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COST OF PRODUCTION

Update

For 1979

**BEETS
for PROCESSING
(2nd Year)**

POTATOES - Long Island

SOYBEANS

Darwin P. Snyder

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York 14853

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Introduction

The agricultural industry in New York has long benefited from a continuing research project dealing with specific farm enterprise cost and return data. Commonly known as the New York Farm Cost Account project, this program has provided information for livestock and crop enterprises most prevalent in the State. Some crops, however, are not adequately represented in the records kept by the cooperating farmers to provide enough data to be meaningful to the whole industry. These include various crops grown in sufficient volume to merit specific study to maintain up to date cost of production information.

Data for processing beets were collected in 1979 for the second consecutive year. This publication contains the results for the 1979 costs and returns study as well as a comparison with the 1978 results. Background information on the beet industry in New York as it relates to other important producing states is presented in Cost of Production Update for 1978, A.E. Res. 79-15, D. P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, New York 14853.

Data were also collected for potatoes grown on Long Island. Information was last obtained for this crop in 1976. Since then, concern over the restriction of the use of certain pesticides and the effect on yield and profitability of the crop have resulted in a desire for current economic data. Data for 1979 along with similar information to be obtained in 1980 should provide some measure of the importance of the insecticide Temik to the control of the Colorado potato beetle on Long Island.

With the improvement in soybean prices to growers in recent years, acreage in New York for soybeans has quadrupled in the past ten years. Results of a study of 1979 production costs are summarized in this publication. A full report of the soybean study is presented in The Economics of Soybeans in New York State in 1979, A.E. Res. 80-17, B. L. Anderson and D. P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, New York 14853.

Procedure

Processing beet growers who participated in the 1978 study were given the opportunity to do so again in 1979. Thus, 20 of the 22 growers in the earlier study provided information on their beet enterprise for two consecutive years. The 1979 beet results were developed from the records of those 20 beet enterprises. Carol MacNeil, Cooperative Extension Agent in Ontario County, assisted in gathering data from growers in her area.

The study of Long Island potato producers consisted of records of 10 enterprises, five of which were also included in the last study in 1976. Suffolk County Extension Agent Randy Greider assisted in gathering data for the potato study.

Extension agents in soybean producing areas provided a list of growers from which 18 soybean enterprise records were obtained and included in the study of that crop for 1979.

Cooperating growers provided information about their crop enterprises for the 1979 year during an interview held after the crop was harvested. The questionnaire was designed to determine the grower's cash costs for the crop and to allocate appropriate overhead costs including labor, tractor, equipment, land and other costs related to the producing and disposition of the crop. The approach used relies heavily upon experience with the Cornell Farm Enterprise Cost Account research project for various cost factors not easily determined in an interview situation and for tests of reasonableness used throughout the study.

A detailed explanation of the procedure and forms used to accumulate crop costs and analysing the enterprises is available in three bulletins published by the Department of Agricultural Economics at Cornell.*

* Enterprise Analysis: A guide for determining Field and Vegetable Crop Costs and Returns, A.E. Ext. 76-4, D. P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, N.Y. 14853.

Enterprise Analysis: A guide for determining Fruit Crop Costs and Returns, A.E. Ext. 76-5, D. P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, N.Y. 14853.

Enterprise Analysis: A guide for determining Farm Tractor and Equipment Costs, A.E. Ext. 76-6, D. P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, N.Y. 14853.

The Growing Season in 1979

Weather has a major influence on crop production in New York State. Even though good cultural practices are followed, good yields are highly dependent upon timing and amount of rainfall, temperatures and length of growing season. The following two tables indicate climatic conditions during the 1979 growing season in several areas of the State.

Growing season temperatures in New York were generally somewhat below normal during 1979. The planting season in May was warmer than usual in most areas of the State but the summer and especially the month of September tended to be cooler than normal.

As far as precipitation was concerned, an unusually wet May was followed by a dry June and July in most areas of the State. Normal or above rainfall occurred during August and especially September.

In general, the 1979 growing season tended to be cooler and wetter than normal (Tables 1 and 2).

Table 1. Growing Season Temperature
Selected Stations, New York, 1941-70 and 1979

Station	May		June		July		August		September		Growing Season Total	
	1941-70	1979	1941-70	1979	1941-70	1979	1941-70	1979	1941-70	1979	1941-70	1979
Albany	57.7	60.0	67.5	66.0	72.0	72.5	69.6	69.0	61.9	61.2	65.7	65.7
Alfred	54.6	53.3	63.5	61.0	67.0	65.4	65.2	63.6	58.9	57.6	61.8	61.2
Aurora		56.4		63.3		69.8		66.1		60.5		63.2
Batavia	55.8	57.3	65.9	66.8	69.7	71.8	67.9	67.8	63.9	62.6	64.6	65.1
Binghamton	55.1	55.0	64.8	62.1	69.1	69.0	67.3	65.7	60.2	58.7	63.3	62.1
Canton	54.8	56.4	64.7	62.7	69.2	69.7	67.0	64.3	59.3	57.7	63.0	62.2
Glens Falls		58.5		63.6		71.1		67.1		59.5		64.0
Ithaca	55.2	56.1	65.0	62.5	69.4	68.2	67.5	65.8	60.7	59.1	63.6	62.3
Lowville	54.6	56.8	64.2	64.1	68.3	69.1	66.2	65.6	59.3	58.1	62.5	62.7
Utica		57.8		65.2		71.1		66.5		59.4		64.0

Source: Climatological Data; NOAA, Environmental Data Service, Monthly Reports, New York, 1979, Vol. 91, Nos. 5 to 9.

Table 2. Growing Season Precipitation
Selected Stations, New York, 1941-70 and 1979

Station	May		June		July		August		September		Growing Season Total	
	1941-70	1979	1941-70	1979	1941-70	1979	1941-70	1979	1941-70	1979	1941-70	1979
Albany	3.26	4.13	3.00	1.94	3.12	2.78	2.87	2.67	3.12	4.05	15.4	15.6
Alfred	3.76	3.47	3.76	2.48	3.73	2.72	3.60	3.30	2.93	5.26	17.2	17.2
Aurora	2.98	3.22	2.54	2.51	3.03	2.34	2.81	4.22	2.46	5.24	13.8	17.5
Batavia	3.17	5.05	2.69	2.07	3.05	3.01	3.50	3.99	2.87	6.08	15.3	20.2
Binghamton	3.83	4.26	3.59	0.98	3.83	1.45	3.61	2.44	3.02	5.70	17.9	14.8
Canton	3.37	3.26	2.91	1.50	3.43	1.68	3.47	6.01	3.31	7.19	16.5	19.6
Glens Falls	3.63	5.10	3.77	1.20	3.68	2.97	3.42	3.25	3.31	6.12	17.8	18.6
Ithaca	3.55	2.11	3.40	2.66	3.67	2.18	3.49	4.76	3.08	4.28	17.2	16.0
Lowville	3.42	3.99	2.94	0.97	3.26	1.17	3.58	5.17	3.31	5.77	16.5	17.1
Utica	3.52	3.42	3.55	1.25	4.17	1.31	3.54	3.71	3.32	5.48	18.1	15.2

Source: Climatological Data; NOAA, Environmental Data Service, Monthly Reports, New York, 1979, Vol. 91, Nos. 5 to 9.

PROCESSING BEETS - 1979

Processing beets continue to be an important vegetable crop grown in New York State. New York is second only to Wisconsin in beet production and produces between a quarter and a third of the total U.S. production.

Data gathered from beet growers for the second consecutive year consisted of 20 records in 1979. All 20 of these beet enterprises were included in the 1978 record. The current study will show the results of the 1979 crop costs and returns and will compare the results of the same 20 farms for both years. Results will also be compared for groups of enterprises based on acreage and yield.

Overall Results for the State -

The 20 processing beet enterprises included in the 1979 study had a total of 2,721 acres of beets. This acreage was over 50 percent of the State acreage in beets and, for these 20 growers, represented an increase of 23 percent over their 1978 acres.

These beet enterprises averaged 136 acres in size and had yields averaging 16.5 tons per acre. This yield was about .7 ton higher than the yield for the State as estimated by the Crop Reporting Service. This higher yield was in spite of the fact that more acres of beets were left unharvested in 1979 than in 1978.

In the following tables, costs and returns are shown in detail for these 1979 beet enterprises. Most of the individual cost items to grow the crop increased over the 1978 figures. The major direct costs for fertilizer, seed and chemicals amounted to \$138 per acre or 43 percent of the total growing cost of \$322 per acre. Because of the higher yield in 1979, most of the cost items on a per ton basis decreased compared to 1978. Beets cost nearly \$20 per ton to grow in 1979 to the time of harvest (Table 3).

Table 3. PROCESSING BEETS
Growing Costs
2,721 Acres Planted on 20 Farms
New York, 1979

Item	Rates per Acre	Cost	
		Per Acre	Per Ton
Number of farms		20	
Acres per enterprise		136	
Yield per acre planted, tons*		16.5	
Labor	7.8 hr.	\$ 43	\$ 2.61
Tractor	4.2 hr.	22	1.37
Equipment, large trucks		20	1.26
Custom work, equipment rent		3	.21
Land use		62	3.75
Lime, cover crop, manure		11	.68
Fertilizer: lbs. N-171, P-124, K-151		67	4.04
Seed: 22 lbs.		48	2.93
Chemicals		23	1.40
Interest on operating capital		4	.24
All other		18	1.08
Total growing costs		\$322	\$19.57

* Paid weight

Because only 93 percent of the acreage was harvested in 1979, harvesting and selling costs are analysed in Tables 4 and 5 on a harvested acre basis.

Labor and equipment costs were the major expenses in harvesting the beet crop in 1979. Both labor and tractor costs increased over the 1978 figures because of more difficult harvest conditions and a higher yield. A total of 6.8 hours of labor per acre at a cost of \$42 and equipment costs of \$47 per acre were experienced with the 1979 crop. Table 4 shows that harvesting costs totalled \$123 per acre harvested and \$7 per ton.

Table 4. PROCESSING BEETS
Harvesting Costs*
2,538 Acres Harvested on 20 Farms
New York 1979

Item	Rates per Acre	Cost	
		Per Acre Harvested	Per Ton**
Number of farms		20	
Acres per enterprise		127	
Yield per acre harvested, tons**		17.6	
Labor	6.8 hr.	\$ 42	\$2.40
Tractor	1.7 hr.	12	.65
Truck		7	.37
Equipment		47	2.68
Custom work, equipment rent		4	.25
All other		11	.60
Total harvesting costs		\$123	\$6.95

* Per acre harvested

** Paid weight

Selling costs for beets in 1979 are shown in Table 5. Labor to load piled beets and to haul the beets to the processor required an average of 2.6 hours per acre at a cost of \$15 per acre or nearly \$1 per ton. Some tractor cost was experienced to load beets from piles but most of the \$38 per acre identified as tractor and truck cost was for trucks to haul the crop from the farm to the buyer. In addition to owner operated trucks, these growers averaged \$19 per acre for custom hauling costs. Interest on accounts receivable added another \$13 per acre to the cost of marketing the crop. Overall, the beet crop selling costs amounted to \$88 per acre harvested or \$5 per ton.

Table 5. **PROCESSING BEETS**
Selling Costs*
2,538 Acres Harvested on 20 Farms
New York, 1979

Item	Cost	
	Per Acre Harvested	Per Ton**
Number of farms	20	
Acres per enterprise	127	
Yield per acre harvested, tons**	17.6	
Labor 2.6 hr/ac	\$15	\$.86
Tractor, truck	38	2.14
Equipment	1	.05
Custom Haul	19	1.06
Interest on accounts receivable	13	.71
All other	2	.14
Total selling costs	\$88	\$4.96

* Per acre harvested

** Paid weight

With growing costs of \$322 and harvesting costs of \$114 per acre, production costs for processing beets in 1979 averaged \$436 per acre for these 20 growers on a planted acre basis. Adding to that figure the selling costs of \$82 per planted acre brings the total cost to produce and market beets to \$518 per acre or \$31 per ton (Table 6).

Returns for the 1979 beet crop averaged \$38 per ton. With the average yield of 16.5 tons per acre planted, the total returns amounted to \$629 per acre. These figures are based on cash receipts plus accounts receivable based on estimates of the cooperatives' commercial market value. No attempt was made to include an estimate of cooperatives' retained earnings.

All growers but four made profits on their beet enterprises in 1979. As a group, these 20 growers had profits averaging \$111 per acre and \$7 per ton as shown in Table 6. They received an average return of \$1.21 for each dollar of cost spent on their crop.

Table 6. **PROCESSING BEETS**
Costs and Returns*
2,721 Acres Planted on 20 Farms
New York, 1979

Item	Cost or Return	
	Per Acre Planted	Per Ton**
Number of farms	20	
Acres per enterprise	136	
Yield per acre planted, tons**	16.5	
Costs to:		
Grow	\$322	\$19
Harvest	<u>114</u>	<u>7</u>
Produce	\$436	\$26
Sell	<u>82</u>	<u>5</u>
Total costs	\$518	\$31
Returns	\$629	\$38
Profit	\$111	\$ 7
Return per dollar of cost	\$1.21	

* Per acre planted

** Paid weight

Comparison of Two Years' Data -

With data for two years on 20 of the same farms it is possible to compare the results of the beet enterprise for consecutive years under the same management.

Table 7 compares several factors for these farms for 1978 and 1979. These growers increased their beet acreage by 23 percent as the average size increased from 111 acres in 1978 to 136 acres in 1979. With a somewhat higher yield in 1979, marketing problems and weather problems resulted in the harvest of only 93 percent of the acres planted.

Higher costs per acre can be attributed to inflationary pressures although this trend was tempered by the increased acreage. Costs per ton remained essentially the same for both years because of the effect of the higher yield. Returns per ton averaged \$3 less in 1979. In spite of the higher yield, the lower price and the higher costs combined to result in a lower profit per acre and per ton in 1979.

Table 7. PROCESSING BEETS
Costs and Returns
1978 and 1979 Compared
Same 20 Farms, New York State

Item	Study Results For:	
	1978	1979
Number of farms	20	20
Acres per enterprise	111	136
Yield per acre planted, tons*	15.7	16.5
Percent of acres harvested	100%	93.3%
Costs per acre planted:		
Growing	\$307	\$322
Harvesting	<u>103</u>	<u>114</u>
Production	\$410	\$436
Selling	<u>62</u>	<u>82</u>
Total costs per acre	\$472	\$518
Returns per acre	\$644	\$629
Profit per acre	\$172	\$111
Costs per ton:		
Growing	\$ 19	\$ 19
Harvesting	<u>7</u>	<u>7</u>
Production	\$ 26	\$ 26
Selling	<u>4</u>	<u>5</u>
Total costs per ton	\$ 30	\$ 31
Returns per ton	\$ 41	\$ 38
Profit per ton	\$ 11	\$ 7
Return per dollar of cost	\$1.37	\$1.21
Other factors per acre:		
Land cost	\$ 56	\$ 62
Fertilizer cost	\$ 66	\$ 67
Lb per acre: N	168	171
P	135	124
K	160	151
Seed cost	\$ 50	\$ 48
Lb per acre	22	22
Chemical cost	\$ 22	\$ 23
Harvest equipment cost	\$ 46	\$ 47

* Paid weight.

Results Based on Size of Enterprise -

The 1979 group of 20 beet enterprises was divided into two groups of ten each. The group having the smaller enterprises averaged 52 acres each and ranged from 27 to 96 acres per enterprise. The group of larger enterprises averaged 220 acres each and ranged from 105 to 394 acres per enterprise.

A comparison of the two groups had similar results to the 1978 growers when sorted by size of enterprise. Smaller enterprises tended to have somewhat lower yields and growing costs per acre. Because of greater use of custom harvesting, smaller enterprises had higher harvesting costs per acre. Larger enterprises tended to hire more custom hauling and with generally greater distances to the processors they had higher selling costs. Total costs per acre for both groups was essentially the same.

The small enterprises had an average return of \$40 per ton - \$2 per ton higher than the average for the large enterprises. Thus, in spite of a slightly lower yield and with similar total costs per acre, the smaller enterprises showed a higher profit per acre. They averaged \$134 per acre profit compared to \$105 per acre for the large enterprise group.

Table 8. PROCESSING BEETS
Costs and Returns
by Size of Enterprise
20 Farms, New York, 1980

Item	27 to 96 acres	105 to 394 acres	All Farms
Number of farms	10	10	20
Acres per enterprise	52	220	136
Yield per acre, tons*	16.3	16.5	16.5
-- Per Acre --			
Costs to:			
Grow	\$310	\$325	\$322
Harvest	142	108	114
Produce	\$452	\$433	\$436
Sell	61	86	82
Total Costs	\$513	\$519	\$518
Returns	\$647	\$624	\$620
Profit	\$134	\$105	\$111
Return per dollar of cost	\$1.26	\$1.20	\$1.21
Total cost per ton	\$31	\$32	\$31
Returns per ton	\$40	\$38	\$38
Profit per ton	\$ 9	\$ 6	\$ 7
Profit per enterprise	\$6,987	\$23,184	\$15,086

* Paid Weight

As with most endeavors, scale of operation parallels the risk involved and the quality of management necessary for success. Large enterprises involve more risk and better management than do small enterprises. In both groups of beet growers based on size, two out of ten enterprises showed a loss in 1979. On the average, however, the larger beet enterprises, with four times the acreage, had total profits over three times the size of the smaller enterprises.

Results Based on Yield -

The variation in yield among beet enterprises was not as great in 1979 as it was in 1978. When the group was divided into two groups of ten each based on yield, the lower yielding group ranged from 13.0 to 16.0 tons per acre and averaged 14.2 tons per acre. The higher yielding group had yields ranging from 16.1 to 28.3 tons per acre with only one enterprise yielding over 21 tons. This group had an average yield of 17.8 tons per acre.

As shown in Table 9, production costs, which include growing and harvesting costs, were not significantly different between the two yield level groups. Selling costs which are largely hauling costs did vary significantly between the two groups. The selling costs for the high yield group were \$36 per acre or about 60 percent higher than the low yield group. The 25 percent higher yield and greater hauling distance for the larger enterprises will generally account for the higher selling cost per acre for the high yield group.

An added bonus, however unrelated to yield, to the high yield group was a return that averaged \$2 per ton higher than that received by the low yield group. Thus, somewhat higher total costs per acre were more than offset by the effect of a better price for more beets with the result of higher profits for the high yield group.

Table 9. PROCESSING BEETS
Costs and Returns
Based on Yield
20 Farms, New York, 1980

Item	Yield Per Acre		
	13.0 to 16.0 tons	16.1 to 28.3 tons	All Farms
Number of farms	10	10	20
Acres per enterprise	102	170	136
Yield per acre, tons*	14.2	17.8	16.5
-- Per Acre --			
Costs to:			
Grow	\$319	\$324	\$322
Harvest	<u>122</u>	<u>110</u>	<u>114</u>
Produce	\$441	\$434	\$436
Sell	<u>59</u>	<u>95</u>	<u>82</u>
Total Costs	\$500	\$529	\$518
Returns	\$532	\$686	\$629
Profit	\$ 32	\$157	\$111
Return per dollar of cost	\$1.06	\$1.30	\$1.21
Total cost per ton	\$35	\$30	\$31
Returns per ton	\$37	\$39	\$38
Profit per ton	\$ 2	\$ 9	\$ 7
Profit per enterprise	\$3,294	\$26,877	\$15,086

* Paid Weight

The following three tables contain the summary and analysis of all 20 beet enterprises in the Study for 1979. Table 12 provides a listing of selected factors for each enterprise to illustrate ranges and variations between enterprises.

Table 10.

RUN DATE 05 01 80
FISCAL YEAR 1979

NEW YORK FARM COST ACCOUNTS
SUMMARY AND ANALYSIS OF CROP ENTERPRISE 4060 TABLE BEETS

(20)
FDR ALL FARMS
27 to 394 Acres

D E B I T S

C R E D I T S

F A C T O R S

GROWING_COSTS--OPER_1:	QTY	UNIT	TOTAL COST/ACRE \$	QTY	UNIT	TOTAL \$
1. LABOR	21,299	HR	116,884	43		
2. TRACTOR	11,526	HR	61,141	22		
3. TRUCK			3,537	1		
4. EQUIPMENT			53,002	19		
5. CUSTOM WORK, EQUIP RENT			9,277	3		
6. LAND USE			167,767	62		
7. MANURE, COVER CROPS			27,175	10		
8. LIME			3,269	1		
9. FERTILIZER-N*465,321 LB						
10. P*337,873 LB						
11. K*411,204 LB			180,973	67		
12. SEED, PLANTS	59,616	LB	131,175	48		
13. SPRAY, DUST MATERIALS			62,674	23		
14. INTEREST			10,871	4		
15. ALL OTHER			48,262	18		

HARVESTING_COSTS--OPER_2:	QTY	UNIT	TOTAL COST/ACRE \$	QTY	UNIT	TOTAL \$
16. LABOR	17,249	HR	107,185	39		
17. TRACTOR	4,431	HR	29,318	11		
18. TRUCK			16,737	6		
19. EQUIPMENT			120,161	44		
20. CUSTOM WORK, EQUIP RENT			11,042	4		
21. ALL OTHER			26,672	10		

STORING_&SELLING_COSTS--OPER_3:	QTY	UNIT	TOTAL COST/ACRE \$	QTY	UNIT	TOTAL \$
22. LABOR	6,648	HR	38,411	14		
23. TRACTOR, TRUCK			95,633	35		
24. EQUIPMENT			2,364	1		
25. BUILDING USE			0	0		
26. INTEREST			31,813	12		
27. ALL OTHER (incl head- 4769)			53,907	20		

TOTAL COSTS	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
28. TOTAL COSTS			\$1,409,250			
29. GAIN			301,713			

TOTAL DEBITS	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
30. TOTAL DEBITS			\$1,710,963			

* DETERMINED BY COST ACCOUNT STAFF

** VALUE OF BY-PRODUCT DEDUCTED

ACRES *	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
31. CROP	44,762	TN	1,710,963			
32. BY-PRODUCT			0			
33. OTHER RETURNS			0			
34. TOTAL RETURNS			\$1,710,963			
35. LOSS			0			
36. TOTAL CREDITS			\$1,710,963			

ACRES *	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
A. ACRES *						
B. TOT GROW COST (SUM 1 THRU 15)			\$ 876,007			
C. TOT HARV COST (SUM 16 THRU 21)			\$ 311,115			
D. PRODUCTION COST (B+C)			\$ 1,187,122			
E. TOT S & S COST (SUM 22 THRU 27)			\$ 222,128			
F. NET** CROP COST (28-32)			\$ 1,409,250			
G. TOT LABOR HOURS (1+16+22)			45,196	HP		
H. TOT LABOR COST (1+16+22)			\$ 262,480			
I. LABOR RETURNS (H+29-35)			\$ 564,193			

YIELD	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
J. YIELD						
K. FERTILIZER - N		(31/A)				
L.		(9/A)	16.5	TN		17.6
M.		(10/A)	171	LB		
N.		(11/A)	124	LB		
O.		(12/A)	151	LB		
P.		(12/A)	22	LB		
Q.		(8/A)	322			
R.		(C/A)	\$			
S.		(C/A)	\$			
T.		(O+P)	\$			
U.		(28/A)	\$			
V.		(34/A)	\$			
W.		(S-P)	\$			
X.		(1/A)	\$			
Y.		(16/A)	\$			
Z.		(U+V)	\$			

LABOR RETURNS	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
AA. GROWING COST		(8/31)	\$			
BB. HARVESTING COST		(C/31)	\$			
CC. NET** PRODUCTION COST (D-32)/31			\$			
DD. STORE & SELL COST (E/31)			\$			
EE. TOTAL COSTS (28/31)			\$			
FF. NET COST ** (F/31)			\$			
GG. TOTAL RETURNS		(34/31)	\$			
HH. NET RETURNS ** (34-32)/31			\$			
II. PROFIT (HH-FF)			\$			

LABOR RETURNS	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
JJ. PROD / HR OF LABOR (31/(1+16))						1.2
KK. RETURN PER HR OF LABOR (1/G)						\$ 12.48
LL. RETURN PER \$ OF COST (34/28)						\$ 1.21

LABOR RETURNS	QTY	UNIT	TOTAL \$	QTY	UNIT	TOTAL \$
AA. GROWING COST		(8/31)	\$			
BB. HARVESTING COST		(C/31)	\$			
CC. NET** PRODUCTION COST (D-32)/31			\$			
DD. STORE & SELL COST (E/31)			\$			
EE. TOTAL COSTS (28/31)			\$			
FF. NET COST ** (F/31)			\$			
GG. TOTAL RETURNS		(34/31)	\$			
HH. NET RETURNS ** (34-32)/31			\$			
II. PROFIT (HH-FF)			\$			

* DETERMINED BY COST ACCOUNT STAFF

** VALUE OF BY-PRODUCT DEDUCTED

RETURNS

Table 11.

TABLE BEETS
 COSTS AND RETURNS PER ACRE
 2,721 ACRES ON 20 COST ACCOUNT FARMS, 1979

ITEM	AVERAGE PER ACRE
COSIS: GROWING:	
LABOR 8 HR	\$ 43
TRACTOR 4 HR	22
TRUCK, EQUIPMENT	21
CUSTOM WORK, EQUIP RENT	3
LAND USE	62
MANURE, LIME, COVER CROP	11
FERT - LBS N- 171, P- 124, K- 151	67
SEED, PLANTS 22 LB	48
SPRAY, DUST MATERIALS	23
INTEREST, ALL OTHER	22
TOTAL GROWING COSTS	\$ 322
HARVESTING:	
LABOR 6 HR	39
TRACTOR 2 HR	11
TRUCK, EQUIPMENT	50
CUSTOM WORK, EQUIP RENT	4
ALL OTHER	10
TOTAL HARVESTING COSTS	114
TOTAL PRODUCTION COSTS	\$ 436
STORING AND SELLING:	
LABOR 2 HR	14
TRACTOR, TRUCK, EQUIP	36
BUILDING USE	0
INTEREST, ALL OTHER	32
TOTAL STORING AND SELLING COSTS	82
TOTAL COSTS	\$ 518
RETURNS:	
CROP - YIELD: 16.5 TN	\$ 629
BY-PRODUCT, OTHER RETURNS **	0
TOTAL RETURNS	\$ 629
PROFIT:	\$ 111
AVERAGE	
OTHER FACTORS: COST PER TN TO: GROW	\$ 20
HARVEST	7
STORE AND SELL	5
TOTAL (OR NET*) COST PER TN	31
TOTAL (OR NET*) RETURN ** PER TN	38
PROFIT PER TN	7
LABOR RETURN PER ACRE	\$ 207
PRODUCTION PER HOUR OF LABOR	1.2 TN
RETURN PER HOUR OF LABOR	\$ 12.48
RETURN PER DOLLAR OF COST	1.21

* VALUE OF BY-PRODUCTS, IF ANY, DEDUCTED
 ** RECEIPTS FROM GOVERNMENT PROGRAMS NOT INCLUDED

Table 12.

PROCESSING BEETS
Selected Factors
2,721 Acres on 20 Farms
New York, 1979

Farm No.	Yield per acre tons	Average Per Acre Planted			Average Per Ton*		Return per \$ of cost \$
		Grow Cost \$	Harvest Cost \$	Profit \$	Costs \$	Returns \$	
413	20.8	329	101	207	27	37	1.37
414	16.3	291	84	127	31	39	1.26
418	16.2	342	122	106	33	39	1.20
407	15.1	331	110	58	34	38	1.12
404	13.3	349	80	11	35	36	1.02
417	17.3	378	82	161	31	40	1.30
408	16.6	333	176	-4	35	35	0.99
416	13.9	331	156	-36	42	39	0.94
405	16.1	252	83	258	25	41	1.63
409	13.0	294	122	0	35	35	1.00
412	16.0	327	164	20	36	37	1.04
419	16.3	347	162	102	35	41	1.18
406	15.2	300	101	185	29	42	1.42
420	13.8	259	168	-48	37	33	0.91
402	13.3	241	115	114	30	39	1.28
403	17.6	337	110	249	29	43	1.49
415	28.3	336	147	623	19	41	2.18
411	13.6	281	105	161	32	44	1.37
410	13.9	333	178	-14	39	38	0.98
401	20.1	323	120	303	26	41	1.59
Range	13.0 to 28.3	241 to 378	80 to 178	-48 to 623	19 to 42	33 to 44	0.91 to 2.18

* Paid Weight

LONG ISLAND POTATOES - 1979

New York State ranked tenth in potato production in the United States in 1979. Production in the State has been fairly constant at 12 to 13 million hundredweight annually over the past decade. Roughly half of that production has been grown on Long Island. In 1979, Long Island growers produced 6.4 million hundredweights of potatoes on nearly 22,000 acres with an average yield of 295 hundredweights per acre according to the U.S.D.A. Crop Reporting Board.

Cost of production information for Long Island potatoes was last obtained in 1976*. Because of concern over the economic effects of the pending withdrawal of the insecticide Temik from use on Long Island, a study of the current production costs for potatoes was undertaken. Thus, production costs were obtained for the 1979 crop year from a group of ten cooperating growers. Each grower used Temik as a major defense against the Colorado potato beetle.

In the following presentation the current production costs for 1979 will be discussed and compared with those for 1976.

The 1979 Study Results -

The group of ten growers had potato enterprises ranging in size from 53 to 320 acres and averaging 159 acres per enterprise. Yields in 1979 for these growers averaged 287 hundredweights per acre - a fairly reasonable yield for the past five years.

Growing costs for potatoes on these farms averaged \$829 per acre in 1979 as shown in Table 13. The major costs were cash costs for fertilizer, seed and chemicals. Together, these costs totalled \$490 per acre and accounted for over two-thirds of all costs excluding land. Labor costs of \$58 per acre include the cost of the operator's labor and management as well as hired labor.

* Cost of Production Update for 1976; A.E. Res. 77-11, D. P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, New York 14853.

Table 13.

LONG ISLAND POTATOES
 Growing Costs
 1,594 acres on 10 Farms
 New York, 1979

Item	Rates per Acre	Cost	
		Per Acre	Per Cwt.
Number of farms			10
Acres per enterprise			159
Yield per acre, cwt.			287
Labor	12 hrs.	\$ 58	\$.20
Tractor	4 hrs.	20	.07
Truck		2	.01
Equipment		60	.21
Custom work, equipment rent		18	.06
Land use		117	.41
Cover crop, lime		21	.07
Fertilizer: Lbs. N-192, P-346, K-173		154	.54
Seed 2,150 lbs.		153	.53
Chemicals		183	.64
Interest on operating capital		12	.04
All other		31	.11
Total growing costs		\$829	\$2.89

The land cost of \$117 per acre represents an average of owned and rented land costs. Values for agricultural use, which excludes development rights, varied from \$1,000 to \$2,300 per acre. The costs for rented land were well below ownership costs. However, potatoes are grown on owned and rented land on Long Island and the land use cost as shown represents the average cost for these growers in 1979.

Harvesting costs include vine killing, the harvest operation and the costs to place the potatoes in farm storage. No grading, storage or marketing costs are included. Labor and mechanical harvesting equipment were the major harvesting costs. These two items accounted for 70 percent of the total harvesting costs. Costs for 1979 to harvest the crop totalled \$118 per acre or \$.41 per hundredweight (Table 14).

Table 14.

LONG ISLAND POTATOES
Harvesting Costs
1,594 acres on 10 Farms
New York, 1979

Item	Rates per Acre	Cost	
		Per Acre	Per Cwt.
Labor	8 hrs.	\$ 41	\$.15
Tractor	2 hrs.	9	.03
Truck		7	.02
Equipment		42	.15
Custom work, equipment rent		0	0
All other		<u>19</u>	<u>.06</u>
Total harvesting costs		\$118	\$.41

Total production costs for 1979 amounted to \$947 per acre or \$3.30 per hundredweight. An average value of \$3.50 per hundredweight was used as a reasonable value of the crop at the time of harvest. Using that return with the average yield of 287 hundredweights per acre provided these growers with an average return of \$1,003 per acre and a profit of \$56 per acre or \$.20 per hundredweight. The result was a return of \$1.06 for each dollar spent on the crop (Table 15).

Table 15. LONG ISLAND POTATOES
Production Costs and Returns
1,594 acres on 10 Farms
New York, 1979

Item	Cost or Return	
	Per Acre	Per Cwt.
Number of farms		10
Acres per enterprise		159
Yield per acre, cwt.		287
Costs to:		
Grow	\$ 829	\$2.89
Harvest*	118	.41
Produce	\$ 947	\$3.30
Returns**	\$1003	\$3.50
Profit	\$ 56	\$.20
Return per dollar of cost		\$1.06

* Excludes grading, storing and selling costs.

** A return of \$3.50 per cwt. at harvest was assumed for all growers.

Table 16 shows several factors for the ten growers involved in the study for 1979. It indicates the range in size of enterprise, yield and cost per acre and per ton that existed from farm to farm.

Table 16. LONG ISLAND POTATOES
Selected Factors
10 Enterprises, New York, 1979
(Ranked by size of enterprise)

Farm No.	Acres per farm	Yield per acre cwt.	Production per hour of farm labor cwt.	Average per Acre		Production cost per Cwt. \$
				Grow Cost \$	Harvest Cost \$	
10	320	340	21	896	113	2.97
3	235	286	11	851	143	3.48
5	200	290	27	828	100	3.19
7	160	255	13	735	97	3.26
8	160	257	12	744	128	3.39
1	136	315	25	749	147	2.85
6	130	228	9	879	114	4.35
9	110	255	12	740	117	3.35
2	90	283	12	926	73	3.52
4	53	281	7	988	168	4.11
All farms	159	287	14	829	118	3.30

Comparison of Two Year's Data -

Data for the 1976 and 1979 studies are compared in two ways in Table 17. First, production costs are noted for the whole group included in the study for each year. Next, a comparison of data is made for five enterprises on farms that were in the study for each of the two years.

Table 17. LONG ISLAND POTATOES
Production Costs
1976* and 1979 Compared
New York State

Item	Cost			
	Per Acre		Per Cwt.	
	1976	1979	1976	1979
Number of farms	8	10		
Acres per enterprise	123	159		
Yield per acre, cwt.	307	287		
Costs to: Grow	\$733	\$829	\$2.39	\$2.89
Harvest	<u>113</u>	<u>118</u>	<u>.37</u>	<u>.41</u>
Produce	\$846	\$947	\$2.76	\$3.30
Same farms	5	5		
Acres per enterprise	145	144		
Yield per acre, cwt.	309	267		
Costs to: Grow	\$742	\$795	\$2.40	\$2.97
Harvest	<u>111</u>	<u>127</u>	<u>.36</u>	<u>.47</u>
Produce	\$853	\$922	\$2.76	\$3.44

* 1976 land costs were adjusted to be comparable to the 1979 land costs.

Both growing and harvesting costs increased for both groups between 1976 and 1979. While this would be expected in these inflationary times, the increase is not likely as great as one might expect. A significant increase (30 to 40 percent) did occur in the cost of chemicals per acre. However, growers have fought increasing costs by becoming more effective in their use of labor and equipment. In addition, they may not have reinvested in equipment as readily as they, perhaps, should to maintain the viability of their operation in the long run. Thus, actual costs per acre have not risen as much as they would have if production practices in 1979 were the same as they were in 1976.

Table 17 shows a greater percentage increase in costs on a hundredweight basis than on an acre basis. That difference illustrates the effect of the lower yield experienced by these growers in 1979 compared to 1976. Yield is critical to profit. Rising costs with static yields put growers in an increasingly tight economic squeeze without offsetting price adjustments.

SOYBEANS - 1979*

Production Trends -

United States production of soybeans has experienced phenomenal growth. In the 1920s and 1930s soybeans planted were used for hay or plowed under as a cover crop. In 1925 only 415 thousand acres were harvested for beans, and total production amounted to less than 5.0 million bushels.

Today, the United States is the leading producer of soybeans. Total production in 1979 was estimated to be 2,267.6 million bushels. In that year the number of acres devoted to soybeans approached the number of acres of grain corn for the first time. Soybean acreage was estimated at 70.5 million acres compared to 71.0 million acres of corn for grain.

Although soybean acreage has expanded almost every year since 1940, unprecedented increases have occurred in the last few years. Between 1960 and 1979 soybean acreage increased almost three-fold, while production increased four-fold. Average yield increased 30 percent during that period, but the major portion of this expansion has occurred since 1976. Between 1976 and 1979 acreage soared from 49.4 to 70.5 million acres, while total production increased from 1,287.6 to 2,267.6 million bushels.

Soybeans were a relatively unimportant crop in New York for many years. Throughout the 1960s acres harvested ranged between 3,000 and 6,000 acres. During that time yields varied between 16 and 23 bushels per acre.

Recent interest in alternative field crops by New York farmers has resulted in a doubling of soybean acreage over the past five years (Table 18). Thus, New York soybean acreage has increased from about 11,000 acres in 1975 to about 23,000 acres in 1979 according to the New York Crop Reporting Service. This acreage and its production amount to only three hundredths of one percent of the total United States soybean crop. Even so, there is interest enough among growers to explore the feasibility of establishing a soybean processing plant in central New York.

* Adapted from The Economics of Soybeans in New York in 1979, A.E. Res. 80-17, B. L. Anderson and D. P. Snyder, Department of Agricultural Economics, Cornell University, Ithaca, New York 14853.

Table 18. SOYBEAN ACREAGE, YIELD AND PRODUCTION
New York State, 1960-1979

Year	Acres Harvested (1,000 Ac.)	Yield (Bu./Ac.)	Production (1,000 Bu.)
1960-64 averages	4	17.8	68
1965-69 averages	4	20.2	87
1970	6	20.0	120
1971	7	22.0	154
1972	8	21.0	168
1973	11	23.0	253
1974	13	26.0	338
1975	11	27.0	297
1976	12	26.0	312
1977	19	23.0	437
1978	22	23.0	506
1979	23	26.0	598
1979 U.S. Average	70,530	32.2	2,267,647

Source: Crop Production; 1979 Annual Summary, Crop Reporting Board, ESCS,
USDA, Washington, D.C. 20250

Location of Production -

United States soybean production is concentrated in the Midwest and Southeast. Soybeans compete with corn for land throughout the Corn Belt. In Arkansas, soybeans have taken over much of the land once used for cotton. In the other Southeastern states, most of the increased soybean acreage is land recently brought into crop production.

New York ranked 30th in soybean production in 1979 (Table 19). The State's total production is insignificant compared to states in the Corn Belt and the Southeast. Production in New York is concentrated in the Central Plains area of the State between Syracuse and Buffalo.

Table 19.

SOYBEAN PRODUCTION
Leading States and New York
1960, 1970, 1975 and 1979

State	Rank in 1979	Production, Million Bushels			
		1960	1970	1975	1979
Illinois	1	129	211	299	374
Iowa	2	66	185	237	310
Missouri	3	50	88	114	187
Minnesota	4	41	79	99	167
Indiana	5	65	102	121	159
Ohio	6	37	73	103	145
Arkansas	7	51	99	117	144
New York	30	0.1	0.1	0.3	0.6

Source: Fats and Oils Situation, ESCS, USDA, Washington, D.C. 20250
1979 Data - Crop Production 1979 Annual Summary, ESCS, USDA,
Washington, D.C. 20250

Soybean Yields -

The average United States yield per acre of soybeans increased from 23.5 in 1960 to approximately 32 bushels per acre in 1979. Ten states had an average yield of 32 bushels per acre or more (Table 20). States with the highest yields are located in the Midwest. However, one Eastern state (Pennsylvania) had an average yield equal to the national average. In 1979, New York ranked 25th among producing states in yield. The state has not experienced the dramatic and stable increase in bushels per acre that some other states have.

Table 20.

SOYBEAN YIELDS
Leading States and New York
1960, 1970, 1975 and 1979

State	Rank in 1979	Average Yields, Bushels Per Acre			
		1960	1970	1975	1979
Illinois	1	26.0	31.0	36.0	38.5
Iowa	2	25.5	32.5	34.0	38.0
Indiana	3	27.0	31.0	33.5	36.0
Ohio	3	24.5	28.5	33.0	36.0
Nebraska	5	28.0	22.0	27.0	34.0
Wisconsin	5	17.0	24.0	25.5	34.0
South Dakota	7	17.0	17.5	25.0	33.0
Kentucky	8	22.0	27.0	27.0	32.5
Minnesota	9	19.5	26.0	27.0	32.0
Pennsylvania	9	23.0	32.0	28.0	32.0
New York	25	17.0	20.0	27.0	26.0
United States					32.2

Source: Fats and Oils Situation, ESCS, USDA, Washington, D.C. 20250
1979 Data - Crop Production 1979 Annual Summary, ESCS, USDA,
 Washington, D.C. 20250

Soybean Prices -

Between 1960 and 1970 prices received by farmers for soybeans ranged between \$2.13 and \$2.85 per bushel (Table 21). Prices experienced significant increases in 1972, 1973 and 1974. These increases were due to unusually high foreign demand.

Table 21. SOYBEAN PRICES RECEIVED BY FARMERS
U.S. and New York, 1960-1979

Year	Prices Per Bushel	
	United States	New York
1960	\$2.13	
1961	2.28	
1962	2.34	
1963	2.51	
1964	2.62	
1965	2.59	
1966	2.75	
1967	2.49	
1968	2.43	
1969	2.35	\$2.10
1970	2.85	2.65
1971	3.03	2.65
1972	4.37	3.50
1973	5.68	5.20
1974	6.64	7.00
1975	4.92	4.25
1976	6.81	6.50
1977	5.79	5.68
1978	6.56	6.25
1979	6.19	5.80

Source: Fats and Oils Situation, ESCS, USDA, Washington, D.C. 20250
1979 Data - Agricultural Prices, Annual Summary, 1979, ESCS, USDA, Washington, D.C. 20250

Soybean prices dropped sharply to \$4.92 per bushel in 1975, but rebounded the following year to \$6.81. The average price in 1979 was \$5.80 per bushel.

Prices received by farmers in New York State were generally lower, but followed the United States trend. In 1979, New York Farmers received \$5.80 per bushel.

Production Costs for Soybeans in New York State

Data collected from the 18 growers included growing and harvesting costs to the point where the crop was placed in farm storage or on a truck to be hauled off the farm. No storage or hauling costs were estimated because of wide variations in marketing practices. An average return of \$6.00 per bushel was used to represent a value for the soybeans on the farm at the time of the 1979 harvest. The same return per bushel was used for all soybean enterprises so that the estimated profits are the result of size of enterprise, yield and production cost variations.

All 18 soybean enterprises are averaged together to produce the basic growing and harvesting costs per acre. Acreage for these 18 growers ranged from about 50 to 500 acres each. To study the effect of size of enterprise, average costs for growers with 50 to 150 acres per enterprise are compared with larger enterprises ranging from 200 to 500 acres.

Finally, the group of 18 growers are divided into three groups based on yield per acre. This produced groups with yields ranging from 19 to 27, 28 to 31 and 31 to 45 bushels per acre. Yields for the three groups averaged 23, 30 and 38 bushels per acre, respectively.

Overall Results for the State -

All of the soybean producers included in this study except four were located in Seneca County. One grower from Yates County provided information and the remaining three records came from growers in Livingston County.

The growing and harvesting costs for the 18 soybean enterprises included in the study are summarized in Table 22. These enterprises ranged in size from 53 to 480 acres and averaged 193 acres per enterprise. Yields for this group of growers averaged 30 bushels per acre. The New York Crop Reporting Service estimated a State average yield of 26 bushels per acre for 1979.

The largest single cost to grow soybeans in New York is the cost of land. With real estate taxes averaging about \$10 per acre of open cropland, the major cost component of owned land is interest on the value of the land. Interest cost is a factor of the rate charged and the value placed on an acre of cropland. The land cost averaged \$47 per acre or \$1.53 per bushel of soybeans. This amounted to about one third of the total soybean production costs.

Three other major growing costs were the out-of-pocket costs for fertilizer, seed and chemicals. These direct costs totalled \$50 per acre or \$1.66 per bushel. The total cost to grow soybeans averaged \$128 per acre or \$4.21 per bushel at the 30 bushel yield level.

Table 22.

SOYBEANS
Growing and Harvesting Costs
3,478 Acres, 18 Farms
New York, 1979

Item	Rates per Acre	Cost	
		Per Acre	Per Bushel
Number of farms			18
Acres per enterprise			193
Yield per acre, bushels			30
Growing Costs:			
Labor	1.3 hr	\$ 8	\$.24
Tractor	1.2 hr	7	.24
Equipment, large truck		8	.25
Custom work, equipment rent		2	.08
Land use		47	1.53
Manure, lime, cover crop		2	.06
Fertilizer: lbs. N-12, P-36, K-50		19	.63
Seed	69 lbs	13	.44
Chemicals		18	.59
Interest on operating capital		1	.04
All other		<u>3</u>	<u>.11</u>
Total growing cost		\$128	\$4.21
Harvesting Costs:			
Labor	.5 hr	\$ 3	\$.11
Equipment, self propelled		12	.38
All other		<u>1</u>	<u>.03</u>
Total harvesting cost		\$ 16	\$.52

The major cost to harvest the crop was for the combine itself. The portion of the total combine cost allocated to harvest the soybean crop on these farms amounted to \$12 per acre to cover ownership and operating costs. With high capacity combines and a low volume (less than one ton per acre) crop to harvest, only half an hour of labor per acre was used to harvest the crop and place it in farm storage. Total harvesting costs averaged \$16 per acre or \$.52 per bushel of soybeans.

Table 23 summarizes production costs and returns for the 18 New York soybean enterprises. Growing and harvesting costs together resulted in production costs averaging \$144 per acre and \$4.73 per bushel. In using an estimated harvest time return of \$6.00 per bushel for all growers, returns averaged \$183 per acre. The resulting profit was \$49 per acre and \$1.27 per bushel. With those figures, these enterprises were profitable in 1979 showing a return of \$1.27 for each dollar of cost invested in the crop. The available figures for soybeans indicate that the yield for New York in 1979 was above average which would, in itself, normally indicate above average returns for a crop.

Table 23. SOYBEANS
Costs and Returns
3,478 Acres, 18 Farms
New York, 1979

Item	Cost	
	Per Acre	Per Bushel
Number of farms		18
Acres per enterprise		193
Yield per acre, bushels		30
Costs to: Grow	\$128	\$4.21
Harvest	16	.52
Total production costs*	\$144	\$4.73
Returns	\$183	\$6.00
Profit	\$ 49	\$1.27
Return per dollar of cost		\$1.27

* Includes costs to place the soybeans into farm storage or on a truck if hauled off the farm at harvest time. Excludes storing costs and hauling costs to a buyer.

Average figures for these soybean enterprises are comprised of 18 individual enterprises representing a variety of inputs and conditions under which the crop was grown. Therefore, considerable variation may be

expected when individual results are compared. Table 24 lists several factors for each enterprise to illustrate this variation for some of the more important points of interest in the production of soybeans. Acreage has been omitted to protect grower identity.

Table 24.

SOYBEANS
Selected Factors
3,478 Acres, 18 Farms*
New York, 1979

Farm No.	Yield per Acre bu	Average Per Acre			Average per Bushel		Return per \$ of Cost \$
		Grow Cost \$	Harvest Cost \$	Profit \$	Costs \$	Returns \$	
8	21	102	12	10	5.52	6.00	1.09
3	45	204	19	47	4.96	6.00	1.21
9	32	116	14	61	4.10	6.00	1.46
12	30	127	13	40	4.68	6.00	1.28
19	23	102	8	30	4.73	6.00	1.27
2	41	138	17	93	3.75	6.00	1.60
17	33	119	16	65	4.04	6.00	1.49
7	27	107	15	38	4.56	6.00	1.31
13	31	145	19	25	5.22	6.00	1.15
5	29	123	18	30	4.94	6.00	1.22
18	28	132	20	17	5.40	6.00	1.11
6	21	120	18	-12	6.56	6.00	0.91
14	28	128	15	24	5.12	6.00	1.17
16	31	106	13	69	3.81	6.00	1.58
1	24	119	25	0	5.98	6.00	1.00
20	31	98	14	77	3.56	6.00	1.69
15	33	142	50	9	5.74	6.00	1.05
4	19	149	11	-48	8.61	6.00	0.70
Range	19 to 45	98 to 204	8 to 50	-48 to 93	3.56 to 8.61	6.00	0.70 to 1.69
Weighted Average	30	128	16	39	4.73	6.00	1.27

* Listed in descending order by acreage from 480 to 53 acres.

Results Based on Size of Enterprise -

Size of enterprise usually has some effect on various factors related to the enterprise. Economies of scale are generally experienced when specialized equipment or fixed costs can be spread over more units of production. To study the effects of size, this group of soybean enterprises were divided into two groups averaging 93 and 319 acres per enterprise.

As shown in Table 25, the larger enterprise group had higher yields, growing costs per acre and profits. The larger enterprises had lower labor costs per acre and somewhat lower tractor and equipment costs. Land costs averaged \$48 per acre for larger enterprises as compared to \$42 per acre for the smaller ones. Fertilizer and seed costs were essentially the same for both groups with a \$2 per acre lower cost for chemicals by the larger size group.

Harvesting costs per acre were significantly lower for larger soybean enterprises. Most of this lower cost resulted from lower equipment costs per acre. Increased cost efficiency was realized as the combine was used to harvest more acres.

Profits between the two size groups were significantly different. The larger enterprises had profits averaging \$45 per acre compared to \$20 per acre profit for the smaller size group. With the harvest time return for soybeans estimated at \$6 per bushel for all growers, price had no effect on the variation in profits. Thus, cost and yield differences accounted for this variation.

The effect of size of enterprise was most notable in harvest equipment costs. Lower harvesting costs explain some of the higher profits. However, the greatest effect on profits between these two size groups occurred because of the difference in yields. The eight larger enterprises had yields averaging 31 bushels of soybeans per acre - three bushels or 10 percent higher than the smaller size group. With lower costs and higher yields per acre the larger enterprises proved to be more profitable not only on a per acre and bushel basis but also, of course, in total enterprise profits.

The following two tables - Tables 26 and 27 - indicate the range of selected factors between enterprises for the two groups.

Table 25.

SOYBEANS
Costs and Returns
by Size of Enterprise
18 Farms, New York, 1979

Item	Size of Enterprise		All Farms
	50 to 150 acres	200 to 500 acres	
Number of farms	10	8	18
Acres per enterprise	93	319	193
Yield per acre, bushels	28	31	30
- per acre -			
Costs:			
Growing	\$127	\$129	\$128
Harvesting	<u>20</u>	<u>14</u>	<u>16</u>
Total production costs	\$147	\$143	\$144
Returns	\$167	\$188	\$183
Profit	\$ 20	\$ 45	\$ 39
Return per dollar of cost	\$1.14	\$1.32	\$1.27
- per bushel -			
Costs:			
Growing	\$4.54	\$4.10	\$4.21
Harvesting	<u>.70</u>	<u>.46</u>	<u>.52</u>
Total production costs	\$5.24	\$4.56	\$4.73
Returns	\$6.00	\$6.00	\$6.00
Profit	\$.76	\$1.44	\$1.27

Table 26.

SOYBEANS
Selected Factors
for Enterprises of 50 to 150 Acres*
10 Farms, New York, 1979

Farm No.	Yield per Acre bu	Average Per Acre			Average per Bushel		Return per \$ of Cost \$
		Grow Cost \$	Harvest Cost \$	Profit \$	Costs \$	Returns \$	
13	31	145	19	25	5.22	6.00	1.15
5	29	123	18	30	4.94	6.00	1.22
18	28	132	20	17	5.40	6.00	1.11
6	21	120	18	-12	6.56	6.00	0.91
14	28	128	15	24	5.12	6.00	1.17
16	31	106	13	69	3.81	6.00	1.58
1	24	119	25	0	5.98	6.00	1.00
20	31	98	14	77	3.56	6.00	1.69
15	33	142	50	9	5.74	6.00	1.05
4	19	149	11	-48	8.61	6.00	0.70
Range	19 to 33	98 to 149	11 to 50	-48 to 77	3.56 to 8.61	6.00	0.70 to 1.69
Weighted Average	28	127	20	20	5.24	6.00	1.14

* Listed in descending order by acreage.

Table 27.

SOYBEANS
Selected Factors
for Enterprises of 200 to 500 Acres*
8 Farms, New York, 1979

Farm No.	Yield per Acre bu	Average per Acre			Average per Bushel		Return per \$ of Cost \$
		Grow Cost \$	Harvest Cost \$	Profit \$	Costs \$	Returns \$	
8	21	102	12	10	5.52	6.00	1.09
3	45	204	19	47	4.96	6.00	1.21
9	32	116	14	61	4.10	6.00	1.46
12	30	127	13	40	4.68	6.00	1.28
19	23	102	8	30	4.73	6.00	1.27
2	41	138	17	93	3.75	6.00	1.60
17	33	119	16	65	4.04	6.00	1.49
7	27	107	15	38	4.56	6.00	1.31
Range	21 to 45	102 to 204	8 to 19	10 to 93	3.75 to 5.52	6.00	1.09 to 1.60
Weighted Average	31	129	14	45	4.56	6.00	1.32

* Listed in descending order by acreage.

Results Based on Yield -

To study the effects of yield on soybean profits, the group of 18 enterprises were divided in thirds after being ranked according to yield. For the three groups, yields averaged 23, 30 and 38 bushels of soybeans per acre. Overall, yields for this group ranged from 19 to 45 bushels per acre as shown in Table 28.

Table 28.

SOYBEANS
Costs and Returns
According to Yield
18 Farms, New York, 1979

Item	Yield Range, Bushels per Acre			All Farms
	19 to 27	28 to 31	31 to 45	
Number of farms	6	6	6	18
Acres per enterprise	202	144	233	193
Yield per acre, bushels	23	30	38	30
- per acre -				
Costs:				
Growing	\$107	\$128	\$147	\$128
Harvesting	<u>13</u>	<u>16</u>	<u>18</u>	<u>16</u>
Total production costs	\$120	\$144	\$165	\$144
Returns	\$135	\$178	\$227	\$183
Profit	\$ 15	\$ 34	\$ 62	\$ 39
Return per dollar of cost	\$1.12	\$1.24	\$1.38	\$1.27
- per bushel -				
Costs:				
Growing	\$4.76	\$4.32	\$3.87	\$4.21
Harvesting	<u>.58</u>	<u>.54</u>	<u>.48</u>	<u>.52</u>
Total production costs	\$5.34	\$4.86	\$4.35	\$4.73
Returns	\$6.00	\$6.00	\$6.00	\$6.00
Profit	\$.66	\$1.24	\$1.65	\$1.27
- per acre -				
Other factors				
Land cost	\$ 39	\$ 45	\$ 54	\$ 47
Fertilizer cost	\$ 16	\$ 26	\$ 19	\$ 19
LB per acre : N	7	12	15	12
P	18	41	49	36
K	43	71	42	50
Seed cost	\$ 12	\$ 13	\$ 15	\$ 13
Chemical cost	\$ 14	\$ 13	\$ 24	\$ 18
Harvest equipment cost	\$ 9	\$ 12	\$ 13	\$ 11

There was a definite, direct relationship between yield and several factors shown in the analysis of these groups of soybean enterprises. Growing costs increased as yields increased. While this was most significant with land and seed costs per acre, costs for chemicals, labor and equipment also tended to increase as yields improved. Chemical costs will be treated in greater depth later in this report. Fertilizer costs varied greatly but cost per acre and the quantity of nutrients per acre also tended to increase with yield.

Harvesting costs, primarily for equipment, increased with higher yields. However, the additional quantity of soybeans harvested and placed in storage did not account for much of the added cost. Higher harvest equipment costs were more related to the age and value of the combine and, particularly, to the number of total acres harvested by the combine.

With a constant return of \$6 per bushel for all producers and in spite of higher costs, enterprises with higher soybean yields had significantly higher profits. Table 28 shows a substantial difference in profit per acre and per bushel as well as in return per dollar of cost as the three yield level groups of enterprises are compared.

Tables 29, 30 and 31 indicate the range of several selected factors within each yield level group of enterprises.

Table 29. SOYBEANS
Selected Factors
Enterprises with Yields of 19 to 27 Bushels per Acre
6 Farms*, New York, 1979

Farm No.	Yield per Acre bu	Average per Acre			Average per Bushel		Returns per \$ of Cost \$
		Grow Cost \$	Harvest Cost \$	Profit \$	Costs \$	Returns \$	
8	21	102	12	10	5.52	6.00	1.09
19	23	102	8	30	4.73	6.00	1.27
7	27	107	15	38	4.56	6.00	1.31
6	21	120	18	-12	6.56	6.00	0.91
1	24	119	25	0	5.98	6.00	1.00
4	19	149	11	-48	8.61	6.00	0.70
Range	19 to 27	102 to 149	8 to 25	-48 to 38	4.56 to 8.61	6.00	0.70 to 1.31
Weighted Average	23	107	13	15	5.34	6.00	1.12

* Listed in descending order by acreage.

Table 30. SOYBEANS
Selected Factors
Enterprises with Yields of 28 to 31 Bushels per Acre
6 Farms*, New York, 1979

Farm No.	Yield per Acre bu	Average per Acre			Average per Bushel		Returns per \$ of Cost \$
		Grow Cost \$	Harvest Cost \$	Profit \$	Costs \$	Returns \$	
12	30	127	13	40	4.68	6.00	1.28
13	31	145	19	25	5.22	6.00	1.15
5	29	123	18	30	4.94	6.00	1.22
18	28	132	20	17	5.40	6.00	1.11
14	28	128	15	24	5.12	6.00	1.17
20	31	98	14	77	3.56	6.00	1.69
Range	28 to 31	98 to 145	13 to 20	17 to 77	3.56 to 5.40	6.00	1.11 to 1.69
Weighted Average	30	128	16	34	4.86	6.00	1.24

* Listed in descending order by acreage.

Table 31. SOYBEANS
Selected Factors
Enterprises with Yields of 31 to 45 Bushels per Acre
6 Farms*, New York, 1979

Farm No.	Yield per Acre bu	Average per Acre			Average per Bushel		Return per \$ of Cost \$
		Grow Cost \$	Harvest Cost \$	Profit \$	Costs \$	Returns \$	
3	45	204	19	47	4.96	6.00	1.21
9	32	116	14	61	4.10	6.00	1.46
2	41	138	17	93	3.75	6.00	1.60
17	33	119	16	65	4.04	6.00	1.49
16	31	106	13	69	3.81	6.00	1.58
15	33	142	50	9	5.74	6.00	1.05
Range	31 to 45	106 to 204	13 to 50	9 to 93	3.75 to 5.74	6.00	1.05 to 1.60
Weighted Average	38	147	18	62	4.35	6.00	1.38

* Listed in descending order by acreage.

Effects of Weed Control on Yields and Profits -

Good weed control is essential to good yields in soybeans. Chemical herbicides were used to various extents by all growers in this study. Eight growers planted all of their soybeans in 30 inch rows; eight growers used a drill to plant soybeans, and two growers used both wide and narrow row systems. Seven of those who planted in 30 inch rows used some cultivation in addition to herbicides to control weeds.

When the 18 soybean records are analysed on the basis of chemical cost per acre as a measure of weed control effort some significant relationships are evident. The assumption is made that, within reason, higher chemical costs and selective cultivation generally result in more effective weed control. Recognizing the general nature of that assumption, the group of records were ranked by chemical cost per acre to study the effect of weed control on yields and profits.

Table 32. Relationship of Weed Control Costs to Yield and Profits
18 Soybean Enterprises
Ranked by Chemical Cost per Acre
New York, 1979

Group	No. of Entr.	Acres per Entr. ac.	Chemical Cost/Acre \$	Yield per Acre bu.	Profit per Acre \$
Low Half	9	210	12	26.3	31
High Half	9	177	24	35.3	48
Low Third	6	213	11	24.5	20
Middle Third	6	165	15	29.9	42
High Third	6	197	27	37.3	57
All Enterprises	18	193	18	30.5	39

Whether the group was divided in half or in thirds the direct relationship of good weed control to yields and profits persisted (Table 32). The effect of cultivation on yield was ignored because soybean acreage was cultivated in each group to a similar extent. Each of the group comparisons in Table 18 illustrates that yields and profits per acre improve as weed control becomes more effective when measured by chemical costs per acre. Weed control efforts must be determined by conditions to arrive at optimum levels of control. Appropriate chemicals applied in the proper way combined with selective cultivation seems to provide potential for the highest profits per acre.

Determining the Break Even Yield -

Good yields are critical to profitable crop production. However, profits are also affected by production costs and returns per unit of production. If any two of those three factors can be known or estimated, the third factor can be determined from Table 33. For example, the results of this study show that soybeans for these 18 enterprises cost an average of \$144 per acre to produce. Assuming a \$6 return per bushel for the crop, a grower can see, by interpolating, that he needs a yield of 24 bushels of soybeans per acre to break even or to cover all his costs. Similarly, a grower who knows his costs and expected yield can tell what price he needs to receive to break even on his crop.

Table 33.

SOYBEANS
Break Even Yields
at Various Cost and Return Levels

Total Cost per Acre	Yield Necessary to Break Even with Returns per Bushel Averaging:				
	\$5.00	\$6.00	\$7.00	\$8.00	\$9.00
	- Bushels per Acre -				
\$100	20	17	14	13	11
125	25	21	18	16	14
150	30	25	21	19	17
175	35	29	25	22	19
200	40	33	29	25	22
225	45	38	32	28	25