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The Cost of Producing Bell Peppers

Michigan State University Extension Service

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# The Cost of Producing Bell Peppers

by

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**M**ichigan ranks seventh in the nation in producing green bell peppers, also known as globe or bell peppers. Approximately 2,500 acres are grown in the state with over 90 percent going to fresh market and the remainder to processing.

Green peppers are a profitable crop. However, the figures are deceiving due to the tremendous variability in yield and price, cultural practices, and marketing. Peppers are very sensitive to variations in weather, and because most peppers are used for fresh market, fluctuating yields due to weather cause prices to widely fluctuate.

Cultural practices vary considerably, particularly in the use of irrigation. Some growers use none, some use irrigation to get the plants started and some irrigate regularly throughout the growing season. Since the latter practice seems to be the trend in Michigan, a solid set irrigation system used ten times during the season is assumed in this report. The growers that provided the figures for this report have all been producing peppers for many years and have established stable marketing arrangements that reduce marketing risks considerably. Though good marketing arrangements take time to develop, they are assumed as being in place in this report.

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 today, it is not enough to know only the total farm costs; you must know the costs of each enterprise on the farm. When aware of the costs and returns per unit of an enterprise, you can make reliable decisions about whether to expand, contract, eliminate, or add an enterprise. When such decisions are made without accurate data, serious consequences often result. This report provides data to aid in those decisions.

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## The Typical Farm

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Data for this study were developed by bringing together a group of vegetable growers who were willing to share their farm and pepper enterprise records. Through consensus, a "typical farm" was outlined, with the size, investments and costs representative of vegetable growers in Michigan. These data were then compared with data supplied by input suppliers, specialists and studies done in other states. The resulting information provided here is a best estimate and therefore varies from figures found on any particular farm.

Our typical farm has the following statistics:

- 150 total acres, of which 125 acres are tillable.
- Most or all of the 125 acres are in intensive vegetable and/or grain production, with 40 acres in peppers.
- The pepper enterprise has a field yield of 1,000 bushels with a packout of 720 boxes. A box contains 1 1/9 bushel.
- Solid set irrigation to supply 40 acres.
- Transplants are greenhouse grown plug plants.

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## Structuring the Costs

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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.

## **Fixed Costs**

Table 1A lists the general machinery and equipment needed to operate our 150 acre farm. An annual depreciation is calculated for this machinery. "Average value" is also calculated to help determine another fixed cost, interest on investment. Table 1B calculates these same costs for specialized equipment needed to produce 40 acres of peppers.

Table 2 shows the investments in land, buildings and improvements for our typical farm. Again, depreciation is determined for the buildings and improvements and average value is calculated to determine interest on investment.

Table 3 brings together those costs associated with machinery, equipment, land, buildings and improvements outlined in Tables 1A, 1B and 2. It also illustrates the other fixed costs associated with operating a vegetable farm of this size. Note that only 32 percent of the general fixed costs are charged to the pepper enterprise. Because peppers are grown on 32 percent of the income producing acreage (40 acres of 125 tillable = 32 percent). There are other methods to allocate fixed costs to the various enterprises (percent of gross sales for example) but for vegetable farms, percent of income producing acreage is very common. Of course, those fixed costs associated specifically with pepper production are charged at 100 percent to the enterprise. On our typical farm, the fixed costs charged to the pepper enterprise total \$28,042, or \$701 per acre.

## **Variable Costs**

Table 4 includes the variable costs associated with producing peppers. The costs are given on a per acre basis, with the per acre costs based on the production of 40 acres. The inputs listed in Table 4 do not necessarily reflect recommendations by Cooperative Extension Service specialists. Instead, they represent the practices of the growers participating in the study.

One item in Table 4 needs explanation: interest on operating 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 on the growing costs but not on the harvesting and marketing costs because it is assumed that the latter will be paid from receipts as they occur. On many farms, this is not the case because the receipts come in long after harvest. On such farms, interest should be charged to the total variable costs rather than to the growing costs alone. As shown in Table 4, the variable costs per acre of peppers for a 40-acre "typical" enterprise total \$3,526 per acre.

## **Total Costs and Returns**

Table 5 brings together the variable costs and the fixed costs for producing peppers and compares these costs with typical gross receipts. These costs are calculated both on a per acre basis and on a per box of product basis.

The figures in Table 5 indicate that this typical pepper enterprise was profitable (profit of \$93 per acre or \$.14 per box). Of course, on a particular farm the yield may be lower, the prices may be lower and/or the costs may be higher than those on our "typical" farm. If any of these situations were to exist, the crop could show a net loss.

The per acre and per box costs from Table 5 indicate that total variable costs are broken down to 34 percent for growing, 26 percent for harvesting, and 40 percent for packing and marketing.

To calculate the per acre and per box costs and returns for the pepper enterprise on your farm, use the procedure outlined in this report, but use your own figures if available. As mentioned, the figures in this report are best estimates based on data from a few farms. If you have data on your own farm, it will make the best estimates even more accurate.

**Table 1A. MACHINERY AND EQUIPMENT COST FOR A TYPICAL FARM<sup>1/</sup> PRODUCING PEPPERS  
IN MICHIGAN: 1990**

Item	New Price	Salvage Value <sub>2/</sub>	Average Value <sub>3/</sub>	Annual Deprec. <sub>4/</sub>	Your Farm
<b>TRACTORS</b>					
75hp diesel (FW assist)	\$ 32,000	\$ 15,000	\$ 23,500	\$ 1,700	\$ _____
55hp diesel	21,000	11,000	16,000	1,000	_____
40hp diesel	18,000	9,000	13,500	900	_____
75hp diesel with backhoe & bucket loader (old)			7,500	0	_____
30hp gas (old)			3,000	0	_____
Garden tractor	5,000	1,000	3,000	400	_____
Forklift for inside (old)			7,500	0	_____
<b>TILLAGE</b>					
4-18" Plow	\$ 9,000	\$ 1,000	\$ 5,000	\$ 800	\$ _____
12' Disk	5,000	500	2,750	450	_____
12' Cultimulcher (old)			4,000	0	_____
Spring tooth drag (old)			1,000	0	_____
Cultipacker (old)			2,500	0	_____
Subsoiler	3,200	800	2,000	240	_____
6' Rototiller	4,000	1,000	2,500	300	_____
<b>PLANTING</b>					
4-row Transplanter	\$ 20,000	\$ 10,000	\$ 15,000	\$ 1,000	\$ _____
3 pt. Fertilizer Spreader	1,500	500	1,000	100	_____
4-row Side Dresser (old)	3,600	1,000	2,300	260	_____
Drill	10,000	4,000	7,000	600	_____
<b>CROP MAINTENANCE</b>					
4-row Cultivator	\$ 3,000	\$ 1,000	\$ 2,000	\$ 200	\$ _____
Small Cultivator (old)			200	0	_____
350-gal. Sprayer	4,000	1,000	2,500	300	_____
3 pt. Sprayer	3,000	500	1,750	250	_____
Traveler Irrigation (old)			6,000	0	_____
Irrigation Pump	5,000	1,000	3,000	400	_____
<b>PACKING</b>					
Packing line + washer, dumper, & box mach.)	\$ 16,000	\$ 6,000	\$ 11,000	\$ 1,100	\$ _____
200 bu. Spreader	6,500	500	3,500	600	_____
<b>MISCELLANEOUS</b>					
4 WD Pick-up Truck	\$ 15,000	\$ 1,000	\$ 8,000	\$ 1,400	\$ _____
Pick-up Truck (old)			500	0	_____
Stake Truck	18,000	2,000	10,000	1,600	_____
Wagons (6 @ \$1,200)	7,200	3,000	5,100	420	_____
Power Shop Tools	10,000	2,000	6,000	800	_____
20 kw Generator	3,000	2,000	2,500	100	_____
5' Ditch Mower	3,500	1,500	2,500	200	_____
6' 3 pt. Blade	700	300	500	40	_____
Fuel Tank/Pump (2 @ \$1,000)	2,000	1,000	1,500	100	_____
Tote Boxes (50 @ \$30)	1,500	0	750	150	_____
Tools, Parts			5,000	0	_____
Office Equipment			3,000	0	_____
<b>TOTALS</b>			<b>\$194,350</b>	<b>\$ 15,410</b>	<b>\$ _____</b>

1/ The typical farm consists of 150 acres total with 135 acres tillable, of which 125 acres are in pepper production.

2/ A 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 1B. SPECIALIZED MACHINERY AND EQUIPMENT COST USED IN PEPPER PRODUCTION,  
TYPICAL FARM 1/, MICHIGAN: 1990**

Item	New Price	Salvage Value <u>2/</u>	Average Value <u>3/</u>	Annual Deprec. <u>4/</u>	Your Farm
Solid Set Irrigation (40A)	\$ 46,000	\$ 10,000	\$ 23,000	\$ 3,600	\$ _____
Irrigation	5,000	1,000	<u>3,000</u>	<u>400</u>	_____
<b>Total Specialized Machinery &amp; Equipment</b>			<b>\$ 26,000</b>	<b>\$ 4,000</b>	<b>\$ _____</b>

1/ The typical farm consists of 150 acres total with 135 acres tillable, of which 125 acres are in pepper production.

2/ A 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 2.

**LAND, BUILDINGS AND IMPROVEMENT COST FOR A TYPICAL FARM  
PRODUCING PEPPERS IN MICHIGAN, 1990**

Item	New Price	Salvage Value	Average Value	Annual Deprec. <u>1/</u>	Your Farm
Land (150 A @ \$1,500) <u>2/</u>	\$225,000	\$ --	\$225,000	\$ 0	\$ _____
Shop & Storage (40' X 80' X 16')	20,000	5,000	12,500	600	_____
Packing Shed (40' X 80' X 16')	20,000	5,000	12,500	600	_____
Cooler (20' X 30')	25,000	5,000	15,000	800	_____
Chemical Storage (10' X 10')	2,500	1,500	2,000	40	_____
Water Well (4" for packing shed)	3,000	0	1,500	120	_____
Water Wells (2 - 8" for irrigation)	20,000	0	<u>10,000</u>	<u>800</u>	_____
<b>TOTALS</b>			<b>\$278,500</b>	<b>\$ 2,960</b>	<b>\$ _____</b>
<b>Totals (buildings &amp; improvements only)</b>			<b>\$ 53,500</b>	<b>\$ 2,960</b>	<b>\$ _____</b>

1/ All items have 25-year life.

2/ Price reflects land that is tiled and/or has water available for irrigation.

**Table 3. FIXED COSTS CHARGED TO THE PEPPER ENTERPRISE TYPICAL FARM,  
MICHIGAN, 1990**

Item	Cost	Cost Charged To Peppers <sup>1/</sup>	Your Farm Cost Charged To Peppers
<b>DEPRECIATION</b>			
Machinery and equipment (Table 1A)	\$15,410	\$ 4,931	\$ _____
Machinery and equipment (Table 1B)	4,000	4,000	_____
Buildings and improvements (Table 2)	2,960	947	_____
Total Depreciation		\$ 9,878	\$ _____
<b>INTEREST <sup>2/</sup></b>			
Machinery and equipment (Table 1A) (\$194,350 x 10%)	\$19,435	\$ 6,219	\$ _____
Land (\$225,000 x 7.5%)	16,875	5,400	_____
Buildings and improvements (\$53,500 x 10%)	5,350	1,712	_____
Total Interest		\$15,931	\$ _____
<b>REPAIRS AND MAINTENANCE <sup>3/</sup></b>			
Buildings and improvements (\$53,500 x 4%)	\$ 2,140	\$ 685	\$ _____
Tiling	675	216	_____
Total Repairs and Maintenance		\$ 901	\$ _____
<b>TAXES</b>			
Real estate (\$35/A x 150 A)	\$ 1,313	\$ 420	\$ _____
<b>INSURANCE</b>			
Property, machinery, and equipment	\$ 1,350	\$ 432	\$ _____
Vehicles (incl. licenses)	\$ 1,500	480	_____
Total Insurance		\$ 827	\$ _____
<b>TOTAL FIXED COSTS (Pepper enterprise share)</b>		<b>\$28,042</b>	<b>\$ _____</b>
<b>Total Fixed Costs Per Acre Of Peppers</b> (\$28,042 ÷ 40 acres)		<b>\$ 701</b>	<b>\$ _____</b>

<sup>1/</sup> The 40-acre pepper enterprise uses 32 percent of the income-producing acreage, so 32 percent of general fixed costs for operating the farm are charged to peppers. For those fixed costs associated with equipment used exclusively in the production of peppers, 100 percent of such costs are charged to the pepper enterprise.

<sup>2/</sup> The investments cited in this section are the average values calculated in Tables 1A, 1B, and 2.

<sup>3/</sup> Farm records suggest that repairs and maintenance of buildings and improvements equal approximately 4 percent of average value annually. Repairs and maintenance costs on machinery and equipment are included in variable costs (see Table 4).

Table 4. VARIABLE COSTS PER ACRE FOR PEPPER PRODUCTION MICHIGAN, 1990

Item	Amount/ Acre	Price	Cost/ Acre	Your Farm Cost/Acre
<b>GROWING</b>				
Seed (rye)	1 bu	\$ 5.00	\$ 5.00	\$ _____
Seed (pepper)	0.25 lb	750.00	187.50	_____
Plugs (1000's)	14	25.00	350.00	_____
Fertilizer				_____
-N	120 lb	0.28	33.60	_____
-P	150 lb	0.21	31.50	_____
-K	220 lb	0.07	15.40	_____
Lime, micronutrients			15.00	_____
Fungicide			5.00	_____
Insecticides			50.00	_____
Herbicides			24.00	_____
Cultural labor				_____
-Preparation	1.2 hr	8.00	9.60	_____
-Planting	8.0 hr	6.00 <sup>1/</sup>	48.00	_____
-Irrigation (10X)	1.5 hr	6.00	80.00	_____
-Weeding	.05 hr	8.00	.40	_____
-Cultivation (2X)	0.5 hr	8.00	8.00	_____
-Spraying (7X custom hire)		4.50	31.50	_____
-Side-dressing (2X)	0.5 hr	8.00	8.00	_____
-Fringe benefits (20% of payroll: \$185.50)			37.10	_____
Fuel, oil <sup>2/</sup>			40.00	_____
Machinery repair (including all field equipment)			50.00	_____
Machine hire			5.00	_____
Utilities			15.00	_____
Miscellaneous (travel, etc.)			15.00	_____
Interest on oper. capital (\$1,094.60 x 10% x 0.5 yr)			54.73	_____
Total Growing and Interest			<u>\$1,149.33</u>	\$ _____
<b>HARVESTING <sup>3/</sup></b>				
Labor				_____
-Harvest	1,000 bu	0.75 <sup>1/</sup>	\$ 750.00	\$ _____
-Fringe benefits (20% of payroll: \$750.00)			150.00	_____
Porta-john rental (\$75/mo. for 5 mo. total)			9.38	_____
Total Harvesting			<u>\$ 909.38</u>	\$ _____
<b>PACKING AND HARVESTING <sup>3/</sup></b>				
Labor				_____
-Packing	720 box	0.40 <sup>1/</sup>	\$ 288.00	\$ _____
-Fringe benefits (20% of payroll: \$288.00)			57.60	_____
Boxes	720	0.80	576.00	_____
Brokerage fee (10% of gross sales: \$4,320)			432.00	_____
Total Packing & Marketing			<u>\$1,353.60</u>	\$ _____
<b>TOTAL VARIABLE COSTS PER ACRE</b>			<u>\$3,412.31</u>	\$ _____

<sup>1/</sup> Seasonal labor rates include cost of housing.

<sup>2/</sup> Includes irrigation fuel.

<sup>3/</sup> The "typical farm" has a field yield of 1,000 bushels and a packout of 720 boxes. A box holds 1 1/9 bushels.



**Table 5. PER ACRE AND PER BOX COSTS AND RETURNS FOR PEPPER PRODUCTION,  
TYPICAL FARM, MICHIGAN, 1990 1/**

Item	Per Acre	Per Box	Your Farm
<b>GROSS RECEIPTS</b>			
720 boxes	<u>\$4,320.00</u>	<u>\$ 6.00</u>	<u>\$ _____</u>
<b>GROWING (from Table 4)</b>			
Seed and plugs	\$ 542.50	\$ 0.753	<u>\$ _____</u>
Fertilizer	80.50	0.112	<u>_____</u>
Lime, micronutrients	15.00	0.021	<u>_____</u>
Fungicide	35.00	0.049	<u>_____</u>
Insecticides	50.00	0.069	<u>_____</u>
Herbicides	24.00	0.033	<u>_____</u>
Cultural labor	222.60	0.309	<u>_____</u>
Fuel, oil	40.00	0.056	<u>_____</u>
Machinery repair	50.00	0.069	<u>_____</u>
Machine hire	5.00	0.007	<u>_____</u>
Utilities	15.00	0.021	<u>_____</u>
Miscellaneous (travel, etc.)	15.00	0.021	<u>_____</u>
Interest on operating capital	<u>54.73</u>	<u>0.076</u>	<u>_____</u>
Total Growing + Interest	<u>\$1,149.33</u>	<u>\$ 1.60</u>	<u>\$ _____</u>
<b>HARVESTING (from Table 4)</b>			
Total Harvesting	<u>\$ 909.38</u>	<u>\$ 1.26</u>	<u>\$ _____</u>
<b>PACKING &amp; MARKETING (from Table 4)</b>			
Labor	\$ 345.60	\$ 0.480	<u>\$ _____</u>
Boxes	576.00	0.800	<u>_____</u>
Marketing	<u>432.00</u>	<u>0.600</u>	<u>_____</u>
Total Packing & Marketing	<u>\$1,353.60</u>	<u>\$ 1.88</u>	<u>\$ _____</u>
<b>TOTAL VARIABLE COSTS</b>	<u>\$3,412.31</u>	<u>\$ 4.74</u>	<u>\$ _____</u>
<b>FIXED COSTS (from Table 3)</b>			
Depreciation	\$ 246.95	\$ 0.342	<u>\$ _____</u>
Interest on investment	398.28	0.553	<u>_____</u>
Repairs and maintenance	22.53	0.031	<u>_____</u>
Taxes	10.50	0.015	<u>_____</u>
Insurance	<u>22.80</u>	<u>0.032</u>	<u>_____</u>
<b>TOTAL FIXED COSTS</b>	<u>\$ 701.06</u>	<u>\$ 0.97</u>	<u>\$ _____</u>
<b>TOTAL COSTS (variable + fixed)</b>	<u>\$4,113.37</u>	<u>\$ 5.71</u>	<u>\$ _____</u>
<b>Net Return (loss)</b>	<u>\$ 206.63</u>	<u>\$ .29</u>	<u>\$ _____</u>

1/ Based on a packout yield of 720 boxes.



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