The annual irrigation water charge is \$62 per acre for both rill and center pivot irrigation.
7. Peppermint has a 4-year life including the establishment year.
8. Estimated production for center pivot irrigated peppermint is 75 pounds of oil per acre during the establishment year and 130 pounds per acre for center pivot irrigation (65 pounds during the July harvest and 65 pounds during the September harvest) during each year of the remaining three production years. Estimated production for rill irrigated peppermint is 75 pounds per acre during the establishment year and 115 pounds each year during the remaining three producing years. These figures represent the past 5-year average production for peppermint in central Washington.
9. Price received for peppermint oil is estimated at \$9.50 per pound.
10. Interest on operating loans is assumed to be 10%. Return on alternative investments is assumed to be 10% and represents the opportunity cost of investments in machinery and irrigation equipment.

DISCUSSION OF BUDGET INFORMATION

Based on the above assumptions, full production costs per acre (which include the opportunity costs foregone from investments in land, irrigation equipment, machinery, operator labor and management) and the breakeven selling prices for peppermint grown under rill and center pivot irrigation were estimated to be the following:

	Establishment Year <u>Yield/Acre</u> Lbs.	Establishment Year <u>Cost/Acre</u> \$	Mature Year <u>Yield/Acre</u> Lbs.	Mature Year <u>Cost/Acre</u> ¹ \$	Breakeven <u>Price/Lb.</u> ² \$
Peppermint (Rill)	75	1,978.69	115	1,892.42	15.01
Peppermint (Center Pivot)	75	1,711.92	130	1,711.92	14.22

These relative high breakeven prices, when compared with prices currently being received for peppermint, have resulted in an all-time low in new peppermint plantings. However, due to the high cost of establishing peppermint fields, producers have been reluctant to pull out established plantings before the natural productive life has expired.

The difference in breakeven prices between rill irrigated peppermint and center pivot irrigated peppermint lies largely in the fact that most rill irrigated land must be fumigated at a cost of \$226 per acre before planting peppermint. Currently, most peppermint that is being grown under center pivot is being grown on ground that has not been previously used to grow peppermint and, therefore, need not be fumigated.

The complete detailed budget information is presented in the Appendix in two sets of tables. The various tables represent the following establishment and production costs:

RILL Tables. Establishment and production costs for peppermint grown under rill irrigation.

CP Tables. Establishment and production costs for peppermint grown under center pivot irrigation.

Each set contains six separate tables. A discussion of the information in each table is presented below.

Table 1. Schedule of Operations and Estimated Costs per Acre for Establishing a Peppermint Field.

Table 1 outlines the schedule of field operations by calendar month, the type of machinery and labor used, and the hours used per acre for the establishment year.

¹Cost based on receiving \$9.50 per pound for peppermint. This price helps determine the “net” establishment cost that must be amortized over the life of the “mature” crop.

²The price needed during the establishment year and the production years in order to cover all costs.

Field operation costs are divided into two categories. The first is the fixed cost of owning equipment and land. The second, variable costs, is associated with operating machinery, hiring labor, and purchasing services and materials. Total cost is the sum of fixed costs and variable costs.

Machinery and irrigation fixed costs include depreciation, interest on the average investment, property taxes, housing, and insurance. These costs are incurred whether or not a crop is grown and do not vary with acreage, given ownership of a specific equipment complement. Per-hour fixed costs for machinery are determined by dividing the total annual fixed cost per machine by the total annual hours of machinery use for the representative farm. Machinery fixed costs for a specific field operation are determined by multiplying the machine hours per acre times the machinery per-hour fixed costs (Table 8). Irrigation fixed costs per acre are determined by dividing the total annual irrigation fixed costs by the number of acres.

Land fixed costs include taxes and net rent that are based on rental agreements typical for the area, minus expenditures typically covered by the landowner. While an owner-operator obviously will not have a land rental cost, the cost represents the minimum returns the owner-operator must have from the land component to justify growing this crop. This net rental return represents the income the owner-operator foregoes by producing a crop on the land rather than renting it to a tenant. As a result of investing capital in land, the farmer receives both current returns from crop production activities and any long-term land value appreciation (depreciation). However, the farmer would continue to receive land value appreciation (depreciation) even if the land was rented out. Consequently, the appropriate land charge for growing this crop is only the net rent lost. As used in this publication, land cost is termed an opportunity cost to indicate that it is not an out-of-pocket expense. Rather, it is a return foregone by the producer who chooses to grow this crop.

An opportunity cost for management is also listed in Table 1. For management, a cost of \$50 per acre is used. This represents what the producer committee felt was a fair return to his or her management. Management is regarded as a fixed rather than a variable cost because the grower either uses management skills or loses them during the production year.

Variable costs depend on the number of acres produced. These costs include fuel, oil, repairs, fertilizer, chemicals, custom work, overhead (utilities, legal fees, accounting, services, etc.) and interest on operating capital. Custom application rates for fertilizer and other chemicals are included as variable costs and used as a proxy for both custom and operator applied chemical application costs. Hand labor and machinery operating labor are also included as variable costs.

Table 2. Materials or Services Applied per Acre by Operation for Establishing a Peppermint Field.

The "Service" and "Materials" columns in Table 1 are costs associated with services and materials used by different operations. Table 2 lists the specific type and quantity of services and/or materials used, by operations, as shown in Table 1.

Table 3. Itemized Costs per Acre for Establishing a Peppermint Field.

Table 3 itemizes costs in the schedule of operations (Table 1). Most items are self-explanatory. However, "Tractor Interest" and "Machinery Interest" warrant additional explanation. These figures represent opportunity costs. These are returns foregone by investing in the given equipment and irrigation complement rather than in alternative investments. Total interest cost on these capital purchases is calculated on the average annual value of the machinery and irrigation system over their respective years of use.

Table 4. Schedule of Operations and Estimated Costs per Acre for Producing Peppermint.

The schedule of field operations by calendar month, the type of machinery and labor used, and the hours used per acre for peppermint during the full production years are outlined in Table 4. This table does the same for the production years as Table 1 does for the establishment year. However, it includes an additional investment cost entitled "Amortized Net Establishment Cost."

The "Amortized Net Establishment Cost" represents establishment year costs, minus establishment year revenues, that must be recaptured during the remaining production years. For example, the costs during the establishment year for peppermint grown under rill irrigation total \$1,978.69. Revenues during this year, estimated at 75 pounds selling at \$9.50 per pound (the assumed price), are \$612.50, which leaves \$1,266.19 to be recaptured over the remaining five producing years if all costs are to be covered. Amortizing this cost over a 3-year period, using a 10% interest rate, means that \$509.15 of the establishment year loss needs to be added to mature year production costs each year.

Table 5. Materials or Services Applied per Acre by Operation for Producing Peppermint.

The "Service" column and the "Materials" column in Table 4 list dollar figures for services and materials used in different operations. Table 5 lists the specific services and/or materials used, by operation, as shown in Table 4.

Table 6. Itemized Costs per Acre for Producing Peppermint.

Costs in the schedule of operations for peppermint during the full production years are summarized in Table 6 in the same way that costs during establishment year are summarized in Table 3.

Table 7. Average Annual Profit (or Loss) per Acre for Peppermint at Different Price and Yield Levels and the Breakeven Price for the Given Yield Levels.

Table 7 shows the average annual profit (or loss) per acre that a producer would receive at different price and yield levels and the breakeven price for the given yield levels under the given assumptions of this study. Profits are returns over and above all costs associated with the enterprise including the opportunity costs of investments in land, irrigation equipment, machinery, and management. Failure to receive a profit means the owner-operator will not realize a return on capital and management contributions equivalent to what could be earned in an alternative use.

Realizing a profit means that, in addition to covering all cash and opportunity costs, the operator receives a return to the risk assumed in producing peppermint.

The remaining three tables, Tables 8, 9 and 10, contain information relevant to all budgets regardless of the variety of peppermint grown or the type of irrigation system.

Table 8. Equipment Complement.

Table 8 lists the type of machines used to produce peppermint plus, on a per-unit basis, their replacement value, years of life before trade-in, salvage value, hours of annual use, annual repair cost, fuel type (if applicable), and gallons of fuel used per hour. The same information is provided for the irrigation systems except the acreage supported by these assets is specified rather than annual hours of use.

Table 9. Hourly or per-Acre Equipment Costs.

Table 9 presents the estimated fixed and variable costs per hour of use for the machinery listed in Table 8. Costs are calculated on a per-acre basis for the irrigation systems.

Equipment fixed costs include depreciation, interest on investment, property taxes, and insurance. Equipment prices represent what growers would currently pay to replace their equipment. While this assumption may result in an overstatement of production costs currently experienced by producers, it provides an indication of the enterprise's ability to generate the earnings needed to replace depreciable assets. Continuing increases in prices paid for replacement machinery and equipment due to inflation and improved technology mean that depreciation claimed on assets purchased prior to price advances understates the amount of capital currently required for asset replacement. When an enterprise is evaluated to determine its long-run viability, it is important to consider its ability to replace depreciable assets on a replacement cost basis. Note that interest on investment represents a 10% opportunity cost to the enterprise. These are earnings foregone by investing in equipment rather than in the next best alternative investment. Equipment variable costs include repair, fuel, and lubrication costs – costs that vary with the crop grown or the number of acres produced.

Table 10. Prices for Selected Inputs.

Fuel, chemicals, and other input prices used to develop the budgets are listed in Table 10. An additional 10¢ per gallon has been added to the price of fuel to reflect fuel storage facility costs.

CONCLUDING NOTE

To use these budgets you should fully comprehend the procedures and assumptions used in this study and interpret the results accordingly. The author and producers who organized this data recognize that these budgets do not represent any one particular operation. They should be used as a general guide to help derive budgets for individual operations. Moreover, this publication does not recommend production practices. Rather, it presents current technology typically used to produce peppermint in central Washington.

APPENDIX
DETAILED BUDGET INFORMATION

TABLE 1RILL. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR ESTABLISHING A PEPPERMINT FIELD, FOLLOWING WHEAT, IN CENTRAL WASHINGTON: RILL IRRIGATION

OPERATION	TOOLING	MTH	YEAR	MACH HOURS	LABOR HOURS	VARIABLE COST						TOTAL VARIABLE COST	TOTAL COST
						TOTAL FIXED COST	FUEL, LUBE, & REPAIRS	LABOR	SERVICE	MATER.	INTER.		
RIP (2X)	180HP-WT, 7 SHANK RIPPER	FALL	2000	.67	.80	\$ 22.31	\$ 18.97	\$ 9.60	\$.00	\$.00	\$ 2.62	\$ 31.19	\$ 53.50
DISK(2X)	180HP-WT, 15' OFFSET DISK	FALL	2000	.33	.40	10.35	9.98	4.80	.00	.00	1.36	16.14	26.49
FUMIGATE	CUSTOM GROUND APPLICATOR	FALL	2000	.00	.00	.00	.00	.00	39.00	168.00	18.98	225.98	225.98
CHISEL PLOW	180HP-WT, 17' CHISEL PLOW	MAR	2001	.33	.40	11.23	9.48	4.80	.00	.00	.83	15.12	26.35
ROLL-HARROW(2X)	180HP-WT, 15' ROLLER-HARROW	MAR	2001	.50	.60	14.23	14.23	7.20	.00	.00	1.25	22.68	36.91
FERTILIZE (DRY)	CUSTOM GROUND APPLICATION	MAR	2001	.00	.00	.00	.00	.00	7.00	74.40	4.75	86.15	86.15
APPLY HERBICIDE	CUSTOM GROUND APPLICATION	MAR	2001	.00	.00	.00	.00	.00	8.65	31.00	2.31	41.96	41.96
DISC	180HP-WT, 15' OFFSET DISC	MAR	2001	.17	.20	5.18	4.99	2.40	.00	.00	.43	7.82	13.00
MARK-OUT	180HP-WT W/TOOLBAR	MAR	2001	.17	.20	4.40	3.49	2.40	.00	.00	.34	6.24	10.64
PLANT	CUSTOM PLANT	MAR	2001	.00	.00	.00	.00	.00	100.00	250.00	20.42	370.42	370.42
CULT. & DITCH	100HP-WT, 5-ROW CULTIVATOR	APR	2001	.20	.24	3.46	2.93	2.88	.00	.00	.29	6.10	9.56
BUILD DRAIN	100HP-WT, BLADE	APR	2001	.04	.04	.66	.46	.54	.00	.00	.05	1.05	1.72
IRRIGATE(12X)	RILL IRRIGATION, 36 AC.IN.	APR-OCT	2001	.00	7.50	6.42	2.50	67.50	62.00	.00	3.30	135.30	141.72
FERTIGATION	THROUGH IRRIGATION SYSTEM	APR-AUG	2001	.00	.00	.00	.00	.00	.00	103.68	3.46	107.14	107.14
APPLY P.A.M.	FISH FEEDER	APR-JUN	2001	.00	.00	2.08	.13	.00	.00	9.40	.40	9.92	12.00
APPLY HERBICIDE	CUSTOM GROUND APPLICATION	APR	2001	.00	.00	.00	.00	.00	8.65	33.25	2.10	43.99	43.99
SPRAY	FIELD BORDERS	MAY-OCT	2001	.00	.00	.00	.00	.00	7.00	.00	.18	7.18	7.18
CULT. & DITCH	100HP-WT, 5-ROW CULTIVATOR	MAY	2001	.20	.24	3.46	2.93	2.88	.00	.00	.24	6.05	9.51
APPLY INSECT.	AERIAL APPLICATION	JUN	2001	.00	.00	.00	.00	.00	8.50	25.51	1.13	35.14	35.14
WEEDING	HAND WEEDING	JUL	2001	.00	.00	.00	.00	.00	35.00	.00	.88	30.88	30.88
HARVEST&PROCESS.	CUSTOM HARVEST & PROCESSING	AUG	2001	.00	.00	.00	.00	.00	262.50	.00	4.38	266.87	266.87
ASSESSMENT	MARKETING	SEP	2001	.00	.00	.00	.00	.00	3.75	.00	.03	3.78	3.78
RESIDUE DISPOSAL	CUSTOM DISPOSAL	SEP	2001	.00	.00	.00	.00	.00	15.00	.00	.12	15.12	15.12
CULT. & DITCH	100HP-WT, 5-ROW CULTIVATOR	SEP	2001	.20	.24	3.46	2.93	2.88	.00	.00	.05	5.86	9.31
MISC. USE	LABOR'S PICKUP	ANN	2001	1.80	1.98	5.53	13.56	17.82	.00	.00	1.57	32.95	38.47
MISC USE	MANAGER'S 3/4 TON PICKUP	ANN	2001	1.60	.00	11.03	10.88	.00	.00	.00	.54	11.43	22.46
MISC USE	4-WHEEL ATV	ANN	2001	.25	.28	.47	.34	2.47	.00	.00	.14	2.96	3.43
OVERHEAD	UTILITIES,LEGAL,ACCTG.,ETC.	ANN	2001	.00	.00	.00	.00	.00	124.03	.00	.00	124.03	124.03
TAXES	LAND	ANN	2001	.00	.00	20.00	.00	.00	.00	.00	.00	.00	20.00
LAND COST	NET RENT	ANN	2001	.00	.00	130.00	.00	.00	.00	.00	.00	.00	130.00
MANAGEMENT	MANAGEMENT CHARGE	ANN	2001	.00	.00	50.00	.00	.00	.00	.00	.00	.00	50.00
TOTAL PER ACRE				6.45	13.12	304.26	97.81	128.17	681.08	695.24	72.13	1674.43	1978.69

TABLE 2Rill. Materials or Services Applied per Acre by Operation for Establishing a Peppermint Field in central Washington: Rill Irrigation

Operation	Material or Services Applied
Fumigate (Fall)	Custom application (\$39.00 per acre) 40 gal. of Vapam (\$4.20 per gallon)
Fertilize-Dry (March)	Custom ground application (\$7.00 per acre) 100 lbs. nitrogen (\$.36 per lb.) 80 lbs. phosphate (\$.25 per lb.) 80 lbs. potash (\$.17 per lb.) 40 lbs. sulfur (\$.12 per lb.)
Spray (March)	Custom ground application (\$8.65) 1 lb. Sinbar (\$31.00 per lb.)
Plant (March)	Custom plant (\$100.00 per acre) Peppermint roots (\$250.00 per acre)
Irrigate (April-October)	Irrigation charge (\$62.00 per acre)
Fertigate (April-August)	240 lbs. nitrogen (\$.42 per lb.) 24 lbs. sulfur (\$.12 per lb.)
Apply P.A.M. (April-June)	4 lbs. P.A.M. (\$2.35 per lb.)
Apply Herbicide (April)	Custom ground application (\$8.65 per acre) 1 lb. Sinbar (\$31.00 per lb.) 1 qt. crop oil (\$9.00 per gal.)
Spray (May-October)	Field border spray (\$7.00 per acre)
Apply Insecticide (June)	Aerial application (\$8.50 per acre) 1.25 qts. Comite (\$19.08 per qt.) 3.2 oz. Nutra-Buffer (\$.08 per oz.) 2 lbs. sulfur (\$.70 per lb.)
Weed (July)	Hand weed (\$35.00 per acre)
Harvest & Process (August)	Custom harvest & processing (75 lbs. per acre @ 3.50 per lb.)
Assessment (September)	Market assessment (75 lbs. per acre @ \$.05 per lb.)
Residue Disposal (September)	Custom disposal (\$15.00 per acre)
Overhead (Annual)	8% variable cost

TABLE 3RILL. ITEMIZED COSTS PER ACRE FOR ESTABLISHING A PEPPERMINT FIELD, FOLLOWING WHEAT, IN CENTRAL WASHINGTON: RILL IRRIGATION

		PRICE OR		VALUE OR	YOUR
	UNIT	COST/UNIT	QUANTITY	COST	FARM

VARIABLE COSTS		\$		\$	
CUSTOM FUMIGATION	ACRE	39.00	1.00	39.00	_____
VAPAM	GAL.	4.20	40.00	168.00	_____
DRY FERT APPLICATION	ACRE	7.00	1.00	7.00	_____
NITROGEN	LB.	.36	100.00	36.00	_____
PHOSPHATE	LB.	.25	80.00	20.00	_____
SULFUR	LB.	.12	40.00	4.80	_____
POTASH	LB.	.17	80.00	13.60	_____
CUSTOM SPRAY APPLIC.	ACRE	8.65	2.00	17.30	_____
SINBAR	LB.	31.00	2.00	62.00	_____
CROP OIL	GAL.	9.00	.25	2.25	_____
PLANTING	ACRE	100.00	1.00	100.00	_____
PEPPERMINT PLANTS	ACRE	250.00	1.00	250.00	_____
IRRIGATION CHARGE	ACRE	62.00	1.00	62.00	_____
P.A.M.	LB.	2.35	4.00	9.40	_____
NITROGEN (LIQ)	LB.	.42	240.00	100.80	_____
SULFUR	LB.	.12	24.00	2.88	_____
AERIAL APPLICATION	ACRE	8.50	1.00	8.50	_____
COMITE	QT.	19.08	1.25	23.85	_____
NUTRA-BUFFER	OZ.	.08	3.20	.26	_____
SULFUR (MILDEW)	LB.	.70	2.00	1.40	_____
BORDER SPRAY	ACRE	7.00	1.00	7.00	_____
HARVEST & PROCESSING	LB.	3.50	75.00	262.50	_____
RESIDUE DISPOSAL	ACRE	15.00	1.00	15.00	_____
MARKET ASSESSMENT	LB.	.05	75.00	3.75	_____
HAND WEED	ACRE	35.00	1.00	35.00	_____
HAND LABOR	HOURL	9.00	9.76	87.79	_____
LABOR (TRAC/MACH)	HOURL	12.00	3.37	40.38	_____
TRACTOR REPAIR	ACRE	20.07	1.00	20.07	_____
TRACTOR FUEL/LUBE	ACRE	32.96	1.00	32.96	_____
MACHINERY REPAIRS	ACRE	24.59	1.00	24.59	_____
MACHINE FUEL/LUBE	ACRE	20.19	1.00	20.19	_____
OVERHEAD	ACRE	124.03	1.00	124.03	_____
INTEREST ON OP. CAP.	ACRE	72.13	1.00	72.13	_____

TOTAL VARIABLE COST				1674.43	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	22.69	1.00	22.69	_____
TRACTOR INTEREST	ACRE	33.27	1.00	33.27	_____
TRACTOR INSURANCE	ACRE	2.00	1.00	2.00	_____
TRACTOR TAXES	ACRE	5.99	1.00	5.99	_____
TRACTOR HOUSING	ACRE	3.33	1.00	3.33	_____
MACHINE DEPRECIATION	ACRE	19.25	1.00	19.25	_____
MACHINE INTEREST	ACRE	13.48	1.00	13.48	_____
MACHINE INSURANCE	ACRE	.76	1.00	.76	_____
MACHINE TAXES	ACRE	2.27	1.00	2.27	_____
MACHINE HOUSING	ACRE	1.24	1.00	1.24	_____
MANAGEMENT CHARGE	ACRE	50.00	1.00	50.00	_____
NET LAND RENT	ACRE	130.00	1.00	130.00	_____
LAND TAXES	ACRE	20.00	1.00	20.00	_____

TOTAL FIXED COST				304.26	_____
TOTAL COST				1978.69	_____

TABLE 4RILL. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING PEPPERMINT IN CENTRAL WASHINGTON: RILL IRRIGATION

		VARIABLE COST											
OPERATION	TOOLING	MTH	YEAR	MACH HOURS	LABOR HOURS	TOTAL FIXED COST	FUEL, LUBE, & REPAIRS	MACH LABOR	SERVICE	MATER.	INTER.	TOTAL VARIABLE COST	TOTAL COST
						\$	\$	\$	\$	\$	\$	\$	\$
FERTILIZE (DRY)	CUSTOM GROUND APPLICATION	FALL	2000	.00	.00	.00	.00	.00	7.00	39.00	4.22	50.22	50.22
APPLY HERBICIDE	CUSTOM GROUND APPLICATION	FEB	2001	.00	.00	.00	.00	.00	8.65	60.14	4.59	73.38	73.38
FERTILIZE (DRY)	CUSTOM GROUND APPLICATION	MAR	2001	.00	.00	.00	.00	.00	7.00	60.00	3.91	70.91	70.91
CULT. & DITCH	100HP-WT, 5-ROW CULTIVATOR	APR	2001	.20	.24	3.46	2.93	2.88	.00	.00	.29	6.10	9.56
BUILD DRAIN	100HP-WT, BLADE	APR	2001	.04	.04	.66	.46	.54	.00	.00	.05	1.05	1.72
IRRIGATE(12X)	RILL IRRIGATION, 36 AC.IN.	APR-OCT	2001	.00	7.50	6.42	2.50	67.50	62.00	.00	3.30	135.30	141.72
FERTIGATE (LIQ)	THROUGH THE IRRIG. SYSTEM	APR-AUG	2001	.00	.00	.00	.00	.00	129.60	.00	3.24	132.84	132.84
SPRAY	FIELD BORDERS	MAY-OCT	2001	.00	.00	.00	.00	.00	7.00	.00	.18	7.18	7.18
SPOT SPRAY	4-WHEEL ATV W/SPRAYER	MAY	2001	.25	.30	.72	.39	2.70	.00	2.25	.22	5.56	6.28
APPLY INSECT.	AERIAL APPLICATION	MAY	2001	.00	.00	.00	.00	.00	8.50	25.25	1.41	35.16	35.16
APPLY INSECT.	AERIAL APPLICATION	JUL	2001	.00	.00	.00	.00	.00	8.50	36.44	1.12	46.06	46.06
HARVEST&PROCESS	CUSTOM HARVEST AND PROCESSING	AUG	2001	.00	.00	.00	.00	.00	402.50	.00	6.71	409.21	409.21
DITCH	100HP-WT, 5-ROW ROTARY DITCHER	AUG	2001	.33	.40	5.86	4.60	4.80	.00	.00	.16	9.56	15.42
ASSESSMENT	MARKETING	SEP	2001	.00	.00	.00	.00	.00	5.75	.00	.05	5.80	5.80
ROOT BOAR CONT.*	THROUGH THE IRRIGATION SYSTEM	SEP	2001	.00	.00	.00	.00	.00	2.88	5.42	.07	8.37	8.37
RESIDUE DISP.	CUSTOM DISPOSAL	OCT	2001	.00	.00	.00	.00	.00	20.00	.00	.00	20.00	20.00
MISC. USE	LABOR'S PICKUP	ANN	2001	1.80	1.98	5.53	13.56	17.82	.00	.00	1.57	32.95	38.47
MISC. USE	MANAGER'S 3/4 TON PICKUP	ANN	2001	1.60	.00	11.03	10.88	.00	.00	.00	.54	11.43	22.46
MISC. USE	4-WHEEL ATV	ANN	2001	.25	.28	.47	.34	2.47	.00	.00	.14	2.96	3.43
TAXES	LAND	ANN	2001	.00	.00	20.00	.00	.00	.00	.00	.00	.00	20.00
LAND COST	NET RENT	ANN	2001	.00	.00	130.00	.00	.00	.00	.00	.00	.00	130.00
OVERHEAD	UTILITIES,LEGAL,ACCTG.,ETC.	ANN	2001	.00	.00	.00	.00	.00	85.12	.00	.00	85.12	85.12
MANAGEMENT	MANAGEMENT CHARGE	ANN	2001	.00	.00	50.00	.00	.00	.00	.00	.00	.00	50.00
INVESTMENT	AMORTIZED NET ESTAB. COST	ANN	2001	.00	.00	509.15	.00	.00	.00	.00	.00	.00	509.15
TOTAL PER ACRE				5.47	10.74	743.30	35.67	98.71	624.90	358.09	31.75	1149.12	1892.42

*APPLIED THE END OF THE SECOND PRODUCTION YEAR. IN THIS BUDGET THE COST IS ALLOCATED 1/3 PER YEAR.

TABLE 5RILL: Materials or Services Applied per Acre by Operation for
Producing Peppermint in central Washington: Rill Irrigation

Operation	Material or Services Applied
Fertilize (Fall)	Custom ground application (\$7.00 per acre) 50 lbs. nitrogen (\$.36 per lb.) 50 lbs. phosphate (\$.25 per lb.) 50 lbs. potash (\$.17 per lb.)
Apply Herbicide (February)	Custom ground application (\$8.65 per acre) 3 pts. Prowl (\$2.63 per pint) 2 pts. Gramoxone (\$4.00 per pint) .50 lb. Sinbar (\$31.00 per lb.) 2.5 pts Goal (\$11.50 per pint)
Fertilize (March)	Custom ground application (\$7.00 per acre) 100 lbs. nitrogen (\$.36 per lb.) 50 lbs. phosphate (\$.25 per lb.) 50 lbs. potash (\$.17 per lb.) 25 lbs. sulfur (\$.12 per lb.)
Irrigate (April–October)	Irrigation charge (\$62.00 per acre)
Fertigate (April–August)	Custom ground application (\$8.65 per acre) 300 lbs. nitrogen (\$.42 per lb.) 30 lbs. sulfur (\$.12 per lb.)
Spray (May–October)	Field border spray (\$7.00 per acre)
Spot Spray (May)	1 oz. Stinger (\$4.49 per oz.)
Apply Insecticide (May)	Aerial application (\$8.50 per acre) 1.25 qts. Comite (\$19.08 per qt.) 2 lbs. sulfur (\$.70 per lb.)
Apply Insecticide (July)	Aerial application (\$8.50 per acre) 1 qt. Comite (\$19.08 per qt.) 1.33 lbs. Orthene (\$12.00 per lb.) 2 lbs. sulfur (\$.70 per lb.)
Harvest & Processing (August)	Custom harvest & processing (115 lbs./acre @ \$3.50/lb.)
Assessment (September)	Market assessment (115 lbs. per acre @ \$.05 per lb.)
Root Borer Control (September) ¹	.5 gal. Lorsban 4E (\$32.50 per gal.)
Residue Disposal (October)	Custom disposal (\$20.00 per acre)
Overhead (Annual)	8% variable cost

¹Applied only once during the three production years.

TABLE 6RILL. ITEMIZED COSTS PER ACRE FOR PRODUCING PEPPERMINT IN
CENTRAL WASHINGTON: RILL IRRIGATION

		PRICE OR		VALUE OR	YOUR
		UNIT COST/UNIT	QUANTITY	COST	FARM

VARIABLE COSTS		\$		\$	
DRY FERT. APPLICATION	ACRE	7.00	2.00	14.00	_____
NITROGEN	LB.	.36	150.00	54.00	_____
PHOSPHATE	LB.	.25	100.00	25.00	_____
POTASH	LB.	.17	100.00	17.00	_____
SULFUR	LB.	.12	25.00	3.00	_____
CUSTOM SPRAY APPLIC.	ACRE	8.65	1.33	11.53	_____
PROWL	PINT	2.63	3.00	7.89	_____
GRAMOXONE	PINT	4.00	2.00	8.00	_____
SINBAR	LB.	31.00	.50	15.50	_____
GOAL	PINT	11.50	2.50	28.75	_____
LORSBAN 4E	GAL.	32.50	.17	5.42	_____
AERIAL APPLICATION	ACRE	8.50	2.00	17.00	_____
COMITE	QT.	19.08	2.25	42.93	_____
ORTHENE	LB.	12.00	1.33	15.96	_____
SULFUR (MILDEW)	LB.	.70	4.00	2.80	_____
STINGER	OZ.	4.49	.50	2.25	_____
IRRIGATION CHARGE	ACRE	62.00	1.00	62.00	_____
NITROGEN (LIQ)	LB.	.42	300.00	126.00	_____
SULFUR	ACRE	.12	30.00	3.60	_____
BORDER SPRAY	ACRE	7.00	1.00	7.00	_____
HARVEST & PROCESSING	LB.	3.50	115.00	402.50	_____
MARKET ASSESSMENT	LB.	.05	115.00	5.75	_____
RESIDUE DISPOSAL	ACRE	20.00	1.00	20.00	_____
HAND LABOR	ACRE	9.00	10.06	90.49	_____
LABOR (TRAC/MACH)	ACRE	12.00	.68	8.22	_____
TRACTOR REPAIR	ACRE	3.52	1.00	3.52	_____
TRACTOR FUEL/LUBE	ACRE	3.66	1.00	3.66	_____
MACHINERY REPAIRS	ACRE	8.31	1.00	8.31	_____
MACHINE FUEL/LUBE	ACRE	20.19	1.00	20.19	_____
OVERHEAD	ACRE	85.12	1.00	85.12	_____
INTEREST ON OP. CAP.	ACRE	31.75	1.00	31.75	_____

TOTAL VARIABLE COST				1149.12	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	3.05	1.00	3.05	_____
TRACTOR INTEREST	ACRE	4.77	1.00	4.77	_____
TRACTOR INSURANCE	ACRE	.29	1.00	.29	_____
TRACTOR TAXES	ACRE	.86	1.00	.86	_____
TRACTOR HOUSING	ACRE	.48	1.00	.48	_____
MACHINE DEPRECIATION	ACRE	14.66	1.00	14.66	_____
MACHINE INTEREST	ACRE	7.71	1.00	7.71	_____
MACHINE INSURANCE	ACRE	.41	1.00	.41	_____
MACHINE TAXES	ACRE	1.24	1.00	1.24	_____
MACHINE HOUSING	ACRE	.69	1.00	.69	_____
MANAGEMENT CHG.	ACRE	50.00	1.00	50.00	_____
AMORT NET ESTAB COST	ACRE	509.15	1.00	509.15	_____
NET LAND RENT	ACRE	130.00	1.00	130.00	_____
LAND TAXES	ACRE	20.00	1.00	20.00	_____

TOTAL FIXED COST				743.30	_____
TOTAL COST				1892.42	_____

Table 7RILL: AVERAGE ANNUAL PROFIT (OR LOSS)¹ PER ACRE FOR PEPPERMINT GROWN UNDER RILL IRRIGATION AT DIFFERENT PRICE AND YIELD LEVELS AND THE BREAKEVEN PRICE FOR THE GIVEN YIELD LEVELS.

		PRICE PER POUND							
FIRST YEAR YIELD	MATURE YEAR YIELD ²	\$9.00	\$10.00	\$11.00	\$12.00	\$13.00	\$14.00	\$15.00	BREAKEVEN PRICE
LBS.	LBS.	\$	\$	\$	\$	\$	\$	\$	\$
-----ANNUAL PROFIT-----									
75	105	-926	-791	-656	-521	-386	-251	-115	15.85
75	110	-899	-759	-619	-479	-339	-199	-59	15.42
75	115	-873	-727	-582	-437	-292	-147	-2	15.01
75	120	-846	-695	-545	-395	-245	-95	55	14.63
75	125	-819	-663	-508	-353	-198	-43	112	14.28
75	130	-792	-631	-471	-311	-151	9	169	13.94
75	135	-765	-600	-434	-269	-104	61	226	13.63

¹RETURNS OVER ALL VARIABLE AND FIXED COSTS LISTED IN TABLE 6RILL.

²THREE YEARS OF MATURE YIELD.

TABLE 1CP. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE COST PER ACRE FOR ESTABLISHING A PEPPERMINT FIELD, FOLLOWING WHEAT, IN CENTRAL WASHINGTON: CENTER PIVOT IRRIGATION

OPERATION	TOOLING	MTH	YEAR	MACH HOURS	LABOR HOURS	TOTAL FIXED COST	VARIABLE COST					TOTAL VARIABLE COST	TOTAL COST
							FUEL, LUBE, & REPAIRS	LABOR	SERVICE	MATER.	INTER.		
						\$	\$	\$	\$	\$	\$	\$	\$
DISK	180HP-WT, 15' OFFSET DISK	MAR	2001	.17	.20	5.18	4.99	2.40	.00	.00	.43	7.82	13.00
RIP	180HP-WT, 7 SHANK RIPPER	MAR	2001	.33	.40	11.15	9.48	4.80	.00	.00	.83	15.12	26.27
FERTILIZE (DRY)	CUSTOM GROUND APPLICATION	MAR	2001	.00	.00	.00	.00	.00	7.00	74.40	4.75	86.15	86.15
DISK	180HP-WT, 15' OFFSET DISK	MAR	2001	.17	.20	5.18	4.99	2.40	.00	.00	.43	7.82	13.00
MARK-OUT	180HP-WT W/TOOLBAR	MAR	2001	.17	.20	4.40	3.49	2.40	.00	.00	.34	6.24	10.64
PLANT	CUSTOM PLANT	MAR	2001	.00	.00	.00	.00	.00	100.00	250.00	20.42	370.42	370.42
DIKE	CUSTOM HIRED	MAR	2001	.00	.00	.00	.00	.00	20.00	.00	1.17	21.17	21.17
IRRIGATE	CENTER PIVOT, 20 ACRE IN.	APR-OCT	2001	.00	1.00	.00	12.00	9.00	117.00	.00	3.45	141.45	141.45
FERTIGATE	THROUGH THE IRRIG. SYSTEM	APR-AUG	2001	.00	.00	.00	.00	.00	.00	103.68	3.46	107.14	107.14
SPRAY	FIELD BORDERS	MAY-OCT	2001	.00	.00	.00	.00	.00	7.00	.00	.18	7.18	7.18
APPLY HERBICIDE	CUSTOM GROUND APPLICATION	MAY	2001	.00	.00	.00	.00	.00	8.50	70.75	3.30	82.55	82.55
WEED	HAND WEEDING	JUN	2001	.00	.00	.00	.00	.00	25.00	.00	.83	25.83	25.83
APPLY INSECT.	AERIAL APPLICATION	AUG	2001	.00	.00	.00	.00	.00	8.50	41.21	.83	50.54	50.54
HARVEST&PROCESS.	CUSTOM HARVEST & PROCESSING	AUG	2001	.00	.00	.00	.00	.00	262.50	.00	4.38	266.87	266.87
ASSESSMENT	MARKETING	SEP	2001	.00	.00	.00	.00	.00	3.75	.00	.03	3.78	3.78
RESIDUE DISPOSAL	CUSTOM DISPOSAL	SEP	2001	.00	.00	.00	.00	.00	20.00	.00	.17	20.17	20.17
MISC. USE	LABOR'S PICKUP	ANN	2001	1.80	1.98	5.53	13.56	17.82	.00	.00	1.57	32.95	38.47
MISC USE	MANAGER'S 3/4 TON PICKUP	ANN	2001	1.60	.00	11.03	10.88	.00	.00	.00	.54	11.43	22.46
MISC USE	4-WHEEL ATV	ANN	2001	.25	.28	.47	.34	2.47	.00	.00	.14	2.96	3.43
OVERHEAD	UTILITIES,LEGAL,ACCTG.,ETC.	ANN	2001	.00	.00	.00	.00	.00	101.41	.00	.00	101.41	101.41
LAND COST	LAND RENT	ANN	2001	.00	.00	250.00	.00	.00	.00	.00	.00	.00	250.00
MANAGEMENT	MANAGEMENT CHARGE	ANN	2001	.00	.00	50.00	.00	.00	.00	.00	.00	.00	50.00
TOTAL PER ACRE				4.48	4.26	342.94	59.75	41.29	680.66	540.04	47.24	1368.98	1711.92

TABLE 2CP. Materials or Services Applied per Acre by Operation for Establishing a Peppermint Field in central Washington: Center Pivot Irrigation

Operation	Material or Services Applied
Fertilize-Dry (March)	Custom ground application (\$7.00 per acre) 100 lbs. nitrogen (\$.36 per lb.) 80 lbs. phosphate (\$.25 per lb.) 80 lbs. potash (\$.17 per lb.) 40 lbs. sulfur (\$.12 per lb.)
Plant (March)	Custom plant (\$100.00 per acre) Peppermint roots (\$250.00 per acre)
Irrigate (April–October)	Irrigation charge (\$62.00 per acre) Electrical charge (\$55.00 per acre)
Fertigate (April–August)	240 lbs. nitrogen (\$.42 per lb.) 24 lbs. sulfur (\$.12 per lb.)
Spray (May–October)	Field border spray (\$7.00 per acre)
Apply Herbicide (May)	Custom ground application (\$8.65 per acre) 1 lb. Sinbar (\$31.00 per lb.) 1 qt. Poast (\$18.75 per pint) 1 qt. crop oil (\$9.00 per gal.)
Weed (June)	Hand weeding (\$25.00 per acre)
Apply Insecticide (August)	Aerial application (\$8.50 per acre) 1.25 qts. Comite (\$19.08 per qt.) 1.33 lbs. Orthene (\$12.00 per lb.) 2 lbs. sulfur (\$.70 per lb.)
Harvest & Process (August)	Custom harvest & processing (75 lbs. per acre @ 3.50 per lb.)
Assessment (September)	Market assessment (75 lbs. per acre @ \$.05 per lb.)
Residue Disposal (September)	Custom disposal (\$20.00 per acre)
Overhead (Annual)	8% variable cost

TABLE 3CP. ITEMIZED COSTS PER ACRE FOR ESTABLISHING A PEPPERMINT FIELD, FOLLOWING WHEAT, IN CENTRAL WASHINGTON: CENTER PIVOT IRRIGATION

		PRICE OR		VALUE OR	YOUR
	UNIT	COST/UNIT	QUANTITY	COST	FARM

VARIABLE COSTS		\$		\$	
DRY FERT APPLICATION	ACRE	7.00	1.00	7.00	_____
NITROGEN	LB.	.36	100.00	36.00	_____
PHOSPHATE	LB.	.25	80.00	20.00	_____
SULFUR	LB.	.12	64.00	7.78	_____
POTASH	LB.	.17	80.00	13.60	_____
NITROGEN (LIQ)	LB.	.42	240.00	100.80	_____
CUSTOM DIKING	ACRE	20.00	1.00	20.00	_____
CUSTOM PLANTING	ACRE	100.00	1.00	100.00	_____
PEPPERMINT PLANTS	ACRE	250.00	1.00	250.00	_____
AERIAL APPLICATION	ACRE	8.50	2.00	17.00	_____
SINBAR	LB.	31.00	1.00	31.00	_____
CROP OIL	GAL.	9.00	.25	2.25	_____
POAST	PINT	18.75	2.00	37.50	_____
COMITE	QT.	19.08	1.25	23.85	_____
ORTHENE	LB.	12.00	1.33	15.96	_____
SULFUR (MILDEW)	LB.	.70	2.00	1.40	_____
BORDER SPRAY	ACRE	7.00	1.00	7.00	_____
HARVEST & PROCESS	LB.	3.50	75.00	262.50	_____
MARKET ASSESSMENT	LB.	.05	75.00	3.75	_____
RESIDUE DISPOSAL	ACRE	20.00	1.00	20.00	_____
HAND WEEDING	ACRE	25.00	1.00	25.00	_____
HAND LABOR	HOURL	9.00	3.26	29.29	_____
LABOR (TRAC/MACH)	HOURL	12.00	1.00	12.00	_____
IRRIGATION REPAIRS	ACRE	12.00	1.00	12.00	_____
IRRIGATION CHARGE	ACRE	62.00	1.00	62.00	_____
ELECTRICITY	ACRE	55.00	1.00	55.00	_____
TRACTOR REPAIR	ACRE	6.25	1.00	6.25	_____
TRACTOR FUEL/LUBE	ACRE	11.21	1.00	11.21	_____
MACHINERY REPAIRS	ACRE	10.10	1.00	10.10	_____
MACHINE FUEL/LUBE	ACRE	20.19	1.00	20.19	_____
OVERHEAD	ACRE	101.41	1.00	101.41	_____
INTEREST ON OP. CAP.	ACRE	47.24	1.00	47.24	_____

TOTAL VARIABLE COST				1368.98	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	7.50	1.00	7.50	_____
TRACTOR INTEREST	ACRE	10.83	1.00	10.83	_____
TRACTOR INSURANCE	ACRE	.65	1.00	.65	_____
TRACTOR TAXES	ACRE	1.95	1.00	1.95	_____
TRACTOR HOUSING	ACRE	1.08	1.00	1.08	_____
MACHINE DEPRECIATION	ACRE	9.47	1.00	9.47	_____
MACHINE INTEREST	ACRE	8.55	1.00	8.55	_____
MACHINE INSURANCE	ACRE	.51	1.00	.51	_____
MACHINE TAXES	ACRE	1.54	1.00	1.54	_____
MACHINE HOUSING	ACRE	.85	1.00	.85	_____
LAND RENT	ACRE	250.00	1.00	250.00	_____
MANAGEMENT CHARGE	ACRE	50.00	1.00	50.00	_____

TOTAL FIXED COST				342.94	_____
TOTAL COST				1711.92	_____

TABLE 4CP. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING PEPPERMINT IN CENTRAL WASHINGTON: CENTER PIVOT IRRIGATION

OPERATION	TOOLING	MTH	YEAR	MACH HOURS	LABOR HOURS	TOTAL FIXED COST	VARIABLE COST					TOTAL VARIABLE COST	TOTAL COST
							FUEL, LUBE, & REPAIRS	LABOR	SERVICE MATER.	INTER.	TOTAL		
							\$	\$	\$	\$	\$	\$	\$
APPLY HERBICIDE	CUSTOM GROUND APPLICATION	FEB	2001	.00	.00	.00	.00	.00	8.65	37.14	3.05	48.84	48.84
FERTILIZE (DRY)	CUSTOM GROUND APPLICATION	MAR	2001	.00	.00	.00	.00	.00	7.00	74.40	4.75	86.15	86.15
IRRIGATE	CENTER PIVOT, 30 AC. IN.	APR-OCT	2001	.00	1.00	.00	12.00	9.00	127.00	.00	3.70	151.70	151.70
FERTIGATE (LIQ)	THROUGH THE IRRIG. SYSTEM	APR-AUG	2001	.00	.00	.00	.00	.00	.00	56.16	1.40	57.56	57.56
SPRAY	FIELD BORDERS	MAY-OCT	2001	.00	.00	.00	.00	.00	7.00	.00	.18	7.18	7.18
SPOT SPRAY	4-WHEEL ATV W/SPRAYER	MAY	2001	.25	.30	.72	.39	2.70	.00	2.25	.22	5.56	6.28
APPLY INSECT.	AERIAL APPLICATION	MAY	2001	.00	.00	.00	.00	.00	8.50	41.21	2.07	51.78	51.78
APPLY HERBICIDE	CUSTOM GROUND APPLICATION	JUN	2001	.00	.00	.00	.00	.00	8.65	72.75	2.71	84.11	84.11
HARVEST&PROCESS	CUSTOM HARVEST AND PROCESS	JUL	2001	.00	.00	.00	.00	.00	227.50	.00	5.69	233.19	233.19
FERTILIZE (DRY)	CUSTOM GROUND APPLICATION	JUL	2001	.00	.00	.00	.00	.00	7.00	36.00	1.08	44.08	44.08
APPLY HERBICIDE	CUSTOM GROUND APPLICATION	AUG	2001	.00	.00	.00	.00	.00	8.65	51.50	1.00	61.15	61.15
APPLY INSECT.	AERIAL APPLICATION	AUG	2001	.00	.00	.00	.00	.00	8.50	25.25	.56	34.31	34.31
HARVEST&PROCESS	CUSTOM HARVEST & PROCESS	SEP	2001	.00	.00	.00	.00	.00	227.50	.00	1.90	229.40	229.40
ASSESSMENT	MARKETING	SEP	2001	.00	.00	.00	.00	.00	6.50	.00	.05	6.55	6.55
ROOT BOAR CONT.*	THROUGH THE IRRIGATION SYSTEM	SEP	2001	.00	.00	.00	.00	.00	2.88	5.42	.07	8.37	8.37
RESIDUE DISPOSAL	CUSTOM DISPOSAL	OCT	2001	.00	.00	.00	.00	.00	20.00	.00	.00	20.00	20.00
MISC. USE	LABOR'S PICKUP	ANN	2001	1.80	1.98	5.53	13.56	17.82	.00	.00	1.57	32.95	38.47
MISC. USE	MANAGER'S 3/4 TON PICKUP	ANN	2001	1.60	.00	11.03	10.88	.00	.00	.00	.54	11.43	22.46
MISC. USE	4-WHEEL ATV	ANN	2001	.25	.28	.47	.34	2.47	.00	.00	.14	2.96	3.43
OVERHEAD	UTILITIES, LEGAL, ACCTG., ETC.	ANN	2001	.00	.00	.00	.00	.00	94.18	.00	.00	94.18	94.18
LAND COST	LAND RENT	ANN	2001	.00	.00	250.00	.00	.00	.00	.00	.00	.00	250.00
MANAGEMENT	MANAGEMENT CHARGE	ANN	2001	.00	.00	50.00	.00	.00	.00	.00	.00	.00	50.00
INVESTMENT	AMORTIZED NET ESTABLISHMT COST	ANN	2001	.00	.00	401.88	.00	.00	.00	.00	.00	.00	401.88
TOTAL PER ACRE				3.90	3.56	719.62	37.18	31.99	769.52	402.07	30.69	1271.45	1991.07

*APPLIED THE END OF THE SECOND PRODUCTION YEAR. IN THIS BUDGET THE COST IS ALLOCATED 1/3 PER YEAR.

TABLE 5CP: Materials or Services Applied per Acre by Operation for Producing Peppermint in central Washington: Center Pivot Irrigation

Operation	Material or Services Applied
Apply Herbicide (February)	Custom ground application (\$8.65 per acre) 3.0 pts. Prowl (\$2.63 per pint) 1.5 pts. Gramoxone (\$4.01 per pint) .75 lb. Sinbar (\$31.00 per lb.)
Fertilize (March)	Custom ground application (\$7.00 per acre) 100 lbs. nitrogen (\$.36 per lb.) 80 lbs. phosphate (\$.25 per lb.) 80 lbs. potash (\$.17 per lb.) 40 lbs. sulfur (\$.12 per lb.)
Irrigate (April–October)	Irrigation charge (\$62.00 per acre) Electrical charge (\$65.00 per acre)
(April–August)	Fertigate 130 lbs. nitrogen (\$.42 per lb.) 13 lbs. sulfur (\$.12 per lb.)
Border Spray (May–October)	Field border spray (\$7.00 per acre)
Spot Spray (May)	.5 oz. Stinger (\$4.49 per oz.)
Apply Insecticide (May)	Aerial application (\$8.50 per acre) 1.25 qts. Comite (\$19.08 per qt.) 1.33 lbs. Orthene (\$12.00 per lb.) 2.00 lbs. sulfur (\$0.70 per lb.)
Apply Herbicide (June)	Custom ground application (\$8.65 per acre) 1 qt. Poast (\$18.75 per pint) 1 qt. crop oil (\$9.00 per gal.) 2 qt. Basagran (\$16.50 per qt.)
Harvest & Processing (July)	Custom harvest and processing (65 lbs. per acre @ \$3.50 per lb.)
Fertilize (July)	Custom ground application (\$7.00 per acre) 100 lbs. nitrogen (\$.36 per lb.)
Apply Herbicide (August)	Custom ground application (\$8.65 per acre) 1 qt. Poast (\$18.75 per pint) 1 qt. Tough (\$14.00 per quart)
Apply Insecticide (August)	Aerial application (\$8.50 per acre) 1.25 qts. Comite (\$19.08 per qt.) 2.0 lbs. sulfur (\$.70 per lb.)
Harvest & Processing (Sept.)	Custom harvest and processing (65 lbs. per acre @ \$3.50 per lb.)
Assessment (September)	Market assessment (130 lbs./ac. @ \$.05 per lb.)
Root Borer Control (September) ¹	.5 gal. Lorsban 4E (\$32.50 per gal.)
Residue Disposal (October)	Custom disposal (\$20.00 per acre)
Overhead (Annual)	8% variable cost

¹Applied only once during the three production years.

TABLE 6CP. ITEMIZED COSTS PER ACRE FOR PRODUCING PEPPERMINT IN
CENTRAL WASHINGTON: CENTER PIVOT IRRIGATION

		PRICE OR		VALUE OR	YOUR
	UNIT	COST/UNIT	QUANTITY	COST	FARM

VARIABLE COSTS		\$		\$	
CUSTOM APPLICATION	ACRE	8.65	3.33	28.83	_____
PROWL	PINT	2.63	3.00	7.89	_____
GRAMOXONE	PINT	4.00	1.50	6.00	_____
SINBAR	LB.	31.00	.75	23.25	_____
POAST	PINT	18.75	4.00	75.00	_____
CROP OIL	GAL.	9.00	.25	2.25	_____
BASAGRAN	QT.	16.50	2.00	33.00	_____
TOUGH	QT.	14.00	1.00	14.00	_____
LORSBAN 4E	GAL.	32.50	.17	5.42	_____
DRY FERT APPLICATION	ACRE	7.00	2.00	14.00	_____
NITROGEN	LB.	.36	200.00	72.00	_____
SULFUR	LB.	.12	53.00	6.36	_____
PHOSPHATE	LB.	.25	80.00	20.00	_____
POTASH	LB.	.17	80.00	13.60	_____
AERIAL APPLICATION	ACRE	8.50	1.00	8.50	_____
COMITE	QT.	19.08	2.50	47.70	_____
SULFUR (MILDEW)	LB.	.70	4.00	2.80	_____
ORTHENE	LB.	12.00	1.33	15.96	_____
STINGER	OZ.	4.49	.50	2.25	_____
NITROGEN (LIQ)	LB.	.42	130.00	54.60	_____
BORDER SPRAY	ACRE	7.00	1.00	7.00	_____
HARVEST & PROCESS	LB.	3.50	130.00	455.50	_____
MARKET ASSESSMENT	LB.	.05	130.00	6.50	_____
RESIDUE DISPOSAL	ACRE	20.00	1.00	20.00	_____
HAND LABOR	HOURL	9.00	3.56	31.99	_____
IRRIGATION REPAIRS	ACRE	12.00	1.00	12.00	_____
IRRIGATION CHARGE	ACRE	62.00	1.00	62.00	_____
ELECTRICITY	ACRE	65.00	1.00	65.00	_____
TRACTOR REPAIR	ACRE	.10	1.00	.10	_____
TRACTOR FUEL/LUBE	ACRE	.24	1.00	.24	_____
MACHINERY REPAIRS	ACRE	4.65	1.00	4.65	_____
MACHINE FUEL/LUBE	ACRE	20.19	1.00	20.19	_____
OVERHEAD	ACRE	94.18	1.00	94.18	_____
INTEREST ON OP. CAP.	ACRE	30.69	1.00	30.69	_____

TOTAL VARIABLE COST				1271.45	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	.20	1.00	.20	_____
TRACTOR INTEREST	ACRE	.20	1.00	.20	_____
TRACTOR INSURANCE	ACRE	.01	1.00	.01	_____
TRACTOR TAXES	ACRE	.04	1.00	.04	_____
TRACTOR HOUSING	ACRE	.02	1.00	.02	_____
MACHINE DEPRECIATION	ACRE	8.60	1.00	8.60	_____
MACHINE INTEREST	ACRE	6.48	1.00	6.48	_____
MACHINE INSURANCE	ACRE	.39	1.00	.39	_____
MACHINE TAXES	ACRE	1.17	1.00	1.17	_____
MACHINE HOUSING	ACRE	.65	1.00	.65	_____
LAND RENT	ACRE	250.00	1.00	250.00	_____
AMORT NET ESTAB COST	ACRE	401.88	1.00	401.88	_____
MANAGEMENT CHARGE	ACRE	50.00	1.00	50.00	_____

TOTAL FIXED COST				719.62	_____
TOTAL COST				1991.07	_____

Table 7CP: AVERAGE ANNUAL PROFIT (OR LOSS)¹ PER ACRE FOR PEPPERMINT GROWN UNDER CENTER PIVOT IRRIGATION AT DIFFERENT PRICE AND YIELD LEVELS AND THE BREAKEVEN PRICE FOR THE GIVEN YIELD LEVELS.

		PRICE PER POUND							
FIRST YEAR YIELD	MATURE YEAR YIELD ²	\$9.00	\$10.00	\$11.00	\$12.00	\$13.00	\$14.00	\$15.00	BREAKEVEN PRICE
LBS.	LBS.	\$	\$	\$	\$	\$	\$	\$	\$
-----ANNUAL PROFIT-----									
75	115	-917	-772	-627	-482	-336	-191	-46	15.32
75	120	-890	-740	-590	-440	-289	-139	11	14.93
75	125	-863	-708	-553	-398	-242	-87	68	14.56
75	130	-836	-676	-516	-356	-196	-35	125	14.22
75	135	-809	-644	-479	-314	-149	17	182	13.90
75	140	-782	-612	-442	-272	-102	69	239	13.60
75	145	-755	-580	-405	-230	-55	120	296	13.31

¹RETURNS OVER ALL VARIABLE AND FIXED COSTS LISTED IN TABLE 6CP.

²THREE YEARS OF MATURE YIELD.

TABLE 8. EQUIPMENT COMPLEMENT

Description	Replacement Value	Years of Life	Salvage Value	Annual Hours of Use	Annual Repair	Fuel Type	Gallons per Hour
	\$		\$		\$		
180HP-WHEEL TRACTOR	110,000	20	20,000	500	3,750	Diesel	9.0
100HP-WHEEL TRACTOR	65,000	20	15,000	500	3,000	Diesel	4.0
15' ROLLER-HARROW	3,500	20	0	200	1,500		
15' OFFSET DISC	7,500	20	3,000	200	1,800		
7-SHANK RIPPER	4,600	20	1,500	80	600		
5-ROW CULTIVATOR	2,000	20	0	150	400		
17' CHISEL	12,000	20	3,000	200	1,500		
5-ROW ROTARY DITCHER	3,500	10	700	300	550		
BLADE	750	15	150	50	15		
4-WHEEL ATV	3,500	15	500	250	100	Gas	0.5
ATV SPRAYER	300	10	0	50	10		
3/4 TON PICKUP	30,000	6	15,000	800	750	Gas	3.0
LABOR PICKUP	15,000	8	2,000	900	1500	Gas	3.0
				<u>Acreage Covered</u>			
RILL IRRIGATION	670	3	0	40	100		
FISH FEEDER	210	3	0	40	5		

TABLE 9. HOURLY MACHINERY COSTS

MACHINERY	PURCHASE PRICE	YEARS TO TRADE	ANNUAL HOURS	DEPRECIATION	INTEREST	INSURANCE	TAXES	HOUSING	TOTAL FIXED COST	REPAIR	FUEL AND LUBE	TOTAL VARIABLE COST	TOTAL COST
	\$								-----COST PER HOUR-----				
WH. TRAC.- 180HP	110,000.00	20	500	9.00	13.00	.78	2.34	1.30	26.42	7.50	13.46	20.96	47.38
WH. TRAC.- 100HP	65,000.00	20	500	5.00	8.00	.48	1.44	.80	15.72	6.00	5.98	11.98	27.70
15' ROLLER HARROW	3,500.00	20	200	.88	.88	.05	.16	.09	2.05	7.50	.00	7.50	9.55
15' OFFSET DISC	7,500.00	20	200	1.13	2.63	.16	.47	.26	4.64	9.00	.00	9.00	13.64
7 SHANK RIPPER	4,600.00	20	80	1.94	3.81	.23	.69	.38	7.05	7.50	.00	7.50	14.55
5R CULTIVATOR	2,000.00	20	150	.67	.67	.04	.12	.07	1.56	2.67	.00	2.67	4.23
17' CHISEL	12,000.00	20	200	2.25	3.75	.23	.68	.38	7.28	7.50	.00	7.50	14.78
5R ROTARY DITCHER	3,500.00	10	300	.93	.70	.04	.13	.07	1.87	1.83	.00	1.83	3.70
BLADE	750.00	15	50	.80	.90	.05	.16	.09	2.01	.30	.00	.30	2.31
4-WHEEL ATV	3,500.00	15	250	.80	.80	.05	.14	.08	1.87	.40	.98	1.38	3.25
ATV SPRAYER	300.00	10	50	.60	.30	.02	.05	.03	1.00	.20	.00	.20	1.20
LABOR PICKUP	15,000.00	8	900	1.81	.94	.06	.17	.09	3.07	1.67	5.87	7.53	10.60
3/4 TON PICKUP	30,000.00	6	800	3.13	2.81	.17	.51	.28	6.89	.94	5.87	6.80	13.70
									-----COST PER ACRE-----				
RILL IRRIGATION	670.00	3	-	5.58	.84	.00	.00	.00	6.42	2.50	.00	2.50	8.92
FISH FEEDER	210.00	3	-	1.75	.26	.02	.05	.00	2.08	.13	.00	.13	2.20

TABLE 10. Prices for Selected Inputs.

Input	Price per Unit
Chemicals:	\$
Nitrogen (dry)	.36/lb.
Nitrogen (liq.)	.42/lb.
Phosphate	.25/lb.
Sulfur	.12/lb.
Potash	.17/lb.
Zinc	1.23/lb.
Sulfur (mildew control)	.70/lb.
Sinbar	31.00/lb.
Comite	19.08/qt.
Vapam	4.20/gal.
Lorsban 4E	32.50/gal.
Prowl	2.63/pint
Gramoxone	4.01/pint
Poast	18.75/pint
Crop Oil	9.00/gal.
Orthene	12.00/lb.
Assure II	1.04/oz.
Stinger	4.49/oz.
Goal	11.50/pint
Nutra-Buffer	.08/oz.
Surfix	.20/oz.
P.A.M.	2.35/lb.
Tough	14.00/qt.
Basagran	16.50/qt.
Services:	
Custom fertilizer (dry) application	7.00/acre
Custom ground (liquid) application	8.65/acre
Custom aerial application	8.50/acre
Custom planting of peppermint roots	100.00/acre
Custom harvesting and processing	3.50/lb.
Irrigation charge	62.00/acre
Electrical charge (establishment year)	55.00/acre
Electrical charge (production year)	65.00/acre
Other:	
Hand labor	9.00/hour
Machine labor	12.00/hour
Hand weeding	25.00 - 30.00/acre
Diesel fuel	1.30/gal ¹
Gasoline	1.70/gal ¹
Market assessment	.05/lb.
Peppermint roots	250.00/acre

¹ Fuel prices include an additional \$.10 per gallon to reflect fuel storage costs.

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is violation of law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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