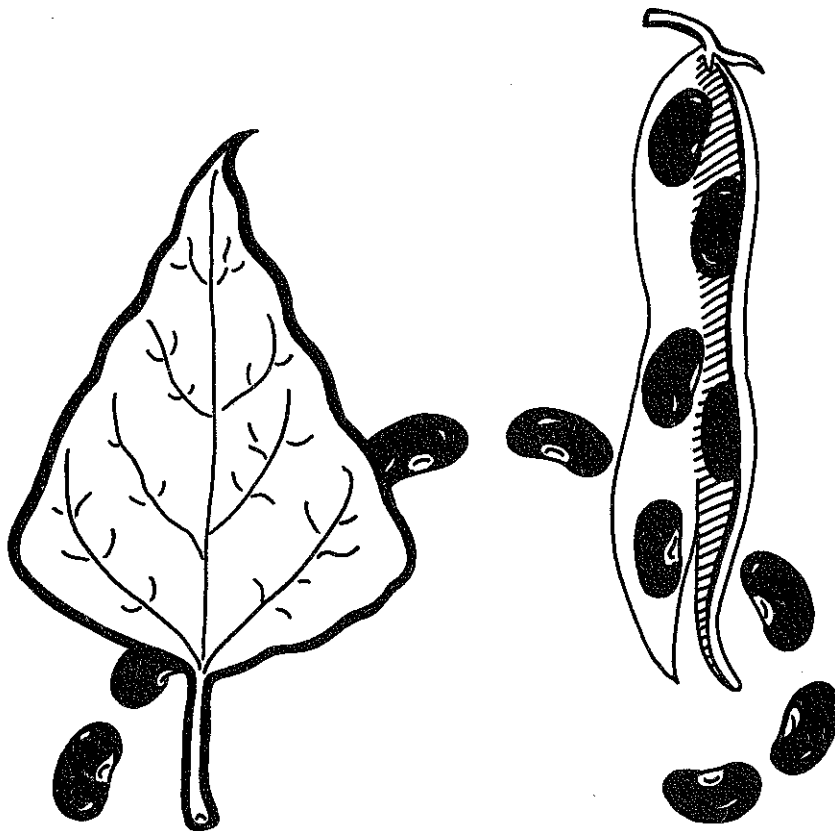


**COSTS AND RETURNS**  
in  
**PRODUCING**  
**RED KIDNEY BEANS**  
**1958**



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COSTS AND RETURNS IN PRODUCING  
RED KIDNEY BEANS

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COSTS AND RETURNS IN PRODUCING  
RED KIDNEY BEANS

During the years 1947 to 1958 about seven per cent of the U. S. dry bean crop was produced in New York State (table 1).

Table 1. U. S. DRY BEAN PRODUCTION, BY STATES

State	Average 1947-56	1957	1958
	1,000 bags <u>1/</u>	1,000 bags <u>1/</u>	1,000 bags <u>1/</u>
California	4,307	3,596	4,091
Michigan	4,038	3,508	5,199
Idaho	2,289	2,128	2,697
Colorado	1,897	2,063	1,820
New York	1,428	1,165	1,311
Nebraska	1,055	969	986
Washington	352	838	1,365
All other	1,459	1,359	1,512
U. S.	16,825	15,626	18,981

1/ 100 lb. bags cleaned

Source: Crop Production, Annual Summary

The 1958 crop of edible dry beans was the fourth largest on record. Production was 21 per cent above 1957 and 13 per cent above the ten-year average. The acreage harvested was 16 per cent above 1957. New York State production was about average in spite of unfavorable weather at harvest time. As of December 1, 1958, the USDA estimated an average yield for the 1958 crop of 1,150 pounds per acre in New York.

In 1958 red kidney bean production was eight per cent of the total U. S. dry bean crop and 75 per cent of the New York crop. Eighty per cent of the U. S. red kidney bean production was grown in New York.

For 50 years U. S. per capita consumption of dry beans has averaged close to 7.5 pounds per year. There is no apparent trend either way in this rate although consumption appears to have been higher during periods of depression or rationing.

According to the 1954 Census for New York, 10 counties located primarily in the Central Plain had 86 per cent of the dry bean acreage (table 2).

Table 2.

DRY BEAN ACREAGE  
By County, New York, 1954

County	Acres
Cayuga	17,646
Ontario	17,028
Livingston	13,819
Monroe	12,719
Wayne	12,070
Seneca	8,370
Genesee	7,509
Yates	6,695
Wyoming	6,077
Steuben	6,063
All other counties	17,486
New York	125,482

Source: 1954 Census

The Study

The goal of this study was to aid New York State bean growers in making intelligent adjustments in their businesses by providing them with data for red kidney beans which they could use in making comparisons. To do this input-output and cost-returns data were obtained from individual growers, primarily in the counties of Cayuga-Seneca and Livingston-Wyoming having 10 or more acres of red kidneys for the 1958 crop year (figure 1). Thirty-seven records were obtained in the Livingston-Wyoming area, and 40 were obtained in the Cayuga-Seneca area. In both areas a similar number of records were obtained from growers in each of five size categories.

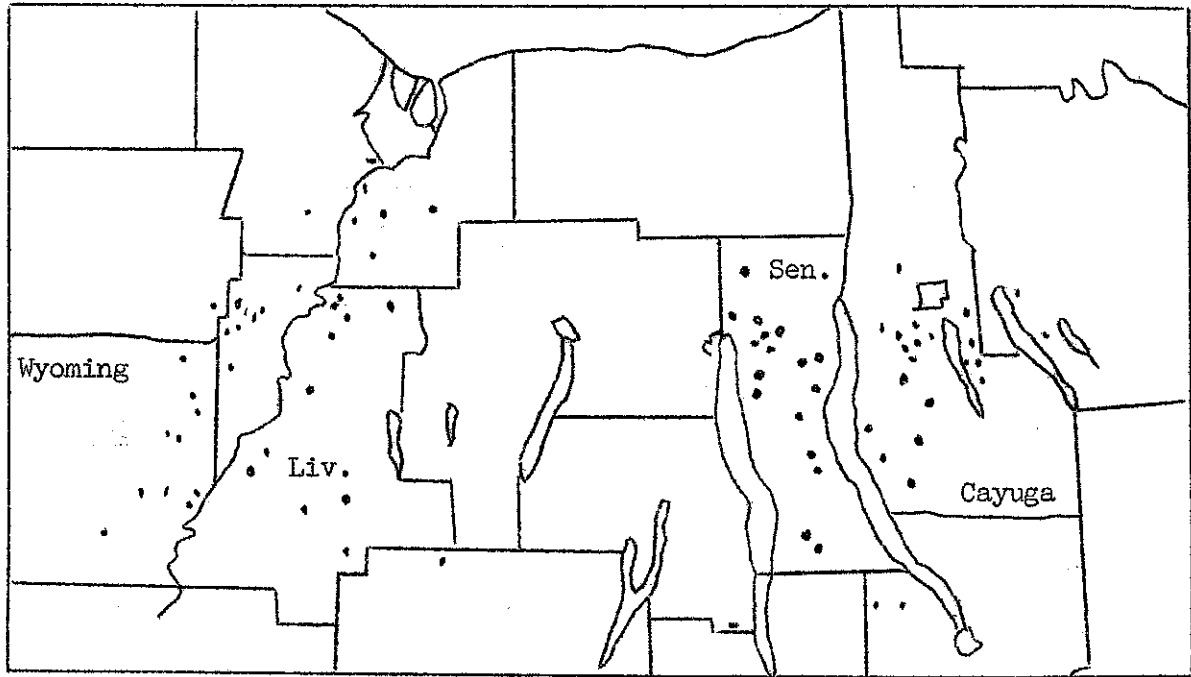


Figure 1. LOCATION OF RED KIDNEY BEAN PRODUCERS STUDIED  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Description of Farms

Records were obtained not to present averages for the area but rather to study production of different size enterprises. Comparisons were obtained between the Cayuga-Seneca and Livingston-Wyoming areas.

In Cayuga-Seneca growers owned three-fourths of the land they operated as compared with two-thirds for the Livingston-Wyoming growers (table 3). In Cayuga-Seneca a higher proportion of total land operated was cropland. Of this one-fourth was planted to vegetable crops, including dry beans, and half was used for corn and small grains. In Livingston-Wyoming about one-third of the cropland was devoted to vegetable crops and one-third to corn and small grains.

Table 3.

GENERAL ORGANIZATION OF FARMS  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

	Cayuga-Seneca	Livingston-Wyoming
	(acres)	(acres)
<u>Land tenure</u>		
Owned	278	374
Rented	89	186
Total operated	<u>367</u>	<u>560</u>
<u>Land use</u>		
Cropland	280	369
All other	87	191
Total operated	<u>367</u>	<u>560</u>
<u>Use of cropland</u>		
Vegetable crops	71	130
Corn and small grains	133	117
Forage, pasture or idle	76	122
Total acres of crops	<u>280</u>	<u>369</u>

Generally, in both areas, growers with larger bean enterprises devoted a higher proportion of their total productive work to red kidney beans. In Cayuga-Seneca this proportion ranged from 13 per cent for the smaller enterprises to 31 per cent for the larger enterprises. In Livingston-Wyoming the range was from 6 to 25 per cent.

The proportion of productive work devoted to livestock was lower on farms which had larger bean enterprises. From 23 to 60 per cent of productive man work units were devoted to livestock in Cayuga-Seneca. In Livingston-Wyoming the range was from 33 to 49 per cent.

COSTS AND RETURNS

Practices and Inputs

Rotation: Generally red kidneys followed either hay, wheat, corn or beans in the rotation. No significant relationship of yield per acre to crops raised the previous year was discovered. Sixty-five per cent of the growers indicated that it was their practice to plant beans after beans. Their yields were not significantly different from the average for the area.

Fitting: After plowing, the common practice was to fit the ground about five times. The number of fitting operations ranged from two to twelve.

Planting: All except three growers planted their beans during June. Almost half the growers planted beans during the week ended June 21. Forty per cent of the growers planted beans in 32-inch rows, 26 per cent planted in 30-inch rows and 18 per cent planted in 36-inch rows. These varying row spacings had little effect on yields.

Weed control: Growers cultivated beans one to four times. The average was about two times. Nine Cayuga-Seneca growers and eight Livingston-Wyoming growers used a pre-emergence weed spray. On the average these growers cultivated the same number of times as other growers in the area, and their yields were about the same as the average for the area. Fourteen Livingston-Wyoming and three Cayuga-Seneca growers did some hand weeding.

Insect control: Efforts to control insects were quite different in the two areas. In Livingston-Wyoming 32 growers did some spraying or dusting and obtained an average yield of 1,519 pounds. Five growers did no spraying or dusting and obtained an average yield of 1,247 pounds. Seven Cayuga-Seneca growers did some dusting or spraying and obtained yields averaging 200 pounds per acre more than growers who did no spraying or dusting.

Table 4.

INPUTS TO GROW AND HARVEST  
ONE ACRE OF RED KIDNEY BEANS  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Inputs	Your Farm	Cayuga-Seneca	Livingston-Wyoming
Number of farms		40	37
Acres of beans		60	70
Yield (lbs., net)	_____	1,203	1,482
Man labor (hours)			
Growing:			
Operator and family	_____	4.1	4.6
Hired	_____	1.4	3.2
Harvesting:			
Operator and family	_____	4.0	3.2
Hired	_____	1.2	1.3
Total man hours	_____	10.7	12.3
Tractor hours	_____	7.1	7.8
Truck miles	_____	3.9	4.9
Seed (lbs.)	_____	72	75
Commercial fertilizer (lbs.)			
N	_____	25	29
P <sub>2</sub> O <sub>5</sub>	_____	48	52
K <sub>2</sub> O	_____	48	50

Labor: Red kidney beans is a crop with a low labor requirements (table 4). About six hours of labor were required per acre to grow beans in Cayuga-Seneca while almost eight were necessary in Livingston-Wyoming. In both areas an acre was harvested with about five man hours. Thus the two areas differed only slightly in the total number of man hours required to grow and harvest one acre of beans.

Regardless of the size of the enterprise about the same number of man hours was required to grow an acre of beans. However, growers with 50 or more acres required three to four hours less labor per acre for harvesting than did smaller growers.

Tractor and truck: Slightly fewer tractor hours were necessary in Cayuga-Seneca than Livingston-Wyoming. In both areas the large enterprises required about one hour less per acre than the small ones. Four to five truck miles per acre were all that were required.

Seed: Sixty-nine per cent of the growers planted California seed, six per cent planted Idaho seed and 25 per cent planted a combination of the two. All except four growers planted treated seed. The average quantity of seed planted per acre was the same for both areas, but the variability from farm to farm was wide. Some growers planted as little as 51 pounds per acre; others planted as much as 106 pounds.

Commercial fertilizer: All growers applied commercial fertilizer. Some or all of the fertilizer applied on red kidney bean ground by 32 Cayuga-Seneca and 37 Livingston-Wyoming growers was 1-2-2 ratio. Ten growers applied fertilizers with a ratio of 1-1-1, and 20 growers applied some fertilizers with various other ratios. In each area the large enterprises applied more pounds of commercial fertilizer per acre than the small ones. All except one grower banded fertilizer at planting time. Seven growers broadcast some fertilizer before planting.

#### The Cost of Producing One Acre of Red Kidney Beans

Growing costs: Charges for man labor, commercial fertilizer, seed and land amounted to two-thirds of the growing costs (table 5). It is interesting to note that the cost to grow one acre of red kidneys was about the same for all growers who had 30 or more acres. Growers with acreages of 10 to 29 acres had higher growing costs.

Table 5. AVERAGE COST OF GROWING ONE ACRE OF RED KIDNEY BEANS  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Item	Your Farm	Cayuga-Seneca	Livingston-Wyoming
Number of farms		40	37
Acres of beans		60	70
Yield (lbs., net)		1,203	1,482
<u>Growing costs</u>			
Man labor		\$ 7.88	\$10.78
Power and equipment:			
Tractor		6.09	6.24
Special equipment		0.64	1.06
General equipment		5.00	5.00
Truck		0.22	0.30
Fertilizers:			
Commercial		11.53	12.56
Manure		1.96	5.95
Cover crop		0.43	1.15
Lime		0.27	0.38
Custom work		0.02	0.37
Seed		10.82	11.13
Spray materials <sup>1/</sup>		0.68	2.56
Land		10.50	14.24
General overhead		2.24	2.87
Interest		.87	1.12
Total growing cost		\$59.15	\$75.71

<sup>1/</sup> This includes dust and spray materials for insect and weed control.

Total growing cost in Livingston-Wyoming was \$16.56 higher than that in Cayuga-Seneca. Although the extra cost for man labor, commercial fertilizer, manure, spray materials and land make up \$13.54 of the difference between the two areas, all other minor costs were also higher.

In Cayuga-Seneca growing costs varied from \$45 to \$82 per acre and averaged \$37 (table 6). Per acre growing costs varied from \$41 to \$109 in Livingston-Wyoming with an average of \$68.76. Production practices and inputs were more nearly the same from farm to farm in Cayuga-Seneca than in Livingston-Wyoming.

Table 6. DISTRIBUTION OF GROWING COSTS PER ACRE  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Growing Cost	Number of farms	
	Cayuga-Seneca	Livingston-Wyoming
\$ 50 or less	8	2
51 - 60	17	5
61 - 70	11	7
71 - 80	3	12
81 - 90	1	1
91 - 100	0	8
101 or more	0	2
Total	40	37

Harvesting costs: When considering bean harvesting costs the question often arises as to how many acres of beans a grower must have to make it economical for him to own a bean machine. This study does not give a direct answer, but some indications are apparent. Forty-four of the growers included in this study owned bean machines. None of the machines harvested less than 44 acres, and some harvested as many as 350 acres. Including custom work for others the machines harvested an average of 136 acres. Large growers had acres enough, and smaller growers did custom work to spread the costs and keep the cost per acre down. The total harvesting cost per acre was about the same for growers who owned as for those who hired a bean machine. This would indicate that the principal advantage to a grower of owning a bean machine is to get his own beans harvested when they are ready and the weather is favorable.

The cost of harvesting an acre of beans was about the same in the two areas (table 7). The cost of labor was the largest item, followed by the charge for special equipment including the bean puller, side delivery rake, and/or windrower and the bean machine. The charge for custom harvesting includes the cost of the machine and an operator.

Growers with small enterprises had higher harvesting costs per acre than those with large enterprises. Most of the difference resulted from higher labor costs.

Table 7. AVERAGE COST OF HARVESTING ONE ACRE OF RED KIDNEY BEANS  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Item	Your Farm	Cayuga-Seneca	Livingston-Wyoming
Number of farms		40	37
Acres of beans		60	70
Yield (lbs., net)		1,203	1,482
<u>Harvesting costs</u>			
Man labor		\$ 7.15	\$ 6.38
Power and equipment:			
Special equipment		4.66	4.90
Tractor		2.65	2.56
Truck		0.45	0.47
Custom work		3.59	2.75
Total harvesting cost		\$18.50	\$17.06

In Cayuga-Seneca the harvesting cost per acre ranged from \$16 to \$58, but only two growers had costs of more than \$30. In Livingston-Wyoming the range was from \$6 to \$31. In both areas the concentration was heavy about the average (table 8).

Table 8. DISTRIBUTION OF HARVESTING COSTS PER ACRE  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Harvesting cost	Number of farms	
	Cayuga-Seneca	Livingston-Wyoming
Less than \$10	1	3
10 - 15	19	14
16 - 20	9	11
21 - 25	7	6
Over 25	4	3
Total	40	37

Total production cost: Total production cost in Cayuga-Seneca averaged \$77.65 per acre with growing costs accounting for 76 per cent of the total. In Livingston-Wyoming 82 per cent of total production cost of \$92.77 was for growing. Harvesting cost per acre was \$18.00 for each area. With 1958 prices the higher yield obtained in Livingston-Wyoming about offset the higher costs of production there.

Total Returns and Profits per Acre

Gross returns on a crop depend upon the yield and the price received. In Cayuga-Seneca the returns ranged from \$28 to \$129 per acre and in Livingston-Wyoming from \$28 to \$133. There were no complete crop failures, but in some cases beans were left unharvested. Large gains and losses per acre were not encountered and are not to be expected with an extensive crop like red kidney beans.

Yield per acre: The yield that is important to the farmer is the amount of dry, clean, picked beans that he is paid for. Production costs on all acres planted are part of the cost of producing the beans sold even though some acres may not be harvested. Therefore, in this study yield is calculated by dividing the total pounds of dry, clean, picked beans sold by the number of acres planted. Yield then is the net pounds of beans sold per acre planted.

There was no consistent relationship between size of the bean enterprise and yield per acre. Yields ranging from 449 pounds to 1,959 pounds were obtained in Cayuga-Seneca (table 9). In Livingston-Wyoming the lowest yield was 500 pounds and the highest 2,277.

Table 9.

DISTRIBUTION OF YIELD PER ACRE  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Yield (lbs. net)	Number of farms	
	Cayuga-Seneca	Livingston-Wyoming
Less than 500	1	0
500 - 800	5	2
801 - 1,100	12	4
1,101 - 1,400	9	9
1,401 - 1,700	8	11
1,701 - 2,000	5	7
Over 2,000	0	4
Total	40	37

Price: The price received by each grower for beans sold was used in calculating returns and profits. Beans in commercial storage were valued at the market price on the day the harvesting data were obtained. Beans in farm storage were valued at the market price less \$0.10 per hundredweight to allow for hauling costs. As far as the grower is concerned the important price figure is the net price per hundredweight, which is calculated by dividing the net cash received by the number of hundredweight of net beans sold. The price quoted by the buyer may differ from the net price the farmer receives depending on the pick-out and moisture percentages. 2/

Since the data on yield and price were collected at the close of 1958 the slightly higher prices received after the first of the year did not enter into the calculations. Cayuga-Seneca growers received prices ranging from \$5.82 to \$7.07 while in Livingston-Wyoming prices received ranged from \$3.24 to \$7.45. Wet low-quality beans accounted for the lowest prices. Growers who put good quality beans on the early fall market received the highest prices. The average prices received per hundredweight were \$6.45 in Cayuga-Seneca and \$6.36 in Livingston-Wyoming.

Profit or loss: Even with the low prices of 1958 about half of the growers in each area made a profit on red kidney beans. In Cayuga-Seneca the range was from a loss of \$76 to a gain of \$64 per acre. The range in Livingston-Wyoming was from a loss of \$71 to a gain of \$61 per acre. Differences in per acre growing and harvesting costs alone do not account for these wide variations in returns. Price and yield were most important.

#### Yield Necessary to Break-even

The relationship between yield and profit for Cayuga-Seneca is readily apparent if one draws a line between the two dots marked X (figure 2). Each dot represents one enterprise by showing the yield and net return per acre. If yield were the only factor affecting profits each dot in the diagram would fall on the diagonal line drawn between the two dots marked X. The fact that the dots are concentrated around this line indicates that yield is a most important factor in determining profits. The growers with higher yields made the profits. With average growing costs of \$59, average harvesting costs of \$18 and an average price of \$6.45, a yield of 1,200 pounds per acre was necessary to break-even.

2/ For example, a grower who delivered 100 pounds of beans with 3 per cent pick and 21 per cent moisture at a market price of \$6.00 would receive a net price per hundredweight of \$5.49. He would be docked one pound for each per cent of pick and two pounds for each per cent of moisture above 18 per cent for a total of nine pounds dock. In addition he would be charged \$0.07 per pounds to pick-out three pounds or \$0.21 and \$0.25 per hundredweight, gross weight for drying the beans if the moisture is above 20 per cent for a total of \$0.46. The buyer is quoting \$6.00 per hundredweight for net beans; so the grower sells 91 pounds of net beans at that rate for \$5.46, but \$0.46 is deducted for pick and drying so that he receives \$5.00 net. This amounts to a net price per hundredweight of \$5.49.

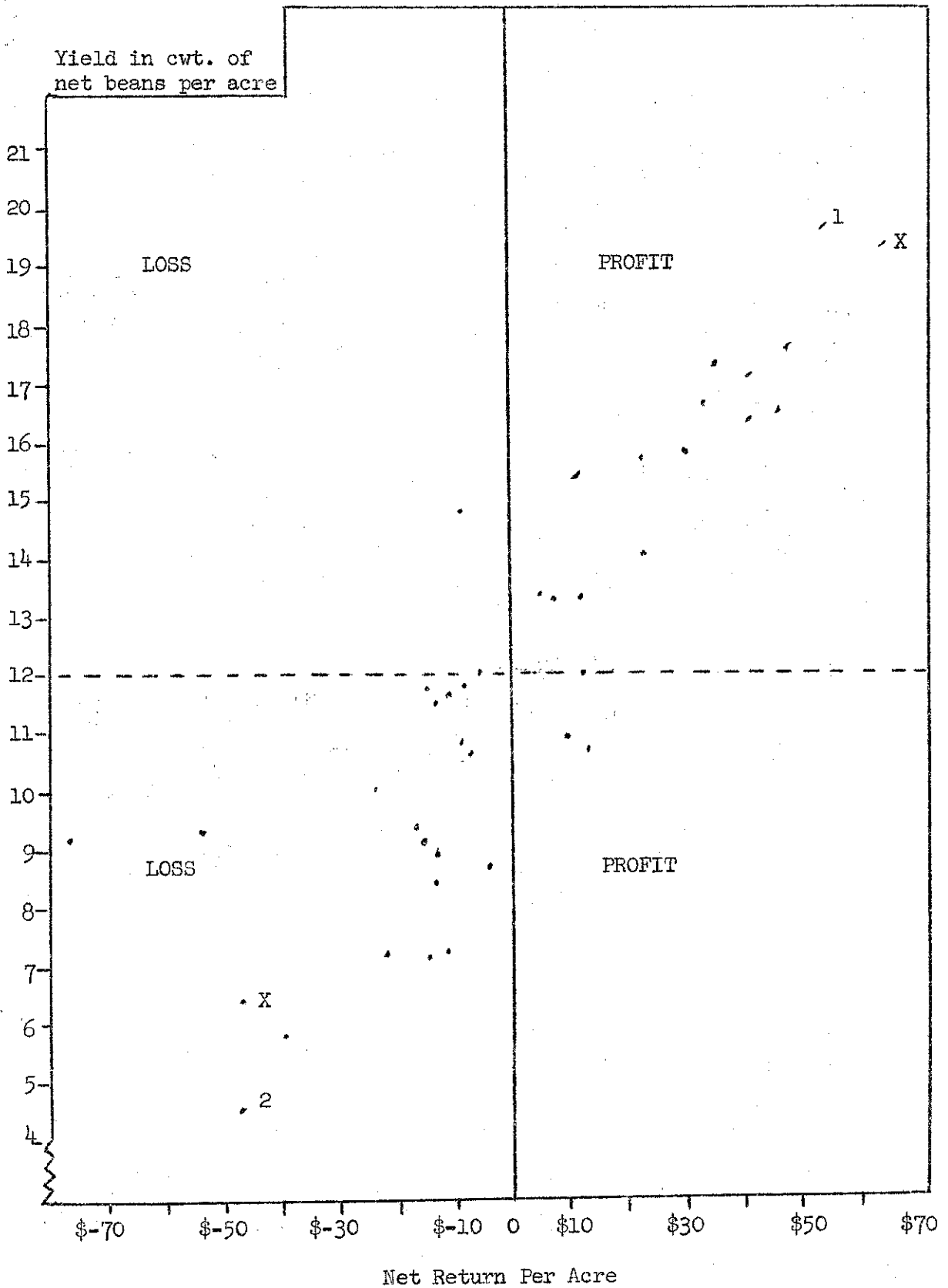


Figure 2. RELATIONSHIP BETWEEN YIELD AND NET RETURN PER ACRE OF RED KIDNEY BEANS 40 Farms, Cayuga and Seneca Counties, New York, 1958

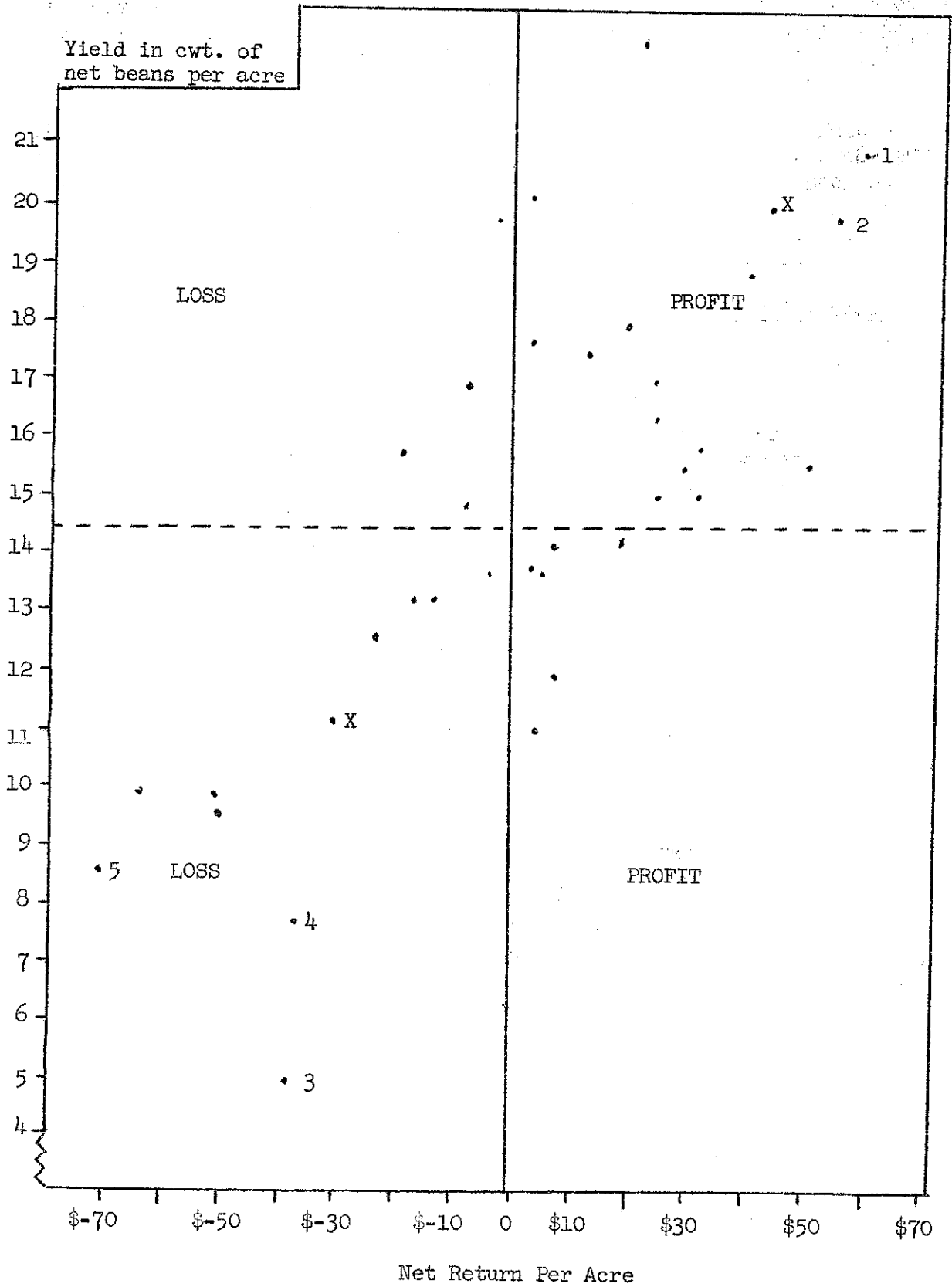


Figure 3.

RELATIONSHIP BETWEEN YIELD AND NET RETURN  
PER ACRE OF RED KIDNEY BEANS  
37 Farms, Livingston and Wyoming Counties, New York, 1958

Grower experience in Livingston-Wyoming also indicates that high yields bring high profits (figure 3). A diagonal line drawn between the two dots marked X gives a general indication of the relationship between yield and profits. With higher growing costs and a slightly lower net price a yield of 1,450 pounds was necessary to break-even in Livingston-Wyoming.

A high yield is not an iron-clad guarantee of profits. One grower in Cayuga-Seneca and four growers in Livingston-Wyoming had better yields than were necessary to break-even under average conditions, but they lost money because their costs were higher than average. On the other hand some growers with good cost control were able to show a profit with yields lower than those required to break-even under average conditions.

Determining break-even points: A producer can calculate the break-even point for his own enterprise if he knows three things: 1) the cost of growing one acre of red kidneys up to the point of harvest 2) the harvesting costs per acre 1/ and 3) the price received or expected per hundredweight.

As the price increases, with given costs, the yield necessary to break-even decreases and vice versa. Each producer can estimate his growing and harvesting costs so that he can calculate his own break-even point. Any production above the break-even point is profit.

#### THE EFFECT OF DIFFERENT PRACTICES ON YIELDS AND PROFITS

As previously noted yields are the most important factor in determining profits and losses in producing red kidney beans. Indeed, the grower who does not consistently obtain bean yields above the break-even point might very well consider possible alternatives for more profitable use of his inputs and resources.

It is most important, even though difficult, to determine which practices and methods produce the highest yields. Every year in a given area there are wide variations from farm to farm in yields and profits. These differences are due to the different kinds and amounts of resources used in producing the crop and the differences in management. The weather is an important factor, but in any area there are growers who manage to get crops planted and harvested while their neighbors fail to do so.

Because so many different practices, inputs and physical conditions affect the yield of a crop, no single practice or input is most important. Furthermore, they are related. Full utilization of fertilizer is closely related to the amount of moisture available during the season. Full benefits from an insect control program will not be realized unless weeds are also controlled. All the recommended practices and careful management will avail a grower nothing if his soil is poorly suited to red kidney bean production. These relationships make it hard to say precisely how much effect each had on yields and returns.

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1/ Per acre harvesting costs were about the same regardless of yield.

Commercial Fertilizer

For red kidney bean production the limiting plant nutrients are nitrogen, phosphorus and potash. Over a given range, heavier applications of these nutrients result in higher yields. However, a point is reached where additional fertilizer does not increase yields sufficiently to pay for the additional cost of the fertilizer. At this point something besides fertilizer is limiting higher production.

Nitrogen: Recommendations on the use of nitrogen for dry bean production call for the application of 24 to 43 pounds of N per acre. In both areas about one-third of the growers applied less than 24 pounds per acre (table 10). About two-thirds of the Cayuga-Seneca growers applied N at the recommended rates. The range was 9 to 45 pounds per acre. Some Livingston-Wyoming growers applied as much as two times the recommended amounts. Their range was 8 to 97 pounds per acre.

Table 10. POUNDS OF NITROGEN APPLIED PER ACRE AS RELATED TO YIELDS AND OTHER FACTORS  
40 Farms, Cayuga and Seneca Counties and 37 Farms,  
Livingston and Wyoming Counties, New York, 1958

Rate of Application	Number of farms	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Yield per acre
(lbs. per acre)			(lbs. per acre)		(net cwt.)
<u>Cayuga-Seneca:</u>					
Low - (9 - 20)	13	17	36	38	968
Medium - (21 - 28)	12	24	50	48	1,292
High - (30 - 45)	15	33	58	58	1,335
<u>Livingston-Wyoming:</u>					
Low - (8 - 21)	13	18	37	35	1,317
Medium - (22 - 32)	13	26	53	48	1,562
High - (35 - 97)	11	46	70	70	1,583

Although fertility levels of fields were not obtained prior to applying commercial fertilizer, the records indicate in both areas that growers with high applications of nitrogen obtained the highest yields.

Fertilizing at high rates may not be the most profitable even though higher yields are obtained. For example in Livingston-Wyoming, growers who made medium applications of N had yields averaging 245 pounds per acre more than growers who made light applications. Growers who made heavy applications of N had yields that averaged 21 pounds higher than growers who made medium applications. For the purpose of illustration assume that nitrogen applied on the field is worth 15 cents per pound and that beans

are selling for six cents per pound. For an increased expenditure of \$1.20 for eight pounds of N an increased return of \$14.70 was obtained by making medium instead of light applications of N. Growers who made heavy applications spent \$3.00 for additional fertilizer but obtained additional beans worth only \$1.26. With these assumptions Cayuga-Seneca growers who made the heaviest applications of nitrogen obtained enough additional yield to more than offset the additional cost of fertilizer. In view of these experiences it would seem that an application of about 40 pounds of N per acre is most profitable for red kidney bean production under average conditions.

Phosphate: The general recommendation for applying phosphate when growing dry beans was 48 to 86 pounds per acre. The amounts applied ranged from 24 to 96 pounds in Cayuga-Seneca and from 15 to 100 pounds in Livingston-Wyoming (table 11). The group of growers in each area who made light applications did not comply with the minimum recommendations.

Table 11. POUNDS OF PHOSPHORUS APPLIED PER ACRE AS RELATED TO YIELD AND OTHER FACTORS  
40 Farms, Cayuga and Seneca Counties and 37 Farms, Livingston and Wyoming Counties, New York, 1958

Rate of application	Number of farms	P <sub>2</sub> O <sub>5</sub>	N	K <sub>2</sub> O	Yield per acre
(lbs. per acre)		(lbs. per acre)			(net. cwt.)
<u>Cayuga-Seneca</u>					
Low - (24 - 37)	10	31	19	32	1,075
Medium - (40 - 56)	18	47	25	46	1,193
High - (60 - 96)	12	66	31	66	1,324
<u>Livingston-Wyoming</u>					
Low - (15 - 40)	11	34	19	35	1,244
Medium - (42 - 59)	13	48	24	40	1,616
High - (61 - 100)	13	72	42	72	1,550

Growers who made heavy applications of phosphorus also applied larger amounts of nitrogen and potash. With increased applications of phosphate Cayuga-Seneca growers obtained higher yields, but Livingston-Wyoming growers who made the heaviest applications had lower yields than those who made medium applications. This indicates that some growers probably paid for and applied phosphate which was not needed. A soil test may show factors other than phosphate to be limiting.

Potash: Recommendations on the use of potash for dry bean production call for the application of 48 to 86 pounds of K<sub>2</sub>O per acre. In Cayuga-

Seneca the amounts applied varied from 18 to 96 pounds and in Livingston-Wyoming from 14 to 100 pounds (table 12). Growers who made medium to heavy applications complied with recommendations.

Table 12. POUNDS OF POTASH APPLIED PER ACRE AS RELATED TO YIELD AND OTHER FACTORS  
40 Farms, Cayuga and Seneca Counties and 37 Farms, Livingston and Wyoming Counties, New York, 1958

Rate of application	Number of farms	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>	Yield per acre
(lbs. per acre)		(lbs. per acre)			(net cwt.)
<u>Cayuga-Seneca</u>					
Low - (18 - 37)	11	29	20	34	1,076
Medium - (40 - 56)	15	47	26	47	1,253
High - (60 - 96)	14	65	29	62	1,249
<u>Livingston-Wyoming</u>					
Low - (14 - 38)	10	28	19	38	1,391
Medium - (40 - 61)	15	46	25	45	1,524
High - (64 - 100)	12	73	42	73	1,505

It appears that potash was not the limiting factor to additional yields in either area. Growers who applied medium amounts had slightly higher yields than those who made light applications, but this must be discounted because at least part of this was due to higher applications of nitrogen and phosphorus. In both areas growers who applied large amounts had slightly lower yields than those who made medium applications. Some growers applied more potash than was necessary or profitable.

#### Total Cost of Growing

The amount of resources and inputs used in growing one acre of red kidney beans varied widely. There seems to be no consistent relationship between growing costs and yield or profits (table 13). In both areas growers who had higher growing costs also had higher charges for land use and total nutrients added. In Cayuga-Seneca growers with high costs obtained lower yields than did growers with low costs. These growers with the highest costs and lowest yields had the biggest losses. In Livingston-Wyoming the group of growers with medium growing costs had the lowest yields and the largest loss. Yields do not necessarily increase with additional expenditures. To make a profit in the bean business a grower must have a combination of below average costs and better than average yield.

Table 13. THE COST OF GROWING ONE ACRE OF RED KIDNEY BEANS AS RELATED TO YIELD AND OTHER FACTORS  
40 Farms, Cayuga and Seneca Counties and 37 Farms, Livingston and Wyoming Counties, New York, 1958

Cost to grow	Number of farms	Land cost	Value of all nutrients	Profit	Yield per acre (net cwt.)
<u>Cayuga-Seneca</u>					
Low - (\$45 - 54)	13	\$ 9.08	\$10.51	\$ 4.08	1,291
Medium - (55 - 60)	12	11.08	14.38	4.40	1,213
High - (61 - 82)	15	11.27	17.24	-17.57	1,118
<u>Livingston-Wyoming</u>					
Low - (\$41 - 65)	12	10.58	14.58	26.26	1,520
Medium - (67 - 80)	13	14.54	19.11	-11.35	1,275
High - (80 - 109)	12	17.58	26.48	- 5.94	1,669

Size of Enterprise

The number of acres of red kidney beans a grower produces has little to do with the yield he obtains. In Cayuga-Seneca the lowest yields were obtained by the small growers whereas in Livingston-Wyoming the large growers had the lowest yields (table 14).

It is interesting to note that on the average the smallest growers lost money in both areas. However, some growers in every size category lost money.

Apparently a grower with 30 acres of red kidney beans can achieve most of the economies of size that a grower with 80 acres can achieve. In Cayuga-Seneca growers with 10 to 29 acres had the highest costs, the lowest yields and the largest losses per acre. Growers in the four other size categories had comparable costs but obtained different yields. In Livingston-Wyoming the group of growers with the highest average yield did not have the largest profit because their costs were also the highest. The group having 70 to 89 acres had about average costs, the highest average yield and therefore the highest net profit.

Table 14. ACRES OF RED KIDNEY BEANS PRODUCED AS RELATED TO YIELD AND OTHER FACTORS  
40 Farms, Cayuga and Seneca Counties and 37 Farms, Livingston and Wyoming Counties, New York, 1958

Acres of beans	Number of farms	Total work units	Land cost	Growing cost	Net returns	Yield per acre
						(net wt.)
<u>Cayuga-Seneca</u>						
10 - 29	9	263	\$ 9.89	\$64.69	\$-26.19	989
30 - 49	9	433	10.44	57.27	6.58	1,263
50 - 69	9	408	10.56	57.50	10.14	1,267
70 - 89	5	481	10.60	57.65	4.49	1,203
90 or more	8	807	11.25	57.43	13.15	1,304
<u>Livingston-Wyoming</u>						
10 - 29	11	566	13.64	79.20	- 7.56	1,489
30 - 49	9	588	13.55	74.79	1.38	1,408
50 - 69	6	1,358	14.53	82.63	7.39	1,656
70 - 89	5	851	13.39	75.12	14.82	1,636
90 or more	6	1,797	16.83	64.40	8.08	1,292

Seed:

Most growers planted California seed so it was impossible to compare yields obtained from California seed with yields obtained from Idaho seed. All growers treated the seed before planting.

The rates of seeding ranged from 45 to 106 pounds per acre in both areas. Growers with the lowest seeding rates averaged about 60 pounds per acre; those with medium seeding rates averaged about 72 pounds, while growers with the highest seeding rates averaged about 87 pounds per acre. In both areas growers who planted 72 pounds per acre had higher yields than those who planted 60 pounds. The growers who averaged 87 pounds per acre had slightly lower yields.

It was not possible to draw any conclusions as to the effect of row spacing on yield. In Cayuga-Seneca growers with 36-inch rows had higher yields than growers with 30, 32, or 34-inch rows. In Livingston-Wyoming growers with 34-inch rows had the lowest yields while those with 36-inch rows had the highest yields. Growers with 30-inch rows had yields almost as high as those with 36-inch rows.