Cost of Producing Machine-Harvested Pickling Cucumbers in Michigan
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AG FACTS

COST OF PRODUCING MACHINE-HARVESTED PICKLING CUCUMBERS IN MICHIGAN

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Michigan ranks first in the nation in producing pickling cucumbers. Approximately 23,000 acres are grown in the state with 50 percent machine harvested and the remainder hand harvested.

Pickling cucumbers are a warm season crop requiring high temperatures for optimum growth and development. Under favorable climatic conditions it takes from 45-50 days from planting to first harvest. They favor well-drained sandy loam soils, and most growers provide irrigation to maximize yields. Cucumbers require a constant supply of moisture during flowering and fruit development. The crop also benefits from high fertility levels, so soil testing is essential to produce a high yielding crop. Disease, insect and weed control are also essential to produce quality cucumbers.

The machine-harvested pickling cucumbers that are produced in Michigan are grown by farmers that specialize in vegetables. Rotational crops include other vegetables and agronomic crops such as corn, soybeans and small grains.

Specialized harvesting equipment is utilized in machine-harvested cucumbers. Harvesters have evolved over the past twenty five years, so most cucumber sizes can be mechanically harvested with reasonable recovery rates. Machines have been customized by growers to fit their needs.

Growers contract with pickling cucumber processing companies to grow cucumbers, and contracts vary between companies as to volume and fruit size requirements. Processing companies require specific varieties and have strict pesticide guidelines that growers must follow.

Knowing the costs of each significant enterprise on the farm is essential to a successful business. Given the narrow margins and fluctuating prices in farming, it is not adequate to know only the total farm costs; it is essential to know the costs of each enterprise on the farm. When aware of the costs and returns per unit of an enterprise, reliable decisions can be made concerning expansion, contraction, elimination or addition of an enterprise. When such decisions are made without accurate data, serious consequences often result. This report attempts to provide data to aid in those decisions.

The information in this report was gathered from the records of commercial growers. Where appropriate, the figures were reviewed by farm suppliers and Extension specialists. The information is presented in the format of the "typical farm" as determined by those growers sharing information. Consequently, the figures do not represent any one farm but rather a consensus of realistic figures based on the information shared.

THE TYPICAL FARM

The "typical farm" in this study has the following characteristics.

- 600 tillable acres
- 200 acres (one third) in pickling cucumbers
- A full complement of machinery, equipment, buildings and improvements to operate the farm plus the specialized equipment necessary for pickling cucumber production.
- The 200 acre pickling cucumber enterprise is irrigated and yields 275 bu. per acre.
- No grading is done on the farm.

FIXED COSTS + VARIABLE COSTS = TOTAL COST

The various costs included in this study are divided into two categories: fixed and variable. Fixed costs include those that vary little, if any, with the amount produced on the farm (such as property taxes and interest on investment). Variable costs include those that vary more directly with production including hired labor, fuel, fertilizer, pesticides, etc.

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Fixed Costs

Table 1A lists the general machinery and equipment complement needed to operate the typical 600 acre farm and presents the first fixed cost, depreciation on general machinery and equipment. It also gives the average value of machinery and equipment which is used to calculate another fixed cost, interest on the machinery and equipment investment (shown in Table 3). Table 1B includes the specialized equipment for pickling cucumber production. It is assumed one planter and harvester are sufficient for the 200 acres. Table 2 includes the inventory of land, general buildings, and improvements.

Table 3 brings all the fixed costs together. Depreciation is taken directly from the calculated values in Tables 1A, 1B, and 2. Interest on investment is determined by charging 6% on the average values calculated in Tables 1A, 1B, and 2, except for land which is charged at 4%. Repairs and maintenance is considered a fixed cost on buildings and improvements, but a variable cost for machinery and equipment. Taxes and insurance are the final fixed costs.

The "general" machinery, equipment, buildings, and improvements are used to operate the whole farm, not just to produce pickling cucumbers. Since pickles make up one-third of the income producing acreage, one-third of the cost of owning these items is charged to the pickle enterprise. The costs associated with owning the "specialized" machinery and equipment are charged entirely (100%) to the pickling cucumber enterprise.

There are numerous methods used to allocate general fixed costs to the various enterprises on the farm. Here, they are allocated on the basis of income producing acreage. Another common method is to allocate these costs on the basis of gross receipts generated by the various enterprises. When allocating these costs on your farm, use a method that best represents reality for your business. Table 3 indicates that the portion of the total fixed costs charged to the pickling cucumber enterprise is $61,234, ($306 per acre).

Variable Costs

The variable costs (sometimes called direct or operating costs) to produce an acre of pickling cucumbers are listed in Table 4. The values reflect per acre cost based on a 200 acre enterprise with a 275 bu. yield. The quantities of inputs listed in Table 4 do not necessarily reflect university recommendations but represent grower practices. Most items in Table 4 are self explanatory but one item needs explanation: interest on operator capital. Regardless of whether a grower borrows operating money to plant and grow the crop, or takes it out of savings, a charge must be made for its use. Interest is charged only on the growing costs and not on the harvesting costs, due to the assumption that the latter will be paid from receipts as they occur. On many farms this is not the case because receipts come in long after harvest. On such farms, charge interest on the total variable costs rather than on the growing costs alone.

As can be seen in Table 4, the variable costs for a 200 acre typical pickling cucumber enterprise total $489 per acre.

Total Costs and Returns

Table 5 brings together the variable and the fixed costs for producing pickling cucumbers and compares these costs with typical gross receipts. These costs are calculated both on a per acre and per bushel basis. The figures in Table 5 indicate that with a 275 bushel yield, the total cost of producing a bushel is $2.89. Since it was assumed that the average price paid was $2.85 per bushel, the enterprise just about broke even. This situation is much better than that found in cost-of-production studies of most other vegetables crops. Table 6 indicates the net profit or loss per bushel given a range on yields and prices.

When analyzing your own farm, use your own figures whenever available. Use the figures in this report to supplement yours and/or for comparison. Given differences in land, equipment, size, management, weather and markets, no set of figures can be exact. However, the figures in this report can be an important asset when making decisions related to producing pickling cucumbers.

Table 1A

GENERAL MACHINERY AND EQUIPMENT COSTS FOR A TYPICAL FARM PRODUCING MACHINE-HARVESTED PICKLING CUCUMBERS, MICHIGAN: 1992[1]

Item	New Price	Salvage Value [2]	Average Value [3]	Annual Deprec.[4]
TRACTORS				
145 hp diesel (FW assist)	$ 65,000	$ 35,000	$ 50,000	$ 3,000
100 hp diesel (FW assist) (with loader)	55,000	30,000	42,500	2,500
85 hp diesel (FW assist)	40,000	20,000	30,000	2,000
60 hp diesel (2 @32,000)	64,000	30,000	47,000	3,400
30 hp Gas (2 old)	———	———	5,000	———
TILLAGE				
6 bottom 18" plow	$ 14,000	$ 8,000	$ 11,000	$ 600
22' disk	14,000	6,000	10,000	800
23' field cultivator	9,000	4,000	6,500	500
19' chisel plow	9,000	4,000	6,500	500
15' rotary hoe	3,200	1,200	2,200	200
Cultipacker	3,500	1,500	2,500	200
CROP MAINTENANCE				
300 gal. sprayer	5,000	1,500	3,250	350
3 pt. sprayer	4,500	1,000	2,750	350
MISCELLANEOUS				
Stake truck	$ 24,000	$ 4,000	$ 14,000	$ 2,000
4 WD pick-up truck	16,000	2,000	9,000	1,400
4 WD pick-up truck (old)	———	———	5,000	———
Gravity wagons (6 @ $2,200)	13,200	6,000	9,600	720
Brush hog	900	500	700	40
ATV	3,000	1,000	2,000	200
Scraper blade	800	400	600	40
Fuel tanks (2 @ $500)	1,000	600	800	40
Water pump	600	300	450	30
Shop power tools, welders	20,000	12,000	16,000	800
Shop tools	5,000	2,000	3,500	300
Office equip.	5,000	1,000	3,000	400
TOTALS			**$ 283,850**	**$20,370**

1. General machinery and equipment necessary to operate a farm with 600 tillable acres.
2. 10-year life was assigned to all machinery and equipment.
3. Determined by adding new price and salvage value, then dividing by 2.
4. Annual depreciation = (new price - salvage value)/10 years.

Table 4.
VARIABLE COSTS PER ACRE FOR MACHINE-HARVESTED PICKLING CUCUMBER PRODUCTION, MICHIGAN: 1992

	Amount/Acre	Price	Cost/Acre
GROWING			
cover crop seed (rye)	1 bu.	$ 5.00/bu.	$ 5.00
Seed (cucumber)	5 lbs.	15.00/lb.	75.00
Lime			5.00
Fertilizer			
N	90 lbs.	.20/lb.	18.00
$P_2 0_5$	50 lbs.	.20/lb.	10.00
$K_2 0$	300 lbs.	.11/lb.	33.00
Fungicide			
Ridomil	2 pts.	17.43/pt.	34.86
Bravo (on 50% of crop)	1 qt.	12.20/qt.	6.10
Copper (on 50% of crop)	2 pts.	1.75/pt.	1.75
Insecticide-(Furadan)	6 1/2 lbs.	1.90/lb.	12.35
Herbicides			
Curbit	2 1/2 pts.	4.35/pt.	10.88
Alanap (on 50% of crop)	2 qts.	6.00/qt.	6.00
Poast (on 50% of crop)	1 pt.	12.50/pt.	6.25
Cultural Labor			
Preparation (inc. cover crop)	1.6 hr.	10.00 hr.	16.00
Planting	0.5 hr.	10.00 hr.	5.00
Irrigation (6x)[1]	0.1 hr.	10.00 hr.	6.00
Cultivation	0.6 hr.	10.00 hr.	6.00
Rotary hoe	0.2 hr.	10.00 hr.	3.00
Spraying (3x)	0.1 hr.	10.00 hr.	3.00
Sidedressing	.04 hr.	10.00 hr.	.40
Fringe benefits (20% of payroll: $39.40)			7.88
Fuel oil[2]			40.00
Machinery repair			28.00
Machine hire			12.00
Bee rental	0.5 hive	32.00/hive	16.00
Supplies and parts			42.00
Utilities			11.00
Accounting			11.00
Interest on oper. cap ($439.87 X 6% X 0.5 yr)			13.20
Total Growing and Interest			**$444.67**
HARVESTING			
Labor	3 hours	10.00/hr.	30.00
Hauling to Processor(2.00/1000 bu.loaded mile X 10 mi _ 275 bu/A)			5.50
Fuel Oil			8.50
Total Harvesting			**$ 44.00**
Total Variable Costs			**$488.67**

1. The amount of irrigation labor per acre represents an approximate average of the requirements for hand set and the requirements for center pivot systems.

2. Includes energy to operate irrigation.

Table 5.
PER ACRE AND PER BUSHEL COSTS FOR MACHINE-HARVESTED PICKLING CUCUMBER PRODUCTION, TYPICAL FARM, MICHIGAN: 1992

Item	Per Acre	Per Bushel
GROSS RECEIPTS		
275 bu./A x $2.85/bu.[1]	**$783.75**	**$ 2.85**
GROWING (from Table 4)		
Seed	$ 80.00	$ .29
Fertilizer and lime	66.00	.24
Fungicide	42.61	.15
Insecticides	12.35	.04
Herbicides	23.13	.08
Cultural labor	47.28	.17
Fuel, oil	40.00	.15
Machinery repair	28.00	.10
Machine hire	12.00	.04
Bee rental	16.00	.06
Supplies and parts	42.00	.15
Utilities	11.00	.04
Accounting	11.00	.04
Interest on operating capital	13.20	.05
Total Growing + Interest	**$444.67**	**$ 1.62**
HARVESTING (from Table 4)		
Total Harvesting	**$ 44.00**	**$ .16**
TOTAL VARIABLE COSTS	**$488.67**	**$ 1.78**
FIXED COSTS (from Table 3)		
Depreciation	$ 94.89	$ .34
Interest on investment	156.02	.57
Repairs and maintenance	4.44	.02
Taxes	35.00	.13
Insurance	15.84	.06
TOTAL FIXED COSTS	**$306.19**	**$ 1.11**
TOTAL COSTS (variable + fixed)	**$794.86**	**$ 2.89**
Net Return (loss)		**($ .04)**

1. Yield and price vary dramatically from year to year. Some fields some years average 100 bu. per acre while others yield 360 bu. If you are aware of local yields (or your own), use them in the analysis.

Table 6.

NET RETURN OR LOSS PER BUSHEL RELATIVE TO YIELD OF MACHINE-HARVESTED CUCUMBERS, MI 1992

	PRICE PER BUSHEL					
Yield (bu.)	**$2.75**	**$2.85**	**$2.95**	**$3.05**	**$3.15**	**$3.25**
250	-.43	-.33	-.23	-.13	-.03	+.07
275	-.14	-.04	+.06	+.06	+.26	+.36
300	+.10	+.20	+.30	+.40	+.50	+.60
325	+.30	+.40	+.50	+.60	+.70	+.80
B.E. Yield (bu.)	**289**	**279**	**269**	**261**	**252**	**245**

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