


Farm Business Management Reports		EB1830
	1997 Hand- Harvest Cucumber Costs and Returns, Northwest Washington	
	Richard Carkner Riley Moore Wilbur Anderson Dyvon Havens	
COOPERATIVE EXTENSION Washington State  University		

Foreword

Enterprise costs and returns vary from one farm to the next, and over time, for any particular farm. This variability stems from differences in valuation of owned capital, labor, and management resources; type, size, and age of the machinery complement; cultural practices; size of farm and enterprise; crop yields; and input and commodity prices. Also, costs can be calculated differently, depending on the intended use of the cost estimate.

The land charge in this budget is based on cash rents prevailing in the area. Land rents vary considerably, depending on circumstances such as whether the lease is annual or multi-year, the crop, crop rotation restrictions, and previous crop history.

Overhead costs can also vary considerably from farm to farm. Overhead costs are those difficult to assign to a particular enterprise. They typically include utilities, licenses, taxes, insurance, professional services, utility vehicles such as pickups and ground maintenance equipment, organizational fees and dues, labor recruitment expense, office expenses, and the maintenance and operation of a farm shop. These costs need to be assigned to individual crop enterprises based on acres, relative labor requirements, or some other means. Overhead costs tend to increase as the crop mix becomes more labor intensive and the number of commodities produced increases.

The enterprise information presented here serves as a general guide for a typical Northwest Washington farm in 1997. To prevent drawing unwarranted conclusions about costs and returns for any particular farm or group of farms, the reader is urged to closely examine the assumptions used here. If these assumptions are not appropriate for the situation at hand, adjustments in the costs and/or return information will be necessary.

NOTE: The pesticide programs outlined are not official Washington State University recommendations, but they are typical of programs actually used by growers in the area.

Acknowledgments

The authors acknowledge all individuals who contributed to the development of this enterprise budget. Appreciation is expressed to the producers who provided information on practices used. Appreciation also is expressed to the farm supply and equipment dealers, custom operators, and chemical companies who provided prices for items used in production. Finally, a special thanks to Cheryl Steele, Washington State University Cooperative Extension Staff Secretary, whose help made this report possible.

1997 Hand-Harvest Cucumber Costs and Returns, Northwest Washington

by

Richard Carkner, Riley Moore, Wilbur Anderson, and Dyvon Havens¹

This publication outlines costs and returns for hand-harvest cucumbers in Northwest Washington. This crop is commonly grown in rotation with other vegetable crops, bulbs, and winter wheat. This information will be helpful to producers, lenders, processors, and others interested in making better farm management decisions, including financing, profit planning, crop mix decisions, and resolving related, farm-business management problems.

It is recommended that growers use the blank spaces provided to adjust the budget tables to their farm circumstances. Local Cooperative Extension agents and field persons should be consulted for recommendations on field operations and farm inputs.

Sources of Information

Interviews of area producers served as a basis for identifying commonly used field operations and machinery complements. These producers were considered to be representative of well-managed farms. The quantities and types of materials, i.e., fertilizers, herbicides, and insecticides, are based on recommended and widely used practices. Local farm input suppliers were contacted for price information on materials and other services used by farmers. For purposes of estimating machinery ownership costs, a 500-acre farm is assumed.

Budget Assumptions/Discussion

Land

Land is rented on an annual basis at 1997 market cash rents. Rent includes the land, a groundwater source, pumps, and mainlines for irrigation. The farm consists of 500 acres devoted to some combination of annual crops, 60 of which are in cucumbers.

¹ Extension Economist and Research Associate, WSU Puyallup; Horticulturist and Station Manager, WSU Mt. Vernon; and Extension Agent, Skagit County, Mt. Vernon, Cooperative Extension, Washington State University.

Labor

Field labor, excluding harvest labor, was hired at \$5.75 per hour. Irrigation labor and machine operator labor were paid \$6.75 and \$10 per hour, respectively. Field labor was utilized in hoeing and thinning. Irrigation labor was needed to move the handlines and other operations associated with irrigation.

Labor hours for machinery operation were calculated by multiplying 1.2 times machine hours to allow for machinery service, setup, movement, and adjustment. Harvest labor costs were based on 45% of gross returns.

Capital

Opportunity costs of capital, whether opportunity costs or an actual expense, were charged at a rate of 10% for current, intermediate, and long-term capital. Interest therefore represents a cash expense.

Machinery and Equipment

Machinery and equipment used reflect the typical machinery complements for row crop operations. Estimated machinery costs are shown in Appendix Table A where hourly equipment costs are outlined. Costs per acre were calculated by multiplying costs per hour times the annual hours in cucumber production. Machinery fixed costs (depreciation and interest) are based on 1997 new machinery prices and whole-farm hours of machinery use.

Irrigation

Handlines are used for supplemental irrigation. It is assumed that an acre-inch application was applied only once on half of the cucumber acreage. Irrigation costs reflect the cost of the handlines and associated labor costs to move them. Wells, pumps, and mainlines were assumed to be supplied with the land. Further, it was assumed all water was obtained from groundwater sources. Costs for used handlines and the necessary fittings were estimated at \$1.00 per foot. A 75hp electrical pump can apply one acre-inch in a five-hour set. It was further assumed that 7.5 acres could be irrigated per set with 800 feet of handline. Each set required one hour of labor to move the handlines. Finally, tractor and pipe trailer use was estimated at \$2.00 an acre. Repairs and maintenance costs of irrigation equipment were 3% of investment cost and irrigation equipment was assumed to have a 25% salvage value.

Farm Operations

Cultural operations are listed in the order they are performed.

In all primary tillage operations, the largest tractor available was utilized. Planting and other operations such as row cultivating were done with a smaller tractor. A 40-hp tractor with front-end loader was used to load bins during harvest.

Portable outhouses were rented on a monthly basis during hoeing and harvesting. It was assumed that one was utilized for every 20 acres allocated to cucumbers.

The quantities and types of materials, i.e., fertilizers, herbicides, and insecticides, were based on recommended and widely used practices. Prices for diesel and gasoline fuel were \$0.89 and \$1.25 per gallon. Electricity was based on \$.06/kwh.

Harvest

Hand harvest costs include harvest labor, housing and taxes for the labor, and hauling the cucumbers to a receiving station.

Cost Definitions

Costs are divided into fixed and variable. Fixed or ownership costs include depreciation, interest, and insurance. These costs do not vary with the crops produced and are incurred whether or not the crop is grown. Machinery fixed costs for a specific field operation were estimated by multiplying the machine hours per acre times the per hour fixed cost and based on prices for new machinery.

Variable or operating costs vary directly with the crop grown and the number of units or acres produced. Variable costs include fuel, oil, repairs, machinery operating labor and all inputs such as fertilizer, chemicals, and custom work. Overhead variable costs represent miscellaneous expenses and are difficult to assign to a particular enterprise.

They typically include such things as utilities, licenses, taxes, insurance, professional services, utility vehicles and ground maintenance equipment, organizational fees and dues, labor recruitment expense, office expenses, and the maintenance and operation of a farm shop. The budgets in this study assumed an overhead rate of 5% of variable costs.

In the long run, returns over all costs must be positive to ensure that machinery and equipment can be replaced and that the operator's owned assets are earning equal to the opportunity cost of these assets.

The budget data is presented in three tables.

Table 1A. Schedule of Operations and Costs Per Acre. This table presents a list of field operations by calendar month. For each field operation machinery and labor hours, fixed and variable costs as well as total costs are presented. Footnotes are used to detail the inputs used with each operation.

Table 1B. Summary of Per Acre Costs. This table summarizes both variable and fixed costs incurred to produce cucumbers. For each input the units, price per unit, and the quantity of units are indicated. Space is also provided for users to revise the budget data as appropriate.

Table 1C. Summary of Receipts, Costs, and Profitability. Gross returns to management are calculated by subtracting all non-management costs from gross returns. The residual after all other costs are accounted for is the return to management.

TABLE 1A. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING HAND HARVESTED CUCUMBERS IN NORTHWESTERN WASHINGTON;
60 ACRES ON A 500-ACRE FARM

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.		
DISC (2X)	130HP; DISC-OFFSET 15'	SEP 1996	.32	.47	9.54	6.09	4.66	.00	.00	.09	10.83	20.38
CULTIVATE	130HP, FIELD CULTIVATOR 15'	SEP 1996	.11	.16	2.60	1.87	1.55	.00	.00	.03	3.45	6.05
CHISEL	130HP, HEAVY CHISEL 10'	SEP 1996	.28	.40	5.97	4.55	3.99	.00	.00	.07	8.61	14.58
PLOW	130HP, PLOW, 4-16" 2-WY	APR 1997	.43	.62	12.82	8.43	6.21	.00	.00	.73	15.37	28.19
CULTIMULCH (2X)	130HP, CULTIMULCHER 13'	APR 1997	.35	.51	10.08	6.52	5.08	.00	.00	.58	12.18	22.26
FERTILIZE	CUSTOM FERTILIZE (1)	APR 1997	.00	.00	.00	.00	.00	6.00	77.02	3.95	86.97	86.97
LIME	CUSTOM LIME (INCL 1 TON) (2)	APR 1997	.00	.00	.00	.00	.00	15.00	.00	.75	15.75	15.75
DISC	130HP, DISC-OFFSET 15'	APR 1997	.16	.23	4.77	3.04	2.33	.00	.00	.27	5.64	10.41
DISC	130HP, DISC-OFFSET 15'	APR 1997	.16	.23	4.77	3.04	2.33	.00	.00	.27	5.64	10.41
CULTIMULCH (2X)	130HP, CULTIMULCHER 13'	MAY 1997	.35	.51	10.08	6.52	5.08	.00	.00	.48	12.08	22.16
SPRAY HERBICIDE	CUSTOM SPRAY (3)	MAY 1997	.00	.00	.00	.00	.00	9.00	15.00	1.00	25.00	25.00
PLANT & FERT.	60HP, PLANTER-4R (4)	MAY 1997	.22	.31	8.81	2.03	3.12	.00	96.00	4.21	105.37	114.17
SPRAY HERBICIDE	CUSTOM SPRAY (5)	MAY 1997	.00	.00	.00	.00	.00	9.00	5.32	.60	14.91	14.91
CULT. & FERT.	60HP, CULTIVATOR W/ATT (6)	JUN 1997	.16	.24	3.95	1.02	2.36	.00	35.00	1.28	39.66	43.60
SPRAY FUNGICIDE	CUSTOM SPRAY (7)	JUN 1997	.00	.00	.00	.00	.00	9.00	12.50	.72	22.22	22.22
ROTOVATE	60HP, ROTOVATOR 13'	JUN 1997	.17	.24	6.40	1.47	2.39	.00	.00	.13	3.99	10.39
IRRIGATE	IRRIGATE	JUN 1997	.00	.00	12.00	.00	.00	6.00	.00	.20	6.20	18.20
CULTIVATE	60HP, CULTIVATOR-4R	JUN 1997	.16	.24	3.95	1.02	2.36	.00	.00	.11	3.49	7.44
HOE & THIN	CUSTOM HOE & THIN	JUL 1997	.00	.00	.00	.00	.00	74.75	.00	1.87	76.62	76.62
POLLINATE	CUSTOM POLLINATE (8)	JUL 1997	.00	.00	.00	.00	.00	25.00	.00	.63	25.62	25.62
SPRAY FUNGICIDE	CUSTOM SPRAY (9)	JUL 1997	.00	.00	.00	.00	.00	9.00	12.50	.54	22.04	22.04
SANITATION	PORTABLE TOILETS, 1 PER 30 AC	JUL 1997	.00	.00	.00	.00	.00	3.75	.00	.09	3.84	3.84
CULTIVATE	60HP, CULTIVATOR-4R	JUL 1997	.16	.24	3.95	1.02	2.36	.00	.00	.08	3.46	7.41
HARVEST PREP	DISTRIB. BINS (10)	AUG 1997	.00	.00	.00	.00	.00	5.75	5.00	.18	10.93	10.93
HARVEST	HAND HARVEST (11)	AUG 1997	.00	.00	.00	.00	.00	1645.20	.00	27.42	1672.62	1672.62
HAUL	CUSTOM HAUL (12)	AUG 1997	.00	.00	.00	.00	.00	108.00	.00	1.80	109.80	109.80
OVERHEAD	5% VARIABLE COSTS	ANN 1997	.00	.00	.00	.00	.00	116.11	.00	.00	116.11	116.11
LAND RENT	LAND RENT	ANN 1997	.00	.00	200.00	.00	.00	.00	.00	.00	.00	200.00
PICKUP USE	3/4 TON PICKUP	ANN 1997	.00	.00	10.42	.00	.00	.00	.00	.00	.00	10.42
TOTAL PER ACRE			3.04	4.38	310.10	46.61	43.81	2041.56	258.33	48.08	2438.40	2748.50

(1) 100 LBS/AC SUL-PO-MAG; 50 LBS/AC MAG. SULFATE; 20 LBS/AC ZINC SULFATE; 14 LBS/AC GRANUBOR; 100 LBS/AC MURATE OF POTASH
(2) 1 TON/AC LIME (3) 2 PT/AC CURBIT (4) 300 LBS/AC 11-52-0; 3 LBS/AC CALYPSO SEED (5) 2 PT/AC CURBIT
(6) 250 LBS/AC 34-0-0 (7) 1 QT/AC BRAVO (8) 1 HIVE/AC (9) 1 QT/AC BRAVO (10) 5 BUCKETS/AC (PAILS)
(11) INCLUDES HAND HARVEST, LABOR, TAXES, & HOUSING (12) 12 TONS/AC CUSTOM HAUL

SUMMARY OF PER-ACRE COSTS FOR PRODUCING HAND
HARVEST CUCUMBERS IN NORTHWESTERN WASHINGTON;
TABLE 1B. 60 ACRES ON A 500-ACRE FARM

		PRICE OR		VALUE OR	YOUR
		UNIT COST/UNIT	QUANTITY	COST	FARM
VARIABLE COSTS					
CUSTOM FERT.	AC	\$6.00	1.00	\$6.00	_____
SUL-PO & POTASH	LB	.26	200.00	52.00	_____
MANG. SULFATE	LB	.18	50.00	9.00	_____
ZINC SULFATE	LB	.50	20.00	10.00	_____
GRANUBOR	LB	.43	14.00	6.02	_____
CUSTOM LIME	AC	15.00	1.00	15.00	_____
11-52-0	LB	.20	300.00	60.00	_____
SEED	LB	12.00	3.00	36.00	_____
CUSTOM SPRAY	AC	9.00	4.00	36.00	_____
CURBIT	PT	7.50	2.00	15.00	_____
COMMAND	PT	10.63	.50	5.32	_____
BRAVO	QT	12.50	2.00	25.00	_____
34-0-0	LB	.14	250.00	35.00	_____
HOE & THIN	AC	74.75	1.00	74.75	_____
POLLINATE	AC	25.00	1.00	25.00	_____
SANITATION	AC	3.75	1.00	3.75	_____
PAIS	AC	5.00	1.00	5.00	_____
TRACTOR REPAIR	ACRE	15.52	1.00	15.52	_____
TRACTOR FUEL/LUBE	ACRE	20.35	1.00	20.35	_____
MACHINERY REPAIRS	ACRE	10.74	1.00	10.74	_____
MACHINE FUEL/LUBE	ACRE	.00	1.00	.00	_____
IRRIGATE LABOR	DOL	2.00	1.00	2.00	_____
IRRIG. POWER	DOL	2.00	1.00	2.00	_____
IRRIG. MAINT.	DOL	2.00	1.00	2.00	_____
HARVEST PREP	AC	5.75	1.00	5.75	_____
HAND HARVEST	TON	112.50	12.00	1350.00	_____
CUSTOM HAUL	TON	9.00	12.00	108.00	_____
LABOR TAXES	TON	17.60	12.00	211.20	_____
LABOR HOUSING	TON	7.00	12.00	84.00	_____
LABOR (TRAC/MACH)	ACRE	43.81	1.00	43.81	_____
VAR. OVERHEAD	DOL	.05	2322.29	116.11	_____
INTEREST ON OP. CAP.	DOL.	.10	469.79	48.08	_____
TOTAL VARIABLE COST				\$2438.40	_____
FIXED COSTS					
EQUIPMENT:					
DEPRECIATION	ACRE	\$40.73	1.00	\$40.73	_____
INTEREST	ACRE	35.04	1.00	35.04	_____
INSURANCE	ACRE	2.10	1.00	2.10	_____
TAXES	ACRE	6.30	1.00	6.30	_____
HOUSING	ACRE	3.50	1.00	3.50	_____
IRRIGATION	ACRE	12.00	1.00	12.00	_____
LAND RENT	AC	200.00	1.00	200.00	_____
PICKUP	ACRE	10.42	1.00	10.42	_____
TOTAL FIXED COST				\$310.10	_____
TOTAL COST				\$2748.50	_____

**SUMMARY OF RECEIPTS, COSTS, AND PROFITABILITY PER ACRE FOR
PRODUCING HAND HARVEST CUCUMBERS IN NORTHWESTERN WASHINGTON;
TABLE 1C. 60 ACRES ON A 500-ACRE FARM**

		PRICE OR UNIT COST/UNIT	QUANTITY	VALUE OR COST	YOUR FARM
<hr/>					
REVENUE					
CUCUMBERS	TON	250.00	12.00	\$3000.00	_____
1. TOTAL REVENUE				\$3000.00	_____
LESS: - TOTAL VARIABLE COST				2438.40	_____
2. RETURNS OVER VARIABLE COST				561.60	_____
LESS: - MACHINERY FIXED COST				110.10	_____
3. RETURNS TO LAND AND MANAGEMENT				451.50	_____
LESS: - LAND COSTS				200.00	_____
4. GROSS RETURNS TO MANAGEMENT				\$251.50	_____
<hr/>					

APPENDIX TABLE A.

SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING HAND HARVESTED CUCUMBERS IN NORTHWESTERN WASHINGTON;
60 ACRES ON A 500-ACRE FARM

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
CHISEL, HEAVY	3,700.00	12	150	1.77	1.40	.08	.25	.14	3.65	1.76	.00	1.76	5.41
ROTOVATOR	13,500.00	15	100	8.14	7.40	.44	1.33	.74	18.05	4.18	.00	4.18	22.23
CULTIMULCHER	12,000.00	8	200	5.80	3.68	.22	.66	.37	10.73	3.84	.00	3.84	14.57
DISC, OFFSET	13,000.00	8	200	6.29	3.98	.24	.72	.40	11.63	4.16	.00	4.16	15.79
PLOW, 4-16, 2WY	12,000.00	12	150	5.74	4.56	.27	.82	.46	11.85	4.89	.00	4.89	16.73
FIELD CULTIVATOR	7,000.00	15	150	2.81	2.56	.15	.46	.26	6.24	2.66	.00	2.66	8.90
PLANTER, 4ROW	15,000.00	15	100	9.04	8.22	.49	1.48	.82	20.05	4.65	.00	4.65	24.70
CULT W/ATT - 4R	4,000.00	8	200	1.93	1.23	.07	.22	.12	3.58	1.54	.00	1.54	5.11
TRACTOR, 2WD	71,000.00	10	750	6.67	6.13	.37	1.10	.61	14.89	5.61	6.59	12.21	27.09
TRACTOR, 2WD	23,400.00	12	200	7.31	7.31	.44	1.32	.73	17.11	.87	3.04	3.92	21.03
TRACTOR W/LOADER	25,000.00	12	150	10.42	10.42	.63	1.88	1.04	24.38	.81	2.03	2.84	27.21
PICKUP, 3/4T	22,000.00	7	222	12.74	5.45	.33	.98	.55	20.04	1.58	.00	1.58	21.62

Alternate formats of our educational materials are available upon request for persons with disabilities. Please contact the Information Department, College of Agriculture and Home Economics.

Washington State University Cooperative Extension publications contain material written and produced for public distribution. You may reprint written material, provided you do not use it to endorse a commercial product. Please reference by title and credit Washington State University Cooperative Extension.

College of Agriculture and Home Economics, Pullman, Washington. Issued by Washington State University Cooperative Extension and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Cooperative Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, color, gender, national origin, religion, age, disability, and sexual orientation. Evidence of noncompliance may be reported through your local Cooperative Extension office. Trade names have been used to simplify information; no endorsement is intended. Published July 1997. Subject code 321. A. EB1830