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COST OF PRODUCING ASPARAGUS IN WESTERN MICHIGAN



By Myron P. Kelsey¹ and Uta Kniese²

This cost evaluation of asparagus production in western Michigan is an update of former studies and a projection of costs developed for 1989 with particular emphasis on the introduction of higher yielding and higher cost hybrid varieties.

These figures do not reflect the average cost of asparagus production for all growers because costs vary considerably from farm to farm. The data can, however, help you develop cost projections and better evaluate your farm. Each of the appropriate tables in this report includes a "Your farm" column for you to note your costs for a particular operation. Where costs cannot be determined, you may wish to adjust and substitute the study data.

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

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. But to allow for differences in the proportion of work performed by regular hired help, which is a cash expense, or by 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 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 Table 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 included in overhead cost only in Table 3.

VARIABLE COSTS

Variable costs are those that change directly with increases or decreases in the acreage or yield of asparagus. Examples of costs that 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 your costs for particular items are substantially higher than those shown, you may need to analyze those components to see if you can reduce them. A high cost for a particular component may be justified if it contributes to a sufficiently higher yield or improved quality.

Nearly all commercial units use a small, gasoline-powered vehicle to carry 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 that 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, some higher or lower costs for some items will be associated with higher or lower yields.

OVERHEAD COSTS

The overhead or fixed costs of asparagus production (Table 3) include 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 depreciation, interest on investment, and insurance and housing costs. Interest, insurance and housing equal 12.7 percent of average value.

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Table 1. Variable growing cost for 10 acres of asparagus in Michigan, 1989.

Operation	Labor				Machinery				Materials				
	Labor (hrs)	Wage rate	Cost	Equipment	Hours of use	Unit var. cost	Total var. cost	Fixed unit cost	Total fixed cost	Item	Cost per 10 acres	Total variable cost	Your farm cost
Harvest Year													
Fertilizer: broadcast	4	\$8.00	\$32.00	Tractor (60 hp) Fertilizer spreader	4	6.79 3.76	27.16 15.04	5.93 10.71	23.72 42.84	250 lb. 0-0-60/acre @ \$144/ton 150 lb. actual N/acre @ \$.23/lb	\$180.00 \$345.00	\$599.20	
2nd fertilizer application and cultivate	4	\$8.00	\$32.00	Tractor (60 hp) Cultivator and attachments	4	6.79 2.05	27.16 8.2	5.93 2.7	23.72 10.8	100 lb. 18-46-0 per acre @ \$250/ton	125	192.36	
Herbicide sprays (2x)	4	8	32	Tractor (60 hp) Weed sprayer	4	6.79 4.88	27.16 19.52	5.93 8.87	23.72 35.48	Chemicals \$18/acre 1st spray \$20/acre second spray	\$180.00 \$200.00	\$458.68	
Insecticide and Fungicide Sprays (6x)	12	\$8.00	\$96.00	Tractor (60 hp) Sprayer	12	6.79 4.88	81.48 58.56	5.93 8.87	71.16 106.44	Materials @ \$7.50/spray/acre + 1 cutworm spray @ \$10/acre	\$550.00 \$50.19	\$836.23	
Chop fern	4	\$8.00	\$32.00	Tractor (80 hp) Rotary mower	3	7.02 1.71	21.06 5.13	9.37 4.02	28.11 12.06		\$68.00	\$105.13	
Add lime	5	8	40	Tractor (60 hp) Fertilizer spreader	5	6.79 3.76	33.95 18.8	5.93 10.71	29.65 53.55	one ton lime/acre @ \$14/ton	\$140.00	\$232.75	
Management 5 hrs/acre	50	\$8.00	\$400.00								\$400.00		
			\$664.00				343.22		461.25		\$1,838.19	\$2,824.35	

Table 2. Variable harvest cost for 10 acres of asparagus
(1,400 lb/acre), Michigan, 1989.

	Units	Rate	Total	Your farm
Labor				
regular (hr)	90	\$6.00	\$540.00	-----
piecework (lb/A)	1,400	\$0.11	\$1,540.00	-----
management (hr)	50	\$8.00	\$400.00	-----
Equipment use:				
Tractor -- 60 hp (hr)	10	\$6.79	\$67.90	-----
S.P.picker aid (hr)	70	\$2.08	\$145.60	-----
Forklift (hr)	10	\$0.75	\$7.50	-----
Truck (miles)	200	\$0.28	\$56.00	-----
Total variable cost			\$2,757.00	-----
Variable harvest cost per acre			\$275.70	-----
Variable harvest cost per pound (1,400 lb/A)			\$0.20	-----

Table 3. Overhead cost per 10 acres of asparagus, Michigan, 1989.

Item	Total	Your farm
Equipment, growing	\$461.25	-----
Equipment, harvest	\$527.60	-----
Interest on one-half harvest year's growing cost ((\$2,824.35 @ 10% x 1/2 yr)	\$141.22	-----
Interest on land (\$1,000/acre @ 10%)	\$1,000.00	-----
Interest on avg. value of estab. cost ((\$21,587.97 @ 10%)	\$1,079.40	-----
Depreciation of establishment cost ((\$21,587.97 over 15 years)	\$1,439.20	-----
Real estate taxes @ \$20/acre	\$200.00	-----
Marketing MACMA @ \$7.50/ton	\$52.50	-----
Promotion (1% of gross)	\$77.00	-----
Festival fee	\$10.00	-----
Total overhead cost	\$4,988.16	-----
Overhead cost per acre	\$498.82	-----
Total cost per pound (1,400 lb/A)	\$0.36	-----

Table 4. Total cost of production of 10 acres of asparagus
(1,400 lb/acre), Michigan, 1989.

	Total	Your farm
Variable growing cost	\$2,824.35	-----
Variable harvest cost	\$2,757.00	-----
Overhead cost	\$4,988.16	-----
Total cost	\$10,569.51	-----
Total cost per pound	\$0.75	-----

TABLE 5. Effect of varying yield on cost/lb for asparagus, Michigan, 1989.

Yield/acre	Variable		Total variable cost	Your farm	Overhead cost	Total cost	Your farm
	Growing cost	Harvest cost					
Cents per pound							
1,000	0.282	0.197	0.479	-----	0.499	0.978	-----
1,200	0.235	0.197	0.432	-----	0.416	0.848	-----
1,400	0.202	0.197	0.399	-----	0.356	0.755	-----
1,600	0.177	0.197	0.374	-----	0.312	0.685	-----
1,800	0.157	0.197	0.354	-----	0.277	0.631	-----
2,000	0.141	0.197	0.338	-----	0.249	0.588	-----
2,500	0.113	0.197	0.310	-----	0.200	0.510	-----
3,000	0.094	0.197	0.291	-----	0.166	0.457	-----
3,500	0.080	0.197	0.278	-----	0.143	0.420	-----
4,000	0.070	0.197	0.268	-----	0.125	0.392	-----
4,500	0.062	0.197	0.260	-----	0.111	0.371	-----
5,000	0.056	0.197	0.253	-----	0.100	0.353	-----

Table 6. Soil buildup year in preparation for planting asparagus, Michigan, 1989.

Operation	Labor (hrs)	Wage rate	Cost	Equipment	Hours of use	Machinery			Materials			Total variable cost	Your farm
						Unit var. cost	Total var. cost	Fixed unit cost	Total fixed cost	Item	Cost per 10 acres		
Soil test	2	\$8.00	\$16.00	Pickup	20ml	0.16	3.20	0.38	7.60	2 Test @ \$4.50	\$9.00	\$28.20	
Lime										3 tons/acre @ \$14	\$420.00	\$420.00	
Weed spray	2	\$8.00	\$16.00	Tractor (60 hp) Weed sprayer	2	6.79	13.58	5.93	11.86	17.74	2qt. roundup/acre @ \$17.50/qt.	\$350.00	\$389.34
Plow	5	\$8.00	\$40.00	Tractor (80 hp) Plow	5	7.02	35.10	9.37	46.85			\$82.60	
Disk and drag	5	\$8.00	\$40.00	Tractor (80 hp) Disk Drag	5	7.02	35.10	9.37	46.85			\$91.65	
Seed sorghum	4	\$8.00	\$32.00	Tractor (60 hp) Fertilizer spreader Drag	4	6.79	27.16	5.93	23.72	42.84	25 lb. sorghum/acre @ \$0.50/lb. 400 lb. 17-17-17 @ \$185/ton	\$125.00 \$370.00	\$575.20
Clip cover crop	3	\$8.00	\$24.00	Tractor (80 hp) Rotary mower	3	7.02	21.06	9.37	28.11			\$50.19	
Disk cover crop	5	\$8.00	\$40.00	Tractor (80 hp) Disk	5	7.02	35.10	9.37	46.85			\$84.15	
Seed rye or oats	4	\$8.00	\$32.00	Tractor (60 hp) Fertilizer spreader Drag	4	6.79	27.16	5.93	23.72	42.84	3 bu. oats/acre @ \$2.00 400 lb. 17-17-17 @ \$185/ton	\$60.00 \$370.00	\$510.20
Management & labor supervision	30	\$8.00	\$240.00									\$240.00	
TOTAL soil buildup year	60		\$480.00				\$287.53		\$431.76			\$1,704.00	\$2,471.53

Table 7. Planting year of 10 acres of asparagus, Michigan, 1989.

Operation	Labor				Machinery				Materials				
	Labor (hrs)	Wage rate	Cost	Equipment	Hours of use	Unit var. cost	Total var. cost	Fixed unit cost	Total fixed cost	Item	Cost per 10 acres	Total variable cost	Your farm
Furrowing	4	\$8.00	\$32.00	Tractor (80 hp)	4	7.02	\$28.08	9.37	\$37.48				
				Plow	4	1.50	\$6.00	2.69	\$10.76	250 lb. 18-46-0 @ \$250/ton	\$312.50	\$378.58	
Planting	14	\$6.00	\$84.00	Tractor (60 hp)	1	6.79	\$6.79	5.93	\$5.93				
				Fork lift	1	0.75	\$0.75	4.85	\$4.85	8000 crowns/acre @ \$80/1000	\$6,400.00	\$6,522.74	
				Truck	80mi	0.39	\$31.20	0.58	\$46.40				
Covering	4	\$8.00	\$32.00	Tractor (60 hp)	4	6.79	\$27.16	5.93	\$23.72				
				Blade	4	0.90	\$3.60	9.13	\$36.52			\$59.16	
Cultivate 3x + side dressing	12	\$8.00	\$96.00	Tractor (60 hp)	12	6.79	\$81.48	5.93	\$71.16				
				Cultivator	12	2.05	\$24.60	2.70	\$32.40	200 lb. 25-0-15 @ \$150/ton	\$150.00	\$352.08	
Herbicide spray	2	\$8.00	\$16.00	Tractor (60 hp)	2	6.79	13.58	5.93	11.86	1/2 lb. Lorox @ \$5.00/lb.	\$25.00		
				Weed sprayer	2	4.88	9.76	8.87	17.74	1 gal Amiben @ \$ 15.20/gal.	\$152.00	\$216.34	
Herbicide spray	2	\$8.00	\$16.00	Tractor (60 hp)	2	6.79	13.58	5.93	11.86				
				Weed sprayer	2	4.88	9.76	8.87	17.74	Ajiben 1 gal./acre @ \$15.20/gal	\$152.00	\$191.34	
Insecticide/fungicide sprays (5)	10	\$8.00	\$80.00	Tractor (60 hp)	10	6.79	67.90	5.93	59.30	Outworm insecticide @ \$8.00/A	\$80.00		
				Weed sprayer	10	4.88	48.80	8.87	88.70	Materials @ \$7.50/acre	\$375.00	\$651.70	
Chop fern	3	\$8.00	\$24.00	Tractor (80 hp)	3	7.02	21.06	9.37	28.11				
				Rotary mower	3	1.71	5.13	4.02	12.06			\$50.19	
Management & labor supervision	50	\$8.00	\$400.00									\$400.00	
TOTAL	101		\$780.00				\$399.23		\$516.59		\$7,709.26	\$8,822.13	

Table 8. Growing year for establishing 10 acres of asparagus, Michigan, 1989.

Operation	Labor				Machinery				Materials				
	Labor (hrs)	Wage rate	Cost	Equipment	Hours of use	Unit var. cost	Total var. cost	Fixed unit cost	Total fixed cost	Item	Cost per 10 acres	Total variable cost	Your farm
Disk and drag	5	\$8.00	\$40.00	Tractor (80 hp)	5	7.02	35.10	9.37	46.85				
				Disk	5	1.81	9.05	3.23	16.15				
				Drag	5	1.50	7.50	2.69	13.45				\$91.65
Soil test	2	\$8.00	\$16.00	Pickup	20ml	0.16	3.20	0.38	7.60	2 Tests @ \$4.50	\$9.00	\$28.20	
Fertilizer: broadcast	4	\$8.00	\$32.00	Tractor (60 hp)	4	6.79	27.16	5.93	23.72	150 lb. 0-0-60 @ \$144/ton	\$216.00		
				Fertilizer spreader	4	3.76	15.04	10.71	42.84	100 lb. N/acre @ \$.23/lb	\$230.00	\$520.20	
Herbicide spray	2	\$8.00	\$16.00	Tractor (60 hp)	2	6.79	13.58	5.93	11.86				
				Weed sprayer	2	4.88	9.76	8.87	17.74	\$18.00/acre	\$180.00	\$219.34	
Insecticide/fungicide sprays (7)	14	\$8.00	\$112.00	Tractor (60 hp)	14	6.79	95.06	5.93	83.02	Insect. & fung. @ \$7.50/spray/A	\$625.00	\$900.38	
				Weed sprayer	14	4.88	68.32	8.87	124.18	One cutworm spray @ \$10.00/A	\$625.00	\$900.38	
Picking rocks	6	\$8.00	\$48.00	Tractor (60 hp)	6	6.79	40.74	5.93	35.58				\$89.88
				Wagon	6	0.19	1.14	4.10	24.60				
Chop fern	3	\$8.00	\$24.00	Tractor (80 hp)	3	7.02	21.06	9.37	28.11				
				Rotary mower	3	1.71	5.13	4.02	12.06				\$50.19
Spot herbicide	2	\$8.00	\$16.00	Tractor (60 hp)	2	6.79	13.58	5.93	11.86				
				Weed sprayer	2	4.88	9.76	8.87	17.74	Chemicals @ \$13.50/acre	\$135.00	\$174.34	
Management & labor supervision	50	\$8.00	\$400.00									\$400.00	
TOTAL	88		\$704.00				\$375.18		\$517.36		\$1,395.00	\$2,474.18	

A major component of overhead cost is depreciation of the establishment costs from Table 9 spread over 15 years. Interest is also a major cost and is calculated on one-half the growing year's expenses, the average establishment cost and the real estate investment. If you wish to evaluate interest as a return, divide the net income by your investment to determine a rate earned on investment. This procedure also needs to recognize, however, that the operator's labor may not have been included in costs so net income represents a return to labor, management and investment.

You need to decide whether to consider fixed costs as part of the total cost for decision-making purposes. For instance, real estate overhead is a fixed cost if you own an asparagus acreage, but rent is a variable cost if you lease acreage.

PRODUCTION COSTS PER HUNDREDWEIGHT

Per-acre yields are very important in determining cost per hundred-weight (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. In Table 4, the current state average yield of 1,400 pounds was

assumed. As shown in the last column of Table 5, the 75 cents per pound cost declines rapidly as yields increase, as should happen with the new hybrid varieties. Yields twice the current level, which are easily obtainable with the hybrid varieties, would bring total costs down to between 45 and 50 cents per pound.

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 as summarized in Table 9 includes the variable costs as outlined in Tables 6-8 plus fixed costs and interest. The total establishment cost is used in Table 3 to determine interest and depreciation.

You may wish to evaluate these costs by substituting your costs in the "Your farm" columns.

Table 9. Establishment cost of 10 acres of asparagus, Michigan, 1989.

		Your farm
Soil buildup year		
Variable cost	\$2,471.53	-----
Fixed machinery cost	\$431.76	-----
Interest on land (\$1,000/acre @ 10%)	\$1,000.00	-----
Real estate taxes (\$20/acre)	\$200.00	-----
Interest on variable and fixed cost (10% x 1/2 year)	\$145.16	-----
Total soil buildup year	\$4,248.45	
Planting year		
Variable cost	\$8,822.13	-----
Fixed machinery cost	\$516.59	-----
Interest on land (\$1,000/acre @ 10%)	\$1,000.00	-----
Real estate taxes (\$20/acre)	\$200.00	-----
Interest on soil buildup year cost (\$4,248.45 @ 10%)	\$424.85	-----
Int. on planting year var. and fixed cost (10% x 1/2 year)	\$466.94	-----
Total planting year	\$11,430.50	
Growing year		
Variable cost	\$2,474.18	-----
Fixed machinery cost	\$517.36	-----
Interest on land (\$1,000/acre @ 10%)	\$1,000.00	-----
Real estate taxes (\$20/acre)	\$200.00	-----
Interest on soil buildup year cost (\$4,248.45 @ 10%)	\$424.85	-----
Interest on planting year cost (\$11,430.50 @ 10%)	\$1,143.05	-----
Int. on growing year var. and fixed cost (10% x 1/2 year)	\$149.58	-----
Total growing year	\$5,909.01	
Total establishment cost	\$21,587.97	



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