

Sugar Beet Enterprise Costs and Returns

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A three-year study was initiated in 1969 and completed in 1971 to update costs and returns data for sugar beet production. Data for this study were supplied by cooperating beet growers through the Extension Farm Records Mail-In program at North Dakota State University. The study was a cooperative effort of the Red River Valley Sugar Beet Growers Association and the NDSU Extension Agricultural Economics section, and was undertaken at the request of the Growers Association. This report summarizes the data for the three-year study.

About 60 cooperators were contacted at the start of the study with complete records obtained from 30 cooperators the first year, 27 the second year and 22 the third year. Eight to 10 growers supplied incomplete data for each of these years. Some cooperators dropped out or supplied only partial records, chiefly because of the demand on their time to provide the detailed records needed.

Detailed records included all receipts and expenses for the farm, all labor use by enterprise, and all machinery use by enterprise. Expenses directly attributable to sugar beets were recorded as such. Machinery expenses, such as depreciation, repairs, fuel and oil, etc., were prorated to sugar beets by using the percentage of total time a machine was used for beets. For example, if a tractor was used 30 per cent of the total hours operated during the year for sugar beets, then 30 per cent of its costs were allocated to beets.

Hired labor costs were also divided according to the proportion of time spent on the sugar beet enterprise.

Data presented in the following tables represent the average for three years. Data are tabulated for the average of all farms and for farms grouped according to number of actual beet acres grown. Farmers were originally selected to participate in this study according to the number of acres planted. Presenting the information by size of beet acreage will allow the individual grower to compare his costs with those of his corresponding size group.

The number of farms included in each size category for 1969, 1970 and 1971 respectively were: (1) 50-99 acres, 12, 11, 11; (2) 100-149 acres, 6, 4, 2; (3) 150-199 acres, 6, 6, 6; and (4) 200 acres and over, 6, 6, 3.

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Table 1 summarizes sugar beet costs and returns on a per-acre basis. Table 2 provides the same information on a per-ton basis. The data in Tables 1 and 2 are divided into the following four sections: Size of Business, Costs and Returns, Returns to Labor and Management, and Machinery Investment and Costs.

Size of Business

This section of both tables gives the average number of sugar beet acres and summerfallow acres per farm. Not all beets were produced on summerfallow, but the fallow acres are only slightly less than the beet acres. Investment in land represents both the acres on which beets were grown plus the acres of fallow used. The average value of land is \$227.41 per acre. The investment in machinery is the average annual investment. The hours of operator and family labor are given as reported by the cooperators. The average yield for the three-year period was 13.02 tons per acre. The average yield for all farms was 13.83 tons per acre in 1969, 10.49 in 1970, and 15.46 in 1971.

Costs and Returns

1. Cash Costs

The costs for hired labor, as distinguished from thinning labor, are prorated on the basis of labor records. No costs are used in this study for hours of operator or family labor. Thinning labor, as used in this report, means migrant or other workers who were hired only to weed and thin beets.

Fuel costs were prorated based on the per cent use of trucks and tractors for beets, and were reviewed and adjusted by the cooperators.

Repair costs for machinery used only for beets were billed directly to the beet enterprise. Machinery repairs were prorated for multipurpose items. Building repairs and utilities apply mainly to tenant housing.

Seed and fertilizer expenses are listed separately from other crop expenses. "Other" crop expenses include weed sprays, insecticides, crop insurance, and labor supplies such as hoes.

Machine hire is custom work hired. Some custom costs are also included in other crop expenses, such as fees for spraying when not separated from the actual chemicals purchased.

Taxes and interest were estimated by the cooperators and prorated to the beet enterprise. Interest on operating loans does not include machinery purchases.

Miscellaneous costs include items such as truck licenses and insurance, grower association dues, freight, meeting expenses, labor procurement

Table 1. Sugar beet costs and returns per beet acre, 3-year average of all farms and by beet acre size groups. (1969, 1970, 1971).

	3-Year Average Per Beet Acre				
	All Farms	50-99A.	100-149A.	150-199A.	200A & Over
I. Size of Business					
Sugar beet acres per farm	134.68	73.31	117.75	164.92	251.07
Fallow acres per farm	130.35	72.57	117.75	159.59	236.33
Total investment	\$576.52	\$606.09	\$542.82	\$533.55	\$603.47
Land	\$447.31	\$457.39	\$439.45	\$396.62	\$483.54
Buildings	\$ 14.65	\$ 19.77	\$ 9.65	\$ 16.95	\$ 11.33
Machinery	\$114.56	\$128.93	\$ 93.72	\$119.97	\$108.59
Hours operator labor	3.84	.6.13	3.92	2.89	3.07
Hours family labor	.67	1.20	1.02	.77	.12
Yield—tons per acre	13.02	13.20	14.05	13.84	11.88
II. Costs and Returns					
Cash Costs					
Hired labor	\$ 6.85	\$ 2.28	\$ 9.18	\$ 5.52	\$ 10.06
Thinning labor	\$ 27.25	\$ 29.22	\$ 29.04	\$ 25.39	\$ 26.74
Fuel, oil	\$ 9.31	\$ 9.36	\$ 9.96	\$ 10.57	\$ 8.04
Machinery repair	\$ 7.63	\$ 7.45	\$ 7.22	\$ 9.46	\$ 6.46
Building repair	\$.40	\$.58	\$.01	\$.28	\$.52
Building utilities	\$.15	\$.20	\$.15	\$.13	\$.13
Seed	\$ 2.99	\$ 3.18	\$ 2.69	\$ 3.10	\$ 2.88
Fertilizer	\$ 10.04	\$ 11.18	\$ 9.07	\$ 11.79	\$ 8.27
Other crop expense	\$ 5.41	\$ 5.99	\$ 3.58	\$ 5.95	\$ 5.28
Machine hire	\$ 2.27	\$ 4.96	\$ 1.96	\$.81	\$ 1.75
Interest - oper. loans	\$ 3.91	\$ 4.63	\$ 2.02	\$ 2.22	\$ 5.46
Miscellaneous	\$ 7.20	\$ 12.25	\$ 7.00	\$ 4.19	\$ 6.30
TOTAL	\$ 83.40	\$ 91.26	\$ 81.88	\$ 79.42	\$ 81.89
Cash Income					
Beets sold	\$211.82	\$217.61	\$220.88	\$216.15	\$198.13
Custom work	\$ 2.10	\$ 3.59	\$ 1.47	\$ 2.52	\$ 1.01
Hauling allowance	\$.35	\$.08	\$.00	\$ 1.09	\$.07
Gross income	\$214.26	\$221.27	\$222.35	\$219.76	\$199.21
Cash costs	\$ 83.40	\$ 91.26	\$ 81.88	\$ 79.42	\$ 81.89
Depreciation	\$ 11.19	\$ 14.04	\$ 12.13	\$ 9.42	\$ 10.35
Net income	\$111.93	\$109.13	\$120.27	\$122.78	\$ 99.08
III. Returns to Labor & Management					
Gross income	\$214.26	\$221.27	\$222.35	\$219.76	\$199.21
Cash costs	\$ 83.40	\$ 91.26	\$ 81.88	\$ 79.42	\$ 81.89
Fixed costs:					
Depreciation	\$ 11.19	\$ 14.04	\$ 12.13	\$ 9.42	\$ 10.35
Land charge*	\$ 39.34	\$ 39.80	\$ 40.00	\$ 39.35	\$ 38.82
Interest on investment**	\$ 8.97	\$ 10.41	\$ 7.24	\$ 9.58	\$ 8.39
Total costs	\$142.90	\$155.51	\$141.35	\$137.77	\$139.45
Return to labor and management	\$ 71.36	\$ 65.76	\$ 81.10	\$ 81.99	\$ 59.76
IV. Machinery Investment & Costs					
Total machine investment	\$114.55	\$128.93	\$ 93.72	\$119.97	\$108.59
Tractors	\$ 37.36	\$ 41.15	\$ 31.06	\$ 39.63	\$ 35.44
Trucks	\$ 32.77	\$ 38.61	\$ 28.17	\$ 32.03	\$ 31.21
Tillage equipment	\$ 15.35	\$ 17.51	\$ 13.51	\$ 16.32	\$ 13.85
Planting equipment	\$ 5.63	\$ 8.86	\$ 3.89	\$ 5.52	\$ 4.23
Harvesting equipment	\$ 23.43	\$ 22.79	\$ 17.09	\$ 26.47	\$ 23.85
Total costs	\$ 27.58	\$ 31.59	\$ 29.25	\$ 26.91	\$ 24.81
Repairs	\$ 7.63	\$ 7.45	\$ 7.22	\$ 9.46	\$ 6.46
Depreciation	\$ 11.19	\$ 14.04	\$ 12.13	\$ 9.42	\$ 10.35
Fuel and oil					
(less tax refund)	\$ 8.59	\$ 8.74	\$ 9.42	\$ 9.74	\$ 7.25
Net custom work	\$.17	\$ 1.36	\$.48	\$ -1.71	\$.75

*Based on \$20 per acre \times $\frac{(\text{total beet acres} + \text{total fallow acres})}{\text{total beet acres}}$

**Interest on investment in machinery and buildings at 7%

Table 2. Sugar beet costs and returns per ton, 3-year average of all farms and by beet acre size groups, (1969, 1970, 1971).

	3-Year Average Per Ton				
	All Farms	50-99A.	100-149A.	150-199A.	200A & Over
I. Size of Business					
Total investment	\$ 44.27	\$ 45.93	\$ 38.62	\$ 38.55	\$ 50.82
Land	\$ 34.35	\$ 34.66	\$ 31.26	\$ 28.66	\$ 40.72
Buildings	\$ 1.12	\$ 1.50	\$.69	\$ 1.22	\$.96
Machinery	\$ 8.80	\$ 9.77	\$ 6.67	\$ 8.67	\$ 9.14
Hours operator labor	.29	.46	.28	.21	.26
Hours family labor	.05	.09	.07	.06	.01
II. Costs and Returns					
Operating costs					
Hired labor	\$.53	\$.17	\$.65	\$.40	\$.85
Thinning labor	\$ 2.09	\$ 2.21	\$ 2.07	\$ 1.83	\$ 2.25
Fuel, oil	\$.72	\$.71	\$.71	\$.76	\$.68
Machinery repair	\$.59	\$.56	\$.51	\$.68	\$.54
Building repair	\$.03	\$.04	\$.00	\$.02	\$.04
Building utilities	\$.01	\$.01	\$.01	\$.01	\$.01
Seed	\$.23	\$.24	\$.19	\$.22	\$.24
Fertilizer	\$.77	\$.85	\$.65	\$.85	\$.70
Other crop expense	\$.42	\$.45	\$.26	\$.43	\$.44
Machine hire	\$.17	\$.38	\$.14	\$.06	\$.15
Interest on oper. loans	\$.30	\$.35	\$.14	\$.16	\$.46
Miscellaneous	\$.55	\$.93	\$.50	\$.30	\$.53
TOTAL	\$ 6.41	\$ 6.92	\$ 5.83	\$ 5.75	\$ 6.89
Cash Income					
Beets sold	\$ 16.26	\$ 16.49	\$ 15.72	\$ 15.62	\$ 16.68
Custom work	\$.16	\$.27	\$.10	\$.18	\$.08
Hauling allowance	\$.03	\$.01	\$.00	\$.08	\$.01
Gross income	\$ 16.45	\$ 16.77	\$ 15.82	\$ 15.88	\$ 16.77
Cash costs	\$ 6.41	\$ 6.92	\$ 5.83	\$ 5.75	\$ 6.89
Depreciation	\$.86	\$ 1.06	\$.86	\$.68	\$.87
Net income	\$ 9.18	\$ 8.79	\$ 9.13	\$ 9.45	\$ 9.01
III. Returns to Labor & Management					
Gross income	\$ 16.45	\$ 16.77	\$ 15.82	\$ 15.88	\$ 16.77
Cash costs	\$ 6.41	\$ 6.92	\$ 5.83	\$ 5.75	\$ 6.89
Fixed costs:					
Depreciation	\$.86	\$ 1.06	\$.86	\$.68	\$.87
Land charge	\$ 3.02	\$ 3.02	\$ 2.85	\$ 2.84	\$ 3.27
Interest on investment	\$.69	\$.79	\$.51	\$.69	\$.71
Total costs	\$ 10.98	\$ 11.79	\$ 10.05	\$ 9.96	\$ 11.74
Return to labor and management	\$ 5.47	\$ 4.98	\$ 5.77	\$ 5.92	\$ 5.03
IV. Machinery Investment & Costs					
Total investment	\$ 8.80	\$ 9.77	\$ 6.67	\$ 8.67	\$ 9.14
Tractors	\$ 2.87	\$ 3.12	\$ 2.21	\$ 2.86	\$ 2.98
Trucks	\$ 2.52	\$ 2.93	\$ 2.00	\$ 2.31	\$ 2.63
Tillage equipment	\$ 1.18	\$ 1.33	\$.96	\$ 1.18	\$ 1.17
Planting equipment	\$.43	\$.67	\$.28	\$.40	\$.36
Harvesting equipment	\$ 1.80	\$ 1.73	\$ 1.22	\$ 1.91	\$ 2.01
Total costs	\$ 2.12	\$ 2.39	\$ 2.08	\$ 1.94	\$ 2.09
Repairs	\$.59	\$.56	\$.51	\$.68	\$.54
Depreciation	\$.86	\$ 1.06	\$.86	\$.68	\$.87
Fuel & oil	\$.66	\$.66	\$.67	\$.70	\$.61
Net custom	\$.01	\$.10	\$.03	\$ -.12	\$.06

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fees, insurance on tenant housing, postage, machinery lease, etc.

2. Cash Income

Income from beets sold averaged \$16.27 per ton, including government payments.

Income from custom work done for others in producing and harvesting beets is included in gross enterprise income.

Some farmers received and reported a hauling allowance from the factory for hauling beets beyond a base distance. This is listed as a small part of the gross income.

Cash costs and depreciation on machinery were deducted from gross income to obtain net enterprise income.

Return to Labor and Management

To obtain the returns to labor and management, a charge of \$20 per acre was made against land, and a charge of 7 per cent was levied against investment in machinery and buildings. These charges and the cash costs and depreciation were deducted from gross enterprise income to obtain the residual figure, return to labor and management.

If desired, hourly wages can be assigned to operator and family labor and multiplied times the hours used on the sugar beet enterprise, and this labor cost then deducted from return to labor and management to obtain the return to management.

The total cost of producing beets of \$142.90 per acre is \$4.82 higher than the research results obtained in 1968.¹ The present study showed about \$4 greater cash costs and about \$3 lower fixed costs per acre than the 1968 study.

Machinery Investment and Costs

Machinery investment per beet acre was \$114.55, based on current value. Some growers felt that it should be higher because of the need for big trucks which would not be necessary if beets were not grown. Investment was prorated for all machinery, including trucks, based on the percentage of total time that the machines were used for beets. In the case of planting and harvesting equipment it was not necessary to prorate since these machines were specialized beet equipment.

Total cost of operating machinery was \$27.58 per beet acre for the three years. Depreciation is the largest cost item, followed by fuel and oil, repairs and net custom cost. The net custom cost was obtained by subtracting income from custom work from payments for custom work. A positive figure indicates more custom work hired than was done for others. A negative figure means more custom work was done off the farm than was hired done on the farm.

¹Donald Hofstrand and Dale O. Anderson, 1970, "Sugarbeet Production Costs and Practices in the Red River Valley", North Dakota Farm Research, 27:6.