Utah State University

DigitalCommons@USU

Utah Resources Series

Utah Agricultural Experiment Station

1964

Canning Corn Production: Cost and Net Return in Northern Utah 1962

Earnest M. Morrison Utah State University

Guy A. Erikson 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. and Erikson, Guy A., "Canning Corn Production: Cost and Net Return in Northern Utah 1962" (1964). Utah Resources Series. Paper 3.

https://digitalcommons.usu.edu/uas_resources/3

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.



CANNING CORN PRODUCTION

COST AND NET RETURN IN NORTHERN UTAH 1962

AGRICULTURAL EXPERIMENT STATION

By Earnest M. Morrison A. Erikson

9060 02001 9062

CES SERIES 22

UTAH STATE UNIVERSITY - LOGAN - 1964

SUMMARY

- 1. An economic study was made of canning corn production in northern Utah, 1962. Included in the study were 31 enterprises.
- 2. Average size of enterprises was 13.3 acres which varied from 3 to 35 acres. Land values averaged \$432 per acre, and the average equipment value was \$59 per acre.
- 3. Labor requirements for land preparation, growing, and harvesting averaged 4.4, 7.2, and 4.1 hours per acre respectively, resulting in a total labor requirement of 15.7 hours per acre to produce canning corn. Of this, 80.9 percent was furnished by the operator and his family.
- 4. Average cost of production was \$105.30 per acre. On a percentage basis, cost was divided among materials, 16 percent; labor and equipment, 50 percent; taxes and fees, 9 percent; and interest, 25 percent.
- 5. Net return averaged minus \$4.56 per acre. Management and family labor return was \$9.78 per acre.
- 6. In the production of canning corn there was a direct relation between size of enterprise and cost per acre and between yield and net return per acre.
- 7. The most profitable third of the enterprises had an average yield of 5.7 tons of corn per acre and a net return of \$19.69 per acre compared with 4.0 tons and minus \$4.56, respectively, for the average of the study and 2.4 tons and minus \$28.89, respectively, for the least profitable third of the enterprises.

PRODUCING CANNING CORN IN NORTHERN UTAH, 1962

COST AND NET RETURN

Earnest M. Morrison Guy A. Erikson

Sweet corn for canning purposes has been grown commercially in Utah for more than 40 years. For two decades before 1940, the acreage varied between 400 and 800 acres. It increased from 600 acres in 1942 to 6,300 in 1949 and was down to 4,470 acres in 1959. In 1959, the last year for which county data are available, there were five counties in Utah where farmers grew more than 100 acres of canning corn. This accounted for 98 percent of all canning corn reported. Of these, Utah County had 2,468 acres or 55 percent of the total, Cache had 1,059 acres or 23 percent, Box Elder had 483 acres or 11 percent, Davis 217 acres or 5 percent, and Salt Lake had 161 acres or 4 percent.

PURPOSE OF STUDY

In 1949 the first major study of the cost and efficiency of producing canning corn was made in Utah and reported in Bulletin 348 of the Utah Agricultural Experiment Station. Since that time sufficient contact has been kept with growers to calculate a yearly cost of production figure.

A detailed study was made of the 1962 crop in Cache and Box Elder Counties to determine: (1) the physical requirements of producing canning corn, (2) the costs of production in 1962, and (3) the factors associated with successful production.

Authors: Earnest M. Morrison is professor of agricultural economics; Guy A. Erikson is a graduate student in the same department.

SOURCE OF DATA

The data for this study were obtained by the survey method from 31 producers of canning corn in Cache and Box Elder Counties for the 1962 production season. Enumerators, trained for the purpose, interviewed each farm operator who cooperated in the study and obtained detailed information on all costs, returns, methods, and practices used on each canning corn enterprise. Whenever possible returns from corn sold, and cost of seed and commercial fertilizer purchased were taken directly from the farmers' reports from the canning factory. Other data were from records of various types where they existed. Questionnaires were used by the enumerators to guide the interview and to record the information obtained. Excluded from the study were enterprises that seemed not to be typical or representative such as those less than 3 acres which were considered too small to challenge the best efforts and interests of the operator and enterprises such as church farms and Future Farmer projects.

DESCRIPTION OF THE CANNING CORN ENTERPRISE

Canning corn in northern Utah was grown under irrigation on fairly good quality land. Of the 31 enterprises included in the study, size ranged from 3 to 35 acres with an average of 13.3 acres handled as farm family enterprises. Fixed capital invested in the enterprise averaged \$491 per acre of which \$432 was land and \$59 was machinery and equipment.

The growers produced canning corn under contract to a canning company. The contracts made certain guarantees to producers and producers in turn granted certain rights

TA canning corn 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 more than one enterprise existed on one farm either more than one schedule was taken or one schedule was taken for that part that was defined as an enterprise.

to the canning company to supervise the growing and harvesting of the crop. The grower was guaranteed a market for all the produce that met certain specifications. price was agreed to in advance by the farmers through their organization and the canning factory operators. At the time the contract was signed the acreage was specified and the variety of corn best suited to the land and other conditions was selected. Field men hired by processors guided the producers in management and cultural practices. The seedbed was prepared using plows, harrows, and levelers. Seed was planted in rows using corn drills. Processor-owned drills and mechanical harvesters were made available to producers who desired to rent them. Seed was purchased from the processor. Most fertilizer was applied before planting corn, but in some cases it was band drilled at the time of planting and on some farms it was side dressed after the corn had started to grow. rule, weeds were controlled by cultivating and hoeing although, in a few cases, weeds were controlled by spraying. The corn was irrigated to provide sufficient soil moisture for growth. Generally, irrigation water was run in furrows that were made when the corn was cultivated for weed control. On a few enterprises irrigation was by overhead sprinklers. Most of the corn was harvested mechanically by equipment owned by processors and operated by men hired by them.

The ears of corn were harvested and delivered to the factory on order of the fieldmen. A test sample taken from each load was examined for acceptability and a percent tare applied to the load on the basis of the sample examined. There was no attempt made to grade the ear corn other than as acceptable or not acceptable.

By-products of canning corn processing, the unmarketable corn, cobs, and husks, which were delivered with marketable corn, were ensiled. The processors stacked the silage for producers at cost and since it belonged to the producer it was his decision as to what use was made of it. He could feed it to his livestock or sell it to other livestock feeders.

Table 1. Hours of labor required to produce canning corn on 31 farms, northern Utah, 1962

AND THE RESERVE AND ADDRESS OF THE PARTY OF	Labor per acre			Percent	
Item	Family	Hired	Total	of total	
Duanaustian		hov	urs		
Preparation:	1 /	0.1	1.5	9.6	
Manuring	1.4	0.1			
Fertilizing	0.2		0.2	1.3	
Plowing	1.1	ation const	1.1	7.0	
Harrowing	0.7		0.7	4.4	
Leveling	0.3	30 0 000 H 1000 10	0.3	1.9	
Disking	0.3		0.3	1.9	
Digging	0.2	mand - Earl	0.2	1.3	
Ditching	0.1	*	0.1	0.6	
Sub-total	4.3	0.1	4.4	28.0	
Growing:					
Drilling	0.8	*	0.8	5.1	
Cultivating	2.1	*	2.1	13.4	
Spraying	0.1	*	0.1	0.6	
Irrigating	2.8	0.5	3.3	21.0	
Hoeing	0.2	0.3	0.5	3.2	
Miscellaneous			0.3	1.9	
Sub-total	$\frac{0.3}{6.3}$	0.9	7.2	45.9	
Harvesting	2.1	2.0	4.1	26.1	
Grand total	12.7	3.0	15.7	100.0	
Percent of total	80.9	19.1	100.0		

^{*}Less than .1 hour per acre.

In some cases where the canning product was hand picked, the field aftermath was chopped and ensiled. Where the corn was harvested mechanically and the stalks were broken and mashed down, the aftermath was used as livestock feed or plowed under to increase the organic matter in the soil.

LABOR REQUIREMENT

The labor spent in producing canning corn averaged 15.7 hours per acre. Of this, 80.9 percent was furnished by the operator and his family and the remainder hired (table 1).

The labor used was grouped into three time periods: preparation, growing, and harvesting.

Preparation included all tillage and fertilizing operations performed before corn was planted. A total of 4.4 man hours per acre were used in seedbed preparations, of which only .1 hour was hired labor. Three farmers reported hired labor used for seedbed preparation of which two were for hauling manure and two for ditching. The remaining labor, 4.3 hours per acre, was family labor.

Of preparation operations, most time consuming were manuring and plowing using 1.5 and 1.1 hours, respectively. Sixteen percent of the total labor was used for these two operations.

The growing classification included labor used during planting operations and all subsequent operations until harvest. Total labor for growing operations was 7.2 hours per acre.

During growing operations, .9 hour of labor per acre was hired. Ten different operators hired some labor. Hired labor was used on each growing operation at least once. Irrigating and hoeing required .5 hour and .3 hour of hired labor, respectively.

Family labor inputs averaged 6.3 hours per acre. Irrigating and cultivating required 2.8 and 2.1 hours of family labor, respectively.

Harvesting of canning corn must take place at a rapid rate once the corn is ready to maintain the quality of the product. Because of this and because some harvest operations were performed simultaneously, many producers could not itemize labor used for various harvesting and hauling

Table 2. Cost of producing canning corn on 31 farms, northern Utah, 1962

Quantity used per acre 2.7 tons 61 pounds N2 .2 pint 10.8 pounds	acre	of corn 11ars 1.01 1.90 .02	Percent of total percent 4 7 * 5 16
2.7 tons 61 pounds N ₂ .2 pint 10.8 pounds	4.09 7.67 .10 4.66	11ars 1.01 1.90 .02 1.15	percent 4 7 * <u>5</u>
61 pounds N ₂ .2 pint 10.8 pounds	4.09 7.67 .10 4.66	1.01 1.90 .02 1.15	4 7 * <u>5</u>
61 pounds N ₂ .2 pint 10.8 pounds	4.09 7.67 .10 4.66	1.01 1.90 .02 1.15	4 7 * <u>5</u>
.2 pint 10.8 pounds	.10 <u>4.66</u>	.02 1.15	* <u>5</u>
.2 pint 10.8 pounds	.10 <u>4.66</u>	.02 1.15	<u>5</u>
10.8 pounds	Service Control	Line partie	
oda (1 locazo) surreit beschi plani Barbara s	16.52	4.08	16
g bell by lawn a			
12.7 hours	14.34	3.54	14
3.0 hours	3.67	.91	3
	15.00	3.70	14
	12.00	2.96	11
1.98 tons	7.93	1.96	8
	52.94	13.07	50
	5.03	TO CHARLES AND THE SAME OF THE	5
		.16	*
	3.30	.82	3
	.84	.21	1
inotacione del	9.83	2.43	9
The Day of the Park of the Par			
\$491.00 at 5%	24.53	6.06	23
24.66 at 6%	1.48	37	_2
	26.01	6.43	25
Marian da Wales	105.30	26.01	100
	3.0 hours 1.98 tons \$491.00 at 5% 24.66 at 6%	3.0 hours 15.00 12.00 7.93 52.94 5.03 66 3.30 84 9.83 \$491.00 at 5% 24.53 24.66 at 6% 1.48 26.01	3.0 hours 3.67 .91 15.00 3.70 12.00 2.96 7.93 1.96 52.94 13.07 5.03 1.24 .66 .16 3.30 .82 .84 .21 9.83 2.43 \$491.00 at 5% 24.53 6.06 24.66 at 6% 1.48 .37 26.01 6.43

^{*}Less than 1 percent.

operations. Although some producers were able to make such a breakdown of labor used, only one figure has been used and includes all harvesting operations.

On all enterprises except three, harvesting was performed mechanically. On three enterprises, it was by hand labor. Most operators used some hand labor to pick the corn from end rows to keep harvesting equipment from running over marketable corn.

A total of 4.1 hours of labor was employed in the harvest. Of this labor, 2.0 hours were hired and 2.1 hours were family labor.

COST OF PRODUCTION

Cost of production includes all costs, both cash and non-cash, that were incurred on 31 enterprises. These costs were classified as material, labor and equipment, taxes and fees, and interest (table 2).

Considered as material costs were costs of manure, commercial fertilizer, spray, and seed.

To arrive at a cost for manure, average elemental amounts and values of nitrogen, phosphate, and potassium were calculated. The cost of hauling and applying manure to the land was handled separately and was therefore subtracted from the value calculated. The resulting net cost of manure was \$1.50 per ton. Growers reported by years all manure applied in the two previous years to the 1962 cropland. Of the total applied, 50 percent of the value applied in 1962, 30 percent of the previous year's application, and 20 percent of the second previous year's application were charged to the 1962 crop. This resulted in an average application of 2.7 tons per acre at a cost of \$4.09. The cost of applying the manure was all charged to the year of application and was a part of labor costs.

Commercial fertilizer was most costly of all materials used. The cost included cost of nitrogen and phosphate applied. Nitrogen was valued at \$83.75 per ton of 33 percent available nitrogen or 12.7 cents per pound. Phosphate was valued at \$75.50 per ton of 45 percent analysis or 8.4 cents per pound of available P205. In this study, cost of commercial fertilizer application for the 1962 crop constituted the total charge for commercial fertilizer. There was residual value from fertilizer applied in 1962 and in previous years, but no generally accepted measure has yet been developed that could be used to make that adjustment. It was assumed that 100 percent of commercial fertilizer applied in 1962 was used by the 1962 corn crop. Although this procedure may over charge a particular enterprise, there no doubt were some compensating tendencies when all enterprises are added together.

2,4-D was used to control weeds only for severe infestations. Price of 2,4-D was \$3.90 per gallon. This price was determined from information from producers as well as farm supply dealers.

Seed price was obtained from seed dealers and farm operators. Canning corn seed averaged 43 cents per pound.

Materials used in canning corn production cost \$4.08 per ton of corn produced or \$16.52 per acre. Material cost represented 16 percent of the total cost.

Labor and equipment costs include value of family labor, hired labor, operating equipment, and hired machines.

The cost of family labor was determined using the average reported cost of hired labor of \$1.25 per hour. Hired labor cost averaged \$1.22 per hour.

Owner machine cost included depreciation, repairs, fuel, and oil. Depreciation and repairs were 12 percent of the value of equipment used in canning corn production. Fuel and oil cost was 50 cents per hour for equipment operating time. In computing hired machine cost, custom machine rates were applied to physical data that were reported by the producers.

By-products of canning corn production were unmarketable corn, cobs and husks which were made into silage and averaged 1.98 tons per acre. These were stacked on the processor's property by the cannery for a cost of \$4.00 per ton of silage to producers.

Total labor and equipment cost of producing canning corn was \$52.94 per acre or \$13.07 per ton of corn produced. This was 50 percent of total cost. Tax and fees included taxes on land and equipment, water cost, and fees charged by a bargaining association. Taxes were calculated by applying 1962 mill rates for the county where the crop was grown to assessed valuation for first class land. Taxes were applied to assessed valuation of equipment which was assumed to be 20 percent of market value.

Water cost was treated as a tax. Where producers owned water they were charged for upkeep of and improvements made to the distribution system. Interest on the investment was included with land investment. Where water was rented, the whole cost was included in this classification.

Fees charged by the bargaining association were 1 percent of the value of the canned product sold.

Total cost for taxes and fees was \$9.83 per acre or \$2.43 per ton of canning corn produced or 9 percent of total cost.

Interest charges were made against capital invested in corn production. An annual rate of 5 percent was charged against \$491 per acre invested in land and equipment for their use in production. Interest charges also were made at an annual rate of 6 percent on an average amount of \$24.66 of working capital used during the production season adjusted to an annual basis.

Total interest cost was \$26.01 per acre, or \$6.43 per ton of canning corn produced, or 25 percent of total cost.

Total costs averaged \$105.30 per acre or \$26.01 per ton of corn produced.

Table 3. Receipts and returns from 31 canning corn enterprises, northern Utah, 1962

	Receipts per			
Item	Enterprise	Acre	Ton of corn	
Receipts from canning	dollars			
products	1,130.61	85.07	21.00	
Value of by-products	209.13	15.74	3.88	
Total receipts	1,339.74	100.74	24.88	
Total cost	1,393.39	105.30	26.01	
Net return	-53.65	-4.56	-1.13	
Value of family labor	190.58	14.34	3.54	
Net return plus family				
labor return	136.93	9.78	2.41	

RECEIPTS AND NET RETURN

Two sources of receipts were available. Most important of these was sale of canning corn which was valued at \$21.00 per ton. The 31 enterprises had an average yield of 4.05 tons per acre, resulting in receipts of \$85.07. The second source of receipts was from by-products. Factory by-products were valued at \$5.50 per ton and amounted to \$10.87 per acre. Field aftermath was valued at \$4.85 per acre, the average price livestock producers were willing to pay to use the stover. Total value of by-products was \$15.74 per acre or \$3.88 per ton of canning products produced. Receipts were \$1,339.74 per enterprise or \$100.74 per acre. Receipts per ton of corn produced were \$24.88 (table 3).

Average total cost was greater than average gross receipts, resulting in a net return of -\$53.65 per enterprise or -\$4.56 per acre of corn produced. Net return was positive for 13 of the 31 enterprises.

When the cost of family labor was added to net return, the management and labor return was \$136.93 per enterprise or \$9.78 per acre. This figure represents the return to family labor and management used in growing canning corn.

FACTORS ASSOCIATED WITH SUCCESS

Associations between factors of production and financial success of the enterprise were analyzed.

Generally, larger enterprises permit economies in production that result in lower cost per unit of product. In this study the half of the enterprises with the smallest acreages which averaged 6.2 acres, had an average cost per acre of \$123.35 while the half with the largest acreages averaged 19.9 acres with an average cost per acre of \$99.19. Since the yield was 4.8 and 3.8 tons, respectively, the cost efficiencies associated with size did not produce a significant difference in net return per acre or per ton of corn produced.

In agricultural production high yields if economically attained are desirable. These result because many costs are constant regardless of yield and as the yield becomes greater, the cost per unit of product for such items becomes smaller. In this study the half of the enterprises with highest yield per acre averaged 5.9 tons and a net return of \$20.17. The half with lowest yield averaged 2.7 tons per acre and a net return of -\$21.19. While the labor, capital, material, and total cost per acre averaged more for the enterprises with high yields, the greater yields were sufficient to offset the increased costs and produce a greater net return.

Using net return per acre as the measure of over-all profitableness, the most profitable and the least profitable third of the enterprises were determined (table 4). In the most profitable group the net return per acre ranged from \$92.00 to \$7.00, while the least profitable group had a range of minus \$15.00 to minus \$71.00.

The success of the most profitable group seemed to be affected most by better yields of canning corn. This suggested the necessity of obtaining good yields and even though the cost per acre associated with the higher yields obtained by the most profitable group were higher, they were more than offset by the increased returns resulting from the higher yield. The most profitable group had av-

Table 4. Comparison of the most profitable third, least profitable third, and average of all canning corn enterprises, northern Utah, 1962

	Barren en	Average	Average	Service .
		of most	of least	
		profitable	profitable	Average
		third of	third of	of all
		enter-	enter-	enter-
Item	Unit	prises	prises	prises
Receipts per ton	dollars	24.99	24.58	24.88
Cost per ton	dollars	20.55	36.43	26.01
Net return per ton	dollars	3.44	-11.85	-1.13
Receipts per acre	dollars	137.44	59.93	100.74
Cost per acre	dollars	117.75	88.82	105.30
Net return per				
acre	dollars	19.69	-28.89	-4.56
Receipts per en-				
terprise	dollars	1,883.00	1,039.80	1,339.74
Cost per enter-				
prise	dollars	1,613.20	1,541.20	1,393.39
Net return per en-				
terprise	dollars	269.80	-501.40	-53.65
Acres per enter-				
prise	acres	13.7	17.4	13.3
Tons per acre	tons	5.7	2.4	4.0
Capital invested				
per acre	dollars	510.00	460.69	490.00
Hours of labor per				
acre	hours	12.2	10.1	15.7
Material cost per	dollars	17 /7	16 22	16 52
acre	dollars	17.47	16.33	16.53

erage yields 238 percent higher than the least profitable group and averaged higher receipts and higher net return per acre, and lower costs and higher net return per ton.

Since an earlier study was made in 1949 and reported as Utah Agricultural Experiment Station Bulletin 348, some marked changes have occurred in inputs. On a comparable basis the cost per acre has declined about 15 percent. The hours of man labor have been greatly reduced and consequently labor cost and machine costs are down. Capital costs have increased and taxes, water, and seed costs are up. The amount of barnyard manure used has been greatly reduced but is more than offset by an increase in the use of commercial fertilizers.

CONCLUSIONS

While only 4,470 acres were involved in canning corn production in 1959, which was less than the peak year, corn production makes a desirable contribution to the farm program as it furnishes a row crop that adds diversity and provides an opportunity for weed control. To some farmers it supplies an important supplement to the total farm feed supply. It does not compete seriously for the farmer's labor or capital.

Processing of canning corn furnishes the processor with an opportunity to use his plant and facilities more fully. The additional pay roll resulting from the processing benefits the economy of the area.

Whether canning corn production will maintain its present position of importance, improve, or decline depends upon a number of variables. It must compete with other crops that can be grown in the area for the use of the land. It must compete with canning corn production in other areas of western United States. The processed product must compete with other canned, frozen, and fresh products of other areas for a place on the consumers' dinner table.

As a general rule, growing conditions appear to be favorable for canning corn production. Although there is some risk of frost damage, it is not great. The shorter growing season and cooler temperatures decrease the damage which may occur from corn earworms and the cooler temperatures at harvest time apparently contribute to quality of the product.

To compete successfully, production of canning corn must be carried on efficiently to keep per unit cost at a minimum. High yields must be obtained, labor cost must be held down, and good practices and timing of operations must be employed to assure the efficiency of production needed. Producers who accomplished these things in 1962 had a satisfactory financial return.