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Costs of Asparagus Production in Western Michigan
Michigan State University Extension Service
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COSTS OF ASPARAGUS PRODUCTION IN WESTERN MICHIGAN



By Myron Kelsey, Larry Bradford
and Edgar Strong¹

This cost evaluation of asparagus production in western Michigan is an update of former studies and a projection of costs developed from a small group discussion with asparagus growers in the spring of 1984. Participants described common growing and harvesting practices used by average asparagus growers in the

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area. They agreed upon the acreage, equipment and cultural practices generally used by an asparagus grower.

These figures do not reflect the average cost of asparagus production for all growers because costs vary considerably from farm to farm.

However, the data can help a grower develop cost projections and better evaluate the farm. Each of the appropriate tables in this report includes a "Your Farm Cost" column for a grower to note costs for a par-

ticular operation. Where costs cannot be determined, the grower may wish to adjust and substitute the study data.

The data assume equipment and labor available for a hypothetical farm of 200 acres of diversified tree fruit including 80 acres of asparagus. However, the data in Table 1 are presented for 10 acres of asparagus, since it may be easier to visualize many of the resource inputs on this basis. Per-acre costs, as shown in Tables 2 through 5 can be determined from Table 1, by dividing by 10.

Table 1. Variable Costs Per Acre for Growing Asparagus in Michigan, 1984

Operation	Labor			Machinery						Materials		
	Labor per hr.	Wage Rate	Cost	Equipment	Hours of Use	Variable Cost/Unit	Total Variable Cost	Fixed Cost/Unit	Fixed Cost	Item	Cost Per 10 Acres	Total Variable Cost
Harvest Year Broadcast fertilizer	4	\$ 8.00	\$32.00	tractor (60 h.p.)	4	6.79	27.16	5.93	23.72	250# 0-0-60/Acre @\$144/ton	\$180	\$599.20
				fertilizer spreader	4	3.76	15.04	10.71	42.84	150# actual N/Acre @ .23 /lb.	345	
2nd fertilizer application and cultivate	4	8.00	32.00	tractor (60 h.p.)	4	6.79	27.16	5.93	23.72	100# 18-46-0 per acre @\$250/ton	125	192.36
				cultivator and attachments	4	2.05	8.20	2.70	10.00			
Herbicide sprays (2 x)	4	8.00	32.00	tractor (60 H.P.)	4	6.79	27.16	5.93	23.72	Chemicals \$18/Acre 1st spray; \$20/Acre second spray	180	458.68
				Weed sprayer	4	4.88	19.52	8.87	35.48		200	
Insecticide and fungicide Spray (6 x)	12	8.00	96.00	tractor (60 h.p.)	12	6.79	81.48	5.93	71.16	materials@ 7.50/spray/acre + 1cutworm spray@ \$10/acre	550	786.04
				sprayer	12	4.88	58.56	8.87	106.44			
Chop fern	4	8.00	24.00	tractor (80 h.p.)	3	7.02	21.06	9.37	28.11			
				Rotary mower	3	1.71	5.13	4.02	12.06			
Add lime	5	8.00	40.00	tractor (60 h.p.)	5	6.79	33.95	5.93	29.65			
Management 5 hrs/acre		8.00	400.00	fertilizer spreader	5	3.76	18.80	10.71	53.55	one ton lime/acre@\$14/ton	140	232.75
												400.00
			450.00				343.22		(460.45)		1720	2719.22

Labor Costs

The full-time labor classification includes the working time of the operator and regular hired help used for asparagus production. Operator labor is not considered a cash expense by producers; but to allow for differences in the proportion of work performed by regular hired help, which is a cash expense, and the operator, both have been included at the \$8 per hour rate. As a result, producers who do a major portion of the work may have a lower cash labor cost than the figures indicate. Part-time labor was charged at a rate of \$6.00 per hour including fringes, such as Social Security, worker's compensation, etc.

Equipment Costs

Major factors considered in the computation of equipment costs are initial cost, salvage value, years of life, annual usage, repair costs, insurance, interest and operating expenses, such as gas and oil. The operating or variable costs for each piece of equipment are charged to the crop in Tables 1, 6, 7 and 8 on the basis of direct hourly use of the equipment. The fixed costs such as depreciation and interest are shown in Table 1 but only included in Table 3.

Variable Costs

Variable costs are those that change directly with increases or decreases in the acreage of asparagus or yield with harvesting cost. Examples of costs which vary with acreage are spray material, fertilizer, hired labor and machinery operating costs. Costs that vary directly with harvest yields are harvest hours and machinery time.

Variable costs incurred in asparagus production are categorized by labor, machinery and materials in Table 1. The details of hours and types of labor, machinery used and hours of use, and types and amounts of materials used by operation are shown in Table 1. If a grower's costs for particular items are substantially higher than those shown, those components may need to be analyzed to see if they can be reduced. A high cost for a particular component may be justified if it contributes to suffi-

Table 2. Variable Harvest Cost for 1 Acre of Asparagus (1984)
(1400#/acre)

Item	Hours	Rate	Variable cost	Your Farm
Labor (regular)	90	6.00	540.00	_____
(piecework)	1400#/acre	11¢/lb.	1,540.00	_____
(management)	50	8.00	400.00	_____
Equipment				
Tractor (60 H.P.)	10	6.79	67.90	_____
S.P. Picker Aid	70	2.08	145.60	_____
Fork lift	10	.75	7.50	_____
Truck	200 mi.	.28	56.00	_____
TOTAL Variable Harvest Cost			\$2,757.00	_____
Variable Harvest Cost per acre			275.70	_____
Variable Harvest Cost per pound (1400#/acre)			19.7¢	_____

Table 3. Asparagus Overhead Costs Per 10 Acres Production in Michigan Harvest Year (1984)

Item	Total cost	Your Farm
Growing equipment (fixed cost)	\$ 460.45	_____
Harvest equipment (fixed cost)	527.60	_____
Interest on harvest year growing cost ($2719.22 \times .125 \times .5$)	169.95	_____
Interest on land ($\$1000 \times .10$)	1,000.00	_____
Interest on average value of establishment cost ($\frac{19186.58 \times .125}{2}$)	1,199.16	_____
Depreciation of establishment cost ($19186.58 \div 15$ years)	1,279.11	_____
Real Estate taxes (10 acres)	200.00	_____
Marketing—MACMA @ \$7.50/ton	52.50	_____
Promotion (1% of gross)	77.00	_____
Festival fee	10.00	_____
	<u>\$4975.77</u>	_____

ciently higher yield or improved quality.

Nearly all commercial units use a small gasoline-powered vehicle which provides a riding capacity for four or five harvest workers as they snap the asparagus spears by hand. The spears are carried on the harvest vehicle to the end of the row where they are dumped into a bulk box which is moved by a tractor lift. These variable costs of harvesting are included in Table 2. Labor is the major cost. Therefore, good labor management should enhance the profit picture. In most cases, there will be some higher or lower costs for some

items associated with higher or lower yields.

Overhead Costs

The overhead or fixed cost for asparagus production (Table 3) includes machinery overhead on the basis of the proportion of total farm use in asparagus, interest on investment, depreciation of initial investment in asparagus crowns and property taxes. The fixed costs of machinery are allocated to asparagus on the basis of hours of use on asparagus relative to the total hours of equipment use on the farm. Fixed costs of machinery include deprecia-

tion, interest on investment and insurance and housing costs. Interest, insurance and housing equals 12.7 percent of average value.

A grower should decide whether fixed costs should be considered part of the total cost for decision-making purposes. For instance, overhead is a fixed cost to the owner of an asparagus acreage, but a variable cost for the operator of rented acreage.

Production Costs Per Hundredweight

Per-acre yields are very important factors in determining production costs per cwt. of asparagus (Table 5). Variable costs per pound are based on the fact that preharvest costs per acre, such as spraying and fertilization do not vary greatly regardless of the yield obtained.

Table 4. Total Cost of Production of Asparagus in Harvest Years (1984)

	(1400 lbs. Production/acre)		Per pound	Your farm
	Per 10 acres	Per acre		
Variable growing cost (Harvest year)	\$2,719.22	\$271.92	19.4¢	
Variable harvest cost	2,757.00	275.70	19.7	
Overhead cost	4,975.77	497.58	35.5	
	\$10,451.99	\$1,045.20	74.6	

Table 5. Effect of Yield on Costs for One Acre of Asparagus in Michigan (1984)

Harvest yield	Variable growing	Variable Harvest	Total variable	Your farm	Overhead cost	Total \$cost	Your farm
Pounds per acre				Cents per pound			
1000	27.2	19.7	46.9		49.8	108.1¢	
1200	22.7	19.7	42.4		41.5	93.4	
1400	19.4	19.7	39.1		43.8	82.9	
1600	17.0	19.7	36.7		38.2	74.9	
1800	15.1	19.7	34.8		34.0	68.8	
2000	13.6	19.7	33.3		30.6	63.9	

Table 6. Soil Buildup Year in Preparation for Planting 10 Acres of Asparagus, Michigan 1984

Operation	Labor			Machinery					Materials			
	Labor per hr.	Wage Rate	Cost	Equipment	Hours of Use	Variable Cost/Unit	Total Variable Cost	Fixed Cost/Unit	Fixed Cost	Item	Cost Per 10 Acres	Total Variable Cost
Soil Buildup												
Soil test	2	\$8.00	\$16.00	Pickup	20mi.	.16	3.20	.38	7.60	2 test@4.50	\$9.00	\$28.20
Lime										3 ton/A@14.00	420.00	420.00
Weed spray	2	8.00	16.00	tractor (60 h.p.) weed sprayer	2hrs. hrs.	6.79 4.88	13.58 9.76	5.93 8.87	11.86 17.74	2 qts. Roundup/ A@\$17.50/qt.	350.00	389.34
Plow	5	8.00	40.00	tractor (80 h.p.) plow	5hrs. 5hrs.	7.02 1.50	35.10 7.50	9.37 2.69	46.85 13.45			82.60
Disc and drag	5	8.00	40.00	tractor (80 h.p.) disc drag	5hrs. 5hrs. 5hrs.	7.02 1.81 1.50	35.10 9.05 7.50	9.37 3.23 2.69	46.85 16.15 13.45			91.65
Seed sorghum	4	8.00	32.00	tractor (60 h.p.) fert. spreader drag	4hrs. 4hrs. 4hrs.	6.79 3.76 1.50	27.16 15.04 6.00	5.93 10.71 2.69	23.72 42.84 10.76	25# sorghum/A @50¢ lb. 400# 17-17-17 @185/ton	125.00 370.00	575.20
Clip cover crop	3	8.00	24.00	tractor (80 h.p.) rotary mower	3hrs. 3hrs.	7.02 1.71	21.06 5.13	9.37 4.02	28.11 12.06			50.19
Disc cover crop	5	8.00	40.00	tractor (80 h.p.) disc	5hrs. 5hrs.	7.02 1.81	35.10 9.05	9.37 3.23	46.85 16.15			84.15
Seed rye or oats	4	8.00	32.00	tractor (60 h.p.) fert. spreader drag	4hrs. 4hrs. 4hrs.	6.79 3.76 1.50	27.16 15.04 6.00	5.93 10.71 2.69	23.72 42.84 10.76	3 bu. oats/A@ 2.00 400# 17-17-17 @185/ton	60.00 370.00	510.20
Management 5 hrs/acre x 8.00			400.00									400.00
Totals Soil Buildup Year			640.00				287.53	(431.76)			1704.00	2631.53

Table 7. Planting Year of 10 Acres of Asparagus, Michigan 1984

Operation	Labor			Equipment	Machinery				Materials			Total Variable Cost
	Labor per hr.	Wage Rate	Cost		Units of Use	Variable Cost/Unit	Total Variable Cost	Fixed Cost/Unit	Fixed Cost	Item	Cost Per 10 Acres	
Planting Year												
Furrowing	4	8.00	\$32	tractor (80 h.p.) plow	4 4	7.02 1.50	28.08 6.00	9.37 2.69	37.48 10.76	250# 18-46-0@ \$250 ton	312.50	378.58
Planting	14	6.00	84	tractor (60 h.p.) fork lift truck	1 1 80mi.	6.79 .75 .39	6.79 .75 31.20	5.93 4.85 .58	5.93 4.85 46.40	12,000 crowns /A@\$30/ 1000	3600.00	3722.74
Covering	4	8.00	32	tractor (60 h.p.) blade	4 4	6.79 .90	27.16 3.60	5.93 9.13	23.72 36.52			62.76
Cultivate 3xplus Side dressing	12	8.00	96	tractor (60 h.p.) cultivator	12 12	6.79 2.05	81.48 24.60	5.93 2.70	71.15 32.40	200# 25-0-15 @150/ton	150.00	352.08
Herbicide spray	2	8.00	16	tractor (60 h.p.) weed sprayer	2 2	6.79 4.88	13.58 9.76	5.93 8.87	11.86 17.74	1/2# Lorox@ 5.00/lb 1 gal. Amiben@ \$15.20/gal	25.00 152.00	216.34
Herbicide spray	2	8.00	16	tractor (60 h.p.) weed sprayer	2 2	6.79 4.88	13.58 9.76	5.93 8.87	11.86 17.74	Ajiben 1 gal/a@ \$15.20 ga.	152.00	191.34
5 Insecticide fungicide sprays	10	8.00	80	tractor (60 h.p.) sprayer	10 10	6.79 4.88	67.90 48.80	5.93 8.87	59.30 88.70	Cutworm insecticide@\$8.00/ Acre materials @\$7.50/A per spray	80.00 375.00	651.70
Chop fern	3	8.00	24	tractor (80 h.p.) rotary mower	3 3	7.02 1.71	21.06 5.13	9.37 4.02	28.11 12.06			50.19
Management 5 hrs/acre		8.00	400									400.00
TOTAL							\$399.23		[516.58]		\$4,846.50	\$6,025.73

Establishment Costs

The establishment costs of a producing asparagus acreage are shown in Tables 6-9. These include one year of soil buildup (Table 6), the planting year (Table 7) and one growing year before harvesting begins (Table 8). The total establishment cost in Table 9 is used in Table 3 to determine interest on establishment cost and to depreciate the establishment cost over 15 years.

Table 8. Growing Year for Establishing 10 Acres of Asparagus, Michigan 1984

Operation	Labor			Machinery					Materials		Cost Per 10 Acres	Total Variable Cost
	Labor per hr.	Wage Rate	Cost	Equipment	Units of Use	Variable Cost/Unit	Total Variable Cost	Fixed Cost/Unit	Fixed Cost	Item		
Growing Year												
Disc and drag	5	8.00	40.00	tractor (80 h.p.)	5	7.02	35.10	9.37	46.85			91.65
				disc	5	1.81	9.05	3.23	16.15			
				drag	5	1.50	7.50	2.69	13.45			
Soil test	2	8.00	16.00	Pickup	20mi.	.16	3.20	.38	7.60	2 tests@4.50	9.00	28.20
Broadcast fertilizer	4	8.00	32.00	tractor (60 h.p.)	4	6.79	27.16	5.93	23.72			520.00
				fertilizer spreader	4	3.76	15.04	10.71	42.84	150# 0-0-60@ \$144/ton	216.00	
										100# N/acre@ .23/lb.	230.00	
Herbicide spray	2	8.00	16.00	tractor (60 h.p.)	2	6.79	13.58	5.93	11.86			
				weed sprayer	2	4.88	9.76	8.87	17.74	18.00 cost/acre	180.00	219.34
Insecticide & fungicide sprays (7x)	14	8.00	112.00	tractor (60 h.p.)	14	6.79	95.06	5.93	83.02			
				sprayer	14	4.88	68.32	8.87	124.18	Insecticide & fungicide@ 7.50/spray/acre plus one cutworm spray @ \$10.00/acre	625.00	900.38
Picking rocks	6	8.00	48.00	tractor (60 h.p.)	6	6.79	40.74	5.93	35.58			89.88
				wagon	6	.19	1.14	4.10	24.60			
Chop fern	3	8.00	24.00	tractor (80 h.p.)	3	7.02	21.06	9.37	28.11			50.19
				rotary mower	3	1.71	5.13	4.02	12.06			
Spot herbicide	2	8.00	16.00	tractor (60 h.p.)	2	6.79	13.58	5.93	11.86			174.34
				weed sprayer	2	4.88	9.76	8.87	17.74	Chemicals@ 13.50 per acre	135.00	400.00
Spray management	5 hrs/acre	8.00	400.00									400.00
TOTAL			\$704.00				\$375.18		\$(517.36)		\$1,395.00	\$2,474.18

**Table 9. Establishment Cost of 10 Acres of Asparagus
Michigan, 1984**

Soil Buildup Year		Your Farm
Variable cost	\$2,631.53	_____
Fixed machinery cost	431.76	_____
Interest on land (\$1000/acre@10%)	1,000.00	_____
Real Estate taxes (\$20/acre)	200.00	_____
Interest on variable and fixed cost (12.5% × 1/2 yr)	191.39	_____
Total Soil Buildup Year	\$4,454.68	_____
Planting year		
Variable cost	\$6,025.73	_____
Fixed machinery cost	516.58	_____
Interest on land (1000/acre@10%)	1,000.00	_____
Real Estate taxes	200.00	_____
Interest on Soil Buildup year cost (4454.68@12.5%)	556.84	_____
Interest on variable and fixed cost (12.5% × 1/2 yr.)	408.89	_____
Total Planting Year	\$8,708.04	_____
Growing year		
Variable cost	\$2,474.18	_____
Fixed machinery cost	517.36	_____
Interest on land (1000/acre@10%)	1,000.00	_____
Real Estate taxes	200.00	_____
Interest on Soil Buildup year cost (4454.68@12.5%)	556.84	_____
Interest on Planting year cost (8708.04@12.5%)	1,088.51	_____
Interest on variable and fixed cost (12.5% × 1/2 year)	186.97	_____
Total Growing Year	6,023.86	_____
TOTAL ESTABLISHMENT COST	19,186.58	_____



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