

Utah State University

DigitalCommons@USU

Utah Resources Series

Utah Agricultural Experiment Station

1964

Sugar Beet Production in Utah: Cost and Net Return 1945-1963

Earnest M. Morrison
Utah State University

Follow this and additional works at: https://digitalcommons.usu.edu/uas_resources



Part of the [Agriculture Commons](#)

Recommended Citation

Morrison, Earnest M., "Sugar Beet Production in Utah: Cost and Net Return 1945-1963" (1964). *Utah Resources Series*. Paper 8.

https://digitalcommons.usu.edu/uas_resources/8

This Report is brought to you for free and open access by the Utah Agricultural Experiment Station at DigitalCommons@USU. It has been accepted for inclusion in Utah Resources Series by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



SUGAR BEET PRODUCTION IN UTAH

**COST
AND
NET
RETURN
1945-1963**

EARNEST M. MORRISON

**UTAH RESOURCES SERIES 21
AGRICULTURAL
EXPERIMENT STATION
UTAH STATE UNIVERSITY
- LOGAN**

UTAH STATE UNIVERSITY



3 9060 02001 9005

18.4

no. 21

SUGAR BEET PRODUCTION IN UTAH

cost and net return, 1945-1963

Earnest M. Morrison

For a number of years the Agricultural Experiment Station has measured and reported the costs and returns in the production of the important agricultural enterprises on Utah farms. These studies have been initiated by a detailed investigation of a sufficient number of farms to reflect the average conditions of the enterprise under study. In each succeeding year sufficient additional field and other data are collected to reflect the changes in prices, costs, and method of production to determine the current costs and returns for that year. Periodically detailed studies have been repeated for each enterprise and the data kept current by the method described above.

One of the major objectives of this type of activity has been to obtain information that would be useful to individuals and groups who are interested in the production, processing, and marketing of agricultural products.

In this report two types of data are presented. First, costs of production are reported holding size of enterprise and yield per acre constant. Second, data are reported for the years the detailed studies were made. This allows changes in size of enterprise and yield to be considered.

Trends in Cost of Production

The trend in cost of production of sugar beets is shown in table 1 for 1945 to 1963. The information reported is based on enterprise studies as described above. The figures are based on

a constant yield of 15.2 tons per acre for 11 acre fields. These were the average yield per acre and the average acres per field in the original survey. Since that study resulted in physical quantities and cost of inputs associated with an average of 11 acres per field and 15.2 tons of beets changes in total cost of production can be calculated by applying appropriate price changes to each input. This method of reporting does not show the exact returns for a particular year if the yield per acre was greatly different from the constant yield figure used. The figures thus reported have the advantage of measuring only trends in the contract price of the crop and the cost of producing the product. These figures make the data more comparable over the years reported and serve as a basis for predicting the possible relative profitableness of a particular crop. For the 19-year period 1945-1963, the average yield per acre was 15.5 tons of beets compared to the constant yield of 15.2 tons per acre.

Total receipts were calculated by multiplying the average price reported by the State Agricultural Statistician times the stated constant yield and adding the growers' estimates of the value of the tops for feed or fertilizer which, as a general rule, are based on the values growers can obtain by renting their fields to livestock feeders. The grower's valuation of tops was more dependant upon his opportunity to use the tops than upon the actual amount of tops produced. Prices for 1963 are preliminary at this time.

Table 1. Cost and net return per acre from the production of sugar beets, 1945 to 1963, Utah. Constant yield of 15.2 tons per acre, 11 acres per enterprise*

Year	Total receipts†	Cost of production				Total	Net return
		Material	Overhead	Labor	Power		
				dollars			
1945	188	14	26	73	21	134	54
1946	203	15	27	90	24	156	47
1947	219	15	29	95	28	167	52
1948	199	16	32	101	28	177	22
1949	199	16	31	100	27	174	25
1950	214	16	32	86	44	178	36
1951	221	21	33	69	51	174	47
1952	228	21	33	70	54	178	50
1953	217	22	34	68	60	184	33
1954	212	22	33	68	60	183	29
1955	215	21	34	64	60	179	36
1956	225	22	34	61	63	180	45
1957	223	23	34	63	66	186	37
1958	225	22	34	65	65	186	39
1959	225	22	35	68	66	191	34
1960	217	22	37	69	66	194	23
1961	221	22	37	70	67	196	25
1962	254	23	39	72	68	202	52
1963	246‡	24	42	72	69	207	39

*See definition of enterprise on page 3.

†Includes value of tops.

‡Preliminary.

Note: The value of this table comes from presenting the 19 year trend in costs, receipts, and net return when yield has been held constant. To the extent that the yield in a given year was different from 15.2 tons per acre these figures will not show that year's average receipts or net returns. The average yield over the 19 year period 1945-63 was 15.5 tons or within .3 ton per acre of the constant yield on which these data are based.

Total cost includes cost of the operator's own capital, land, and labor and all other costs except specific allowances for risk, management, a pro rata share of the general farm overhead expense, and any net depreciation in the land as a result of having grown the crop.

Material cost includes fertilizer, seed, spray, fees such as dues to sugar

beet growers' associations, machine hire, and other miscellaneous items.

Overhead cost includes interest on money invested in the crop for operating expense and interest on capital at 5 percent, building and equipment upkeep, and depreciation, taxes, water, and drainage.

Labor cost includes value of the

operator's time, the operator's family labor, and all hired labor.

Power cost includes cost of using horses and operating tractors and trucks plus the cost of equipment used with tractors.

The trends in labor and power costs reflect the increased adoption of mechanical methods of growing and harvesting sugar beets. The decrease in labor cost is the result of lower labor requirement and the increase in power cost is the result of greater use of machines and of higher operating costs for power equipment. Physical labor requirements have been reduced even further than the cost figure indicates since wage rates have increased during this period.

Detailed Studies

Major economic studies of sugar beet production were conducted in 1945, 1951, 1959, and 1963. Since the detailed reports of these studies are now out of print, a summary is presented in table 2.

The data for detailed studies were obtained from sugar beet growers and are based on their best information. No effort was made to choose any particular farmer for a report. Areas of concentration of sugar beet production were located and an attempt made to obtain records at random in the areas. Additional records were selected until some key measures tended to become relatively stable. In all studies acreages less than five were not included. The intention has been for the survey to include only those enterprises that challenge the producer to do a reasonably good job of production. For this reason small acreages have been eliminated in an effort to minimize the chances for including neglected acreages, those having the aspects of a hobby enterprise, or those so relatively unimportant to the farmer

that he hasn't been alert or observing of the crop requirements or of his practices.

A sugar beet enterprise was defined to include all the acres under the control of the farm operator that were on about the same quality of soil and given the same treatment by the operator. If there were basic differences in soil or practices, more than one enterprise existed on one farm and either more than one schedule was taken or one schedule was taken for that part of the sugar beet effort that could qualify as an enterprise by the conditions stated above. The enterprise included all the acres prepared and planted to sugar beets whether or not a crop was harvested. When the crop was carried through to harvest time but was not harvested for some reason, a value was allowed for feed and fertilizer of the unharvested crop.

In 1963 a study of 1,453 acres producing 26,735 tons of beets on 67 farms in Cache, Box Elder, Weber, Davis, and Utah Counties was made. In addition to the summary shown in table 2, table 3 shows costs and net returns classified by size of enterprise and table 4 the classification is on the basis of yield.

Much is said about the significance of size of operation in all lines of production today. Size of enterprise is generally associated with efficiency in use of the physical inputs of production. Up to a point, large enterprises usually allow for efficiencies that reflect in lower cost per unit. It would be possible to have enterprises that are too large or too small for most economical operation. On diversified farms in Utah, the problem generally seems to be that individual enterprises are too small for the most economical operation. Labor, power and machinery, and overhead inputs generally can be used most effectively with increased size because certain minimums must be had to pay costs

Table 2. Cost and net return per acre from the production of sugar beets, 1945, 1951, 1959, and 1963 studies, Utah

Item	1945	1951	1959	1963
Tons per acre	15.2	15.4	18.2	18.4
Receipts:				
Received from product	\$182.00	\$218.00	\$259.29	\$291.09
Received from by-product*	6.00	6.00	9.43	8.41
Total receipts	\$188.00	\$244.00	\$268.72	\$299.50
Costs:				
Material:				
Manure	\$ 8.60	\$ 7.45	\$ 8.25	\$ 6.39
Commercial fertilizer	2.80	10.63	12.80	20.08
Seed	2.90	2.86	3.19	3.98
Fees	-	-	-	.60
Machinery hired	-	-	-	3.98
Other	3.08	3.46	4.00	5.16
Total	\$ 17.38	\$ 24.40	\$ 28.24	\$ 40.19
Overhead:				
Interest on money in crop	\$ 1.60	\$ 2.40	\$ 4.18	\$ 3.43
Interest on capital investment	13.46	18.51	19.02	31.25
Building upkeep and depreciation	.09	.12	.17	.71
Equipment upkeep and depreciation	2.80	2.50	2.96	13.49
Land taxes	2.52	3.33	4.60	5.92
Water and drainage	2.28	2.82	3.15	4.60
Total	\$ 22.75	\$ 29.68	\$ 34.08	\$ 59.40
Labor:				
Operator and family	\$ 37.48	\$ 39.05	\$ 28.00	\$ 32.93
Hired	34.95	29.44	37.00	37.44
Total	\$ 72.43	\$ 68.49	\$ 65.00	\$ 70.37
Power:				
Horse	\$ 5.98	\$ 3.11	\$ 1.00	-
Tractor	8.97	36.99	50.93	\$ 43.16
Truck	6.36	11.06	14.38	11.65
Total	\$ 21.31	\$ 51.16	\$ 66.31	\$ 54.81
Grand total costs	\$133.87	\$173.73	\$193.63	\$224.77
Net return	\$ 54.13	\$ 50.27	\$ 75.09	\$ 74.73
Operator and family labor return	\$ 91.61	\$ 89.32	\$103.09	\$107.56

*The value of tops is the average of the growers' estimates of their value which as a general rule, are the values the growers can obtain by renting their fields to livestock feeders. Estimates ranged from \$3.00 to \$15.00 per acre and are influenced by the growers' opportunities to use the tops either by renting his field to a cattle feeder or turning his own cattle into the field.

regardless of the total that might be produced. When the minimum level can be exceeded by fuller use of resources, the cost per unit of product will decrease and the net return per unit will increase.

In the 1963 study as the size of the enterprise increased from 10.2 acres to 37.3 acres, costs per acre decreased from \$256.80 to \$214.99, and the cost per ton decreased from \$13.81 to \$12.08 (table 3).

The rate of production or the yield per acre on any given enterprise will depend upon: (a) potential producing ability of the land, (b) weather conditions, and (c) appropriateness of decisions made and actions taken by the farmer. Because condition (a) can be selected and condition (c) is largely within the control of the operator, the resulting financial reward from production is an important and crucial farm management problem. High rates of production are usually associated with financial success from farm enterprises and within the limits of the actual practices of farmers the higher the yield the greater is the net return. As a general rule, that is true because higher rates such as taxes, interest on capital and some of the operations of production result in lower per unit cost because: (a) some fixed costs such as the kind and amount of fertilizer used, the time and method of application of fertilizer and water are constant regardless of the yields produced, and (b) some other costs can be controlled by the operator and his actions can, therefore, influence the yield.

As the yield per acre increased from 14.9 to 23.3 tons, the cost per acre increased from \$214.38 to \$233.53 and the cost per ton decreased from \$16.00 to \$11.12 (table 4).

Net Return

Net return is the difference between

all receipts and all expenses as itemized in the tables. Operator owned inputs such as land, labor, and capital are included as a cost in the production of sugar beets and must be so regarded when considering the relative advantage of producing sugar beets in comparison with any other crop or livestock enterprise on the farm using the same resources. If anyone has the desire, however, of considering a return to operator's labor and/or capital, the figure can be obtained by adding the amount of such figures to the net return. If for example, one was interested in the return to the operator and his family for producing a crop of sugar beets, he could obtain the figure by adding the cost of operator and family labor to the net return as calculated.

Handling of Cost Items

Barnyard manure. The amount of manure that had been applied to the beet land was reported by the operator for the current year as well as for two years previous. The beets were charged 50 percent of the value of the manure applied the current year, 30 percent of the previous year's application, and 20 percent of the application two years previous. The man labor and power cost of the current year's application were all charged against the crop but are included in labor and power costs.

Commercial fertilizers. The sugar beets were charged with all of the current year's application of commercial fertilizers at the actual cost to the farmer. It should be noted that no attempt was made to determine whether the total fertility balance was maintained, decreased, or increased as a result of sugar beet production. Some producers applied little commercial fertilizer in 1963 and some applied none. Some carry-over effect from year to year exists from the application of commercial fertilizer. Such effect has not been deducted from the current year's application

Table 3. Cost and net return per acre from sugar beet production in Utah, 1963, classified by size of enterprise

Item	Less than 15 acres	16-25 acres	26 or more acres
Number of enterprises	29	15	23
Average tons per acre	18.6	19.5	17.8
Average acres per enterprise	10.2	20.0	37.3
Receipts:		<u>per acre</u>	
From beets	\$294.25	\$308.49	\$281.60
From by-products*	7.34	7.11	9.23
Total receipts	\$301.59	\$316.60	\$290.83
Costs:			
Material:			
Manure	\$ 7.93	\$ 7.30	\$ 5.55
Commercial fertilizer	22.06	18.45	19.97
Seeds	3.95	3.54	4.15
Fees	.62	.65	.50
Machinery hired	11.35	8.62	1.24
Other	1.43	.03	8.24
Total	\$ 47.34	\$ 38.59	\$ 39.65
Overhead:			
Interest on money in crop	\$ 3.97	\$ 3.46	\$ 3.22
Interest on capital investment	30.90	30.55	31.70
Building upkeep and depreciation	1.05	.80	.56
Equipment upkeep and depreciation	17.29	9.73	13.50
Land taxes	6.05	5.93	5.88
Water and drainage	5.53	5.64	3.91
Total	\$ 64.79	\$ 56.11	\$ 58.77
Labor:			
Operator and family	\$ 43.03	\$ 35.66	\$ 28.52
Hired	37.38	38.53	37.10
Total	\$ 80.41	\$ 74.19	\$ 65.62
Power:			
Tractor	\$ 51.91	\$ 43.77	\$ 39.93
Truck	12.35	12.77	11.02
Total	\$ 64.26	\$ 56.54	\$ 50.95
Grand total cost	\$256.80	\$225.43	\$214.99
Net return per acre	\$ 44.79	\$ 91.17	\$ 75.84
Cost per ton	\$ 13.81	\$ 11.56	\$ 12.08
Net return per ton	\$ 2.41	\$ 4.68	\$ 4.26

*See footnote, table 2.

nor added from previous year's application. Eighty-one percent of the growers had applied some fertilizer to the land within two years of the 1963 sugar beet crop.

Seed. The cost of seed is the actual cost to the farmer. Some variation among enterprises is a result of the source of the seed supply, the kind or amount applied per acre, and the amount of replanting.

Fees. Fees include the deductions for membership in the Utah Sugar Beet Growers' Association and any appropriate expense for farm labor association membership.

Interest on money in crop. Interest was charged at 5 percent for all money invested in the crop from the time the expense was actually incurred until the farmer was paid for his crop by the processor. This was to compensate for the interest that could have been earned had the same money been invested elsewhere instead of in the beet crop. In the case of investments in labor, both for the operator and his family and for hired labor, the crop year was divided into three periods: labor costs in connection with preparing the land and drilling the seeds were averaged together and interest charged for seven months, those connected with growing operations were charged with four months' interest, and harvesting expenses charged interest at 5 percent for one month.

Interest on capital investment. Interest on investment in land and water, buildings, and machinery charged to the sugar beet enterprise was calculated at 5 percent. Total capital charged to the enterprise was arrived at by adding to the value of the land in beets the value of all specialized beet equipment, a prorated share based on the farmer's estimate of the value of other farm machinery used on the beet enterprise -

except the tractor and truck and equipment attached to the tractor or truck - and a prorated share of the value of the machinery sheds housing equipment used on the beet enterprise.

Building upkeep and repairs. A prorated share of the cost of repairs and normal depreciation of buildings housing machinery used on the sugar beet enterprise constituted this charge.

Equipment depreciation and repairs. The cost of repairs and depreciation to specialized beet machinery was all charged to the enterprise. To this was added a prorated share on the basis of use of the expense and depreciation of other farm machinery used on the sugar beet enterprise, with the exception of the tractor, truck, and their attachments.

Land taxes. Land taxes were calculated on the basis of a ratio of valuation of sugar beet land and equipment to total valuation and checked by assuming sugar beet producing land was class I irrigated land and applying the appropriate mill levy times the assessed value.

Drainage and water taxes were charged against the sugar beet enterprise on the basis of estimated proportion of the total water delivered to the farm applied to the sugar beet crop.

Operator and family labor. Time spent by the operator and his family was estimated by the operator on the basis of the various operations. The time thus spent was charged against the enterprise on the basis of the customary community wage rate either on a piece or hourly wage basis. The operator's time is only that time spent as a laborer. Children's labor was converted to man hours on the basis of a 12-year-old child being worth one-half a man and adding one-eighth for each year to 16 years, at which time the child was

Table 4. Cost and net return per acre from sugar beet production in Utah, 1963, classified on basis of yield

Item	Less than 16	16-20	20 tons or more
		<u>tons per acre</u>	
Number of enterprises	13	19	35
Average tons per acre	13.4	16.6	21.0
Average acres per enterprise	20.8	20.8	43.7
Receipts:		<u>per acre</u>	
From beets	\$211.99	\$262.61	\$348.04
From by-products*	9.06	9.80	7.31
Total receipts	<u>\$221.05</u>	<u>\$272.41</u>	<u>\$355.35</u>
Costs:			
Material:			
Manure	\$ 4.43	\$ 7.12	\$ 6.53
Commercial fertilizer	21.56	20.72	19.21
Seed	3.83	4.45	3.72
Fees	.45	.56	.68
Machinery hired	1.81	4.89	5.70
Other	9.40	6.13	3.23
Total	<u>\$ 41.48</u>	<u>\$ 43.87</u>	<u>\$ 39.07</u>
Overhead:			
Interest on money in crop	\$ 3.30	\$ 3.32	\$ 3.63
Interest on capital investment	30.30	29.45	32.80
Building upkeep and depreciation	.92	.47	.80
Equipment upkeep and depreciation	13.52	11.29	14.91
Land taxes	5.98	5.67	6.07
Water and drainage	5.97	3.77	4.72
Total	<u>\$ 59.99</u>	<u>\$ 53.97</u>	<u>\$ 62.93</u>
Labor:			
Operator and family	\$ 26.43	\$ 31.22	\$ 36.05
Hired	35.98	36.79	38.33
Total	<u>\$ 62.41</u>	<u>\$ 68.01</u>	<u>\$ 74.38</u>
Power:			
Tractor	\$ 39.70	\$ 40.46	\$ 45.98
Truck	10.80	12.80	11.17
Total	<u>\$ 50.50</u>	<u>\$ 53.26</u>	<u>\$ 57.15</u>
Grand total costs	\$214.38	\$219.11	\$233.53
Net return per acre	\$ 6.67	\$ 53.30	\$121.82
Cost per ton	\$ 16.00	\$ 13.20	\$ 11.12
Net return per ton	\$.50	\$ 3.21	\$ 5.80

*See footnote to table 2.

considered equivalent to one man. An item of miscellaneous labor was added on the basis of the farmer's estimate to care for any other labor not included. Operator and family labor averaged 23.8 hours per acre at a cost of \$1.38 per hour.

Operators with ownership interest in the crop estimated their time to be of greater value than that of a hired man with no particular interest in the crop other than that of having a job. In most cases the operator's estimate of the value of his time was no doubt influenced by the opportunity wage he could have obtained elsewhere had he not been employed in the production of sugar beets. Since the question of the proper return to management is so debatable, a conscious effort was made to exclude the wages for management from the labor cost figures in this study. Therefore, a reward to the operator for his time and effort in performing any of the managerial functions has not been included as a cost of production item.

Hired labor costs include the actual payment to man labor whether working by hand or with power equipment. Where a man and equipment were hired, the operator was paid the customary wage for his time spent and the balance attributed to the equipment and power unit. Hired labor averaged 30.8 hours per acre at a cost of \$1.22 per hour.

Horsepower. The basis for determining horsepower costs was the farmer's estimate of the community rate for hired horses. The difference between the com-

munity wage rate for a single man and that of a man and team was considered to be the charge for a team. The number of horse hours was estimated by the farmer according to the operation performed and the rate thus obtained applied to the hours to obtain the horsepower costs. Horsepower actually hired and that furnished by the operator's team were treated in the same manner in arriving at a cost figure in this connection. In 1963 only one farmer reported the use of horses.

Tractor power. When tractors were hired, the actual cost was charged against the enterprise. When tractor work was done on a piece basis, the operator was allowed the customary wage for his time, the power unit was allowed the customary rate for its use, and the balance attributed to the tractor drawn attachments included as machinery hired. Tractors hired and tractors owned and used by the farmer on his beet enterprise were handled in the same manner. An average of 15.2 tractor hours was used at a cost of \$2.84 per hour.

Truck power. Truck power costs were handled in the same manner as the tractor power costs. An average of 16.2 truck hours was used at a cost of \$1.88 per hour.

Risk, general farm overhead. No allowance has been made as a cost item to include over-all risk, the sugar beet enterprise's share of the general farm overhead expense, any change in the status of the farm in general, or the land in particular, for having produced a crop of sugar beets.

