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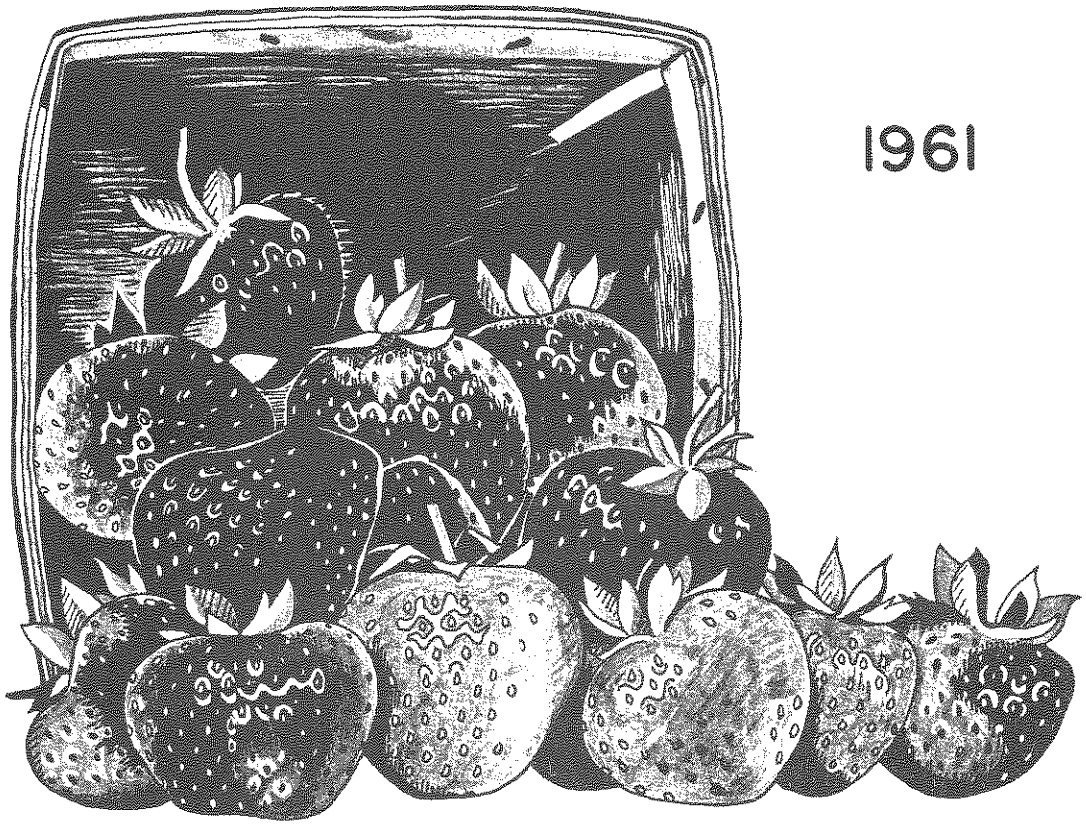
CAUSES OF VARIATION IN COSTS AND RETURNS IN THE PRODUCTION OF STRAWBERRIES

LONG ISLAND AND WESTERN NEW YORK



1961

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LOCATION AND DESCRIPTION OF THE FARMS STUDIED

Information for this study was obtained from 70 New York State growers who were surveyed just after the 1961 harvest season. Thirty of these were located in Suffolk County on Long Island and produced strawberries intensively on small acreages for the fresh market sale in New York City and Boston. The other 40 growers were located in the Erie-Chautuaqua Counties area of Western New York and produced this crop more extensively on much larger acreages. Twenty-nine per cent of their production went to processors.

Strawberries on Long Island were produced on light sandy soils as a side-line enterprise in connection with potatoes, cauliflower and other truck crops. In Western New York they were produced on good but somewhat heavier soils and in most cases were animportant part of a relatively large fruit and vegetable operation.

On Long Island the average grower had only 3 acres of bearing strawberries while the average Western New York grower had 18 acres. Ninety per cent of the Long Island growers, compared with only 38 per cent of the Western New York growers, had less than 5 acres of bearing strawberries.

ORGANIZATION OF THE STUDY

The survey method was used to collect data from the growers selected at random from grower lists furnished by County Agricultural Agents in Suffolk, Chautauqua and Erie Counties.

No upper limit was set on size of enterprise. However, names of all growers who harvested less than one acre of strawberries in 1960 were eliminated from the farms to be studied. The field enumeration was done for the 1961 crop year immediately after the harvest season which was the first week in July on Long Island and the third week in July in Western New York.

Because strawberry production is a two to three-year operation, it was divided into three separate parts for the purpose of analyzing costs and returns. All costs experienced from the beginning of the year until July 1 on newly planted beds were separated and called "starting" or "new bed costs". Growing and harvesting costs on these beds after July 1 and until the end of the picking season the following spring were called "costs on first-year fruiting beds". If beds were held over from the previous fruiting year, they were called "renovated beds" and costs of renovating and harvesting for the second fruiting year were kept separate. All costs of starting new beds were charged against the crop harvested in the first fruiting year since the decision to plow the bed under or hold it over for another fruiting year involves consideration of future rather than past inputs and returns on the part of most farmers. This is an important point. It may appear that the spread in returns between first- and second-year beds is too great. However, the chances of making money during the second year are influenced greatly by the quality of the first-year beds held over.

Detailed information relating to costs and returns on these farms has been published.[1] The purpose of this publication is to present information relating to the causes of variation in costs and returns in producing strawberries in New York State during the 1961 season.

AVERAGE COSTS AND RETURNS PER ACRE AND PER QUART

The total cost of producing strawberries from first year fruiting beds in Western New York in 1961 was $877 per acre or 32 cents per quart (table 1.). This included the cost of starting new beds, growing and harvesting. The returns were $682 from the sale of 3,023 quarts of berries sold at 22 cents per quart. On Long Island the total cost was $1,962 per acre or 37 cents per quart. The returns were $1,861 from 5,692 quarts of berries sold at 32 cents per quart.

Table 1. STRAWBERRY PRODUCTION COSTS, TOTAL RETURNS AND NET RETURNS ON FIRST-YEAR FRUITING BEDS
Long Island and Western New York Farms, 1961

Item	Western New York		Long Island	
Number of farms	40		30	
Acres bearing strawberries per farm	18		3	
Quarts sold per acre	3,023		5,692	
Returns per hour operator's labor	$-2.42		$1.10	
Costs:	Per Acre	Per Quart	Per Acre	Per Quart
Starting new beds	$ 278	11¢	$ 340	7¢
Growing	230	9	364	7
Harvesting	369	12	1,258	23
Total	$ 877	32¢	$1,962	37¢
Total returns	682	22	1,861	32
Net return	$-195	-10¢	$ -101	-5¢

Second year fruiting was practiced by about half the farmers. In Western New York, growing and harvesting cost was $337 per acre (table 2). The returns were $439 from the sale of 1,994 quarts of berries. On Long Island the cost was $690 per acre and the returns were $887 from the sale of 2,889 quarts of berries. There were marked differences in costs and returns as between Western New York and Long Island growers. The latter had smaller acreages and operated much more intensively. Their costs per acre were higher primarily because of higher yields and greater harvesting costs per unit of product. Their prices were somewhat more favorable relative to costs.

1/ Linton, R. E. and Dominick, B. A., Jr. "Costs and Returns in the Production of Strawberries, Long Island and Western New York, 1961," Department of Agr. Econ., A.E. Res. 84, Cornell Univ., Ithaca, N. Y., Jan., 1962.

Table 2. STRAWBERRY PRODUCTION COSTS, RETURNS, AND PROFITS ON SECOND-YEAR FRUITING BEDS
Long Island and Western New York Farms, 1961

Item	Western New York		Long Island	
Number of farms	22		15	
Quarts sold per acre	1,994		2,889	
Average return per hour operator's labor	$6.01		$6.57	
Costs:	Per acre	Per Quart	Per Acre	Per Quart
Renovation and growing	$ 95	6¢	$134	5¢
Harvesting	242	13	557	17
Total	$337	19¢	$691	22¢
Total returns	439	22	836	26
Net return	$102	3¢	$145	4¢

VARIATION IN COSTS AND RETURNS

Even though most farmers in New York did not make a gain on the first year fruiting crop, 11 of 40 farmers in Western New York and 12 of the 30 growers on Long Island did have positive net returns. There were wide ranges in costs of starting new beds, growing the crop and in harvesting. A study of these differences and the reasons for them can be a valuable guide to growers in their efforts to have more successful strawberry enterprises.

In Western New York, the costs of starting new beds ranged from $131 to almost $500 (table 3). Twelve of the 40 growers invested less than $225 per acre in starting new strawberry beds, while the costs on 5 farms were $375 or more. On Long Island costs ranged from $175 to $500 and on five farms the costs were $400 or more per acre.

Table 3. VARIATION IN PER-ACRE COSTS OF STARTING NEW STRAWBERRY BEDS
New York State, 1961

40 Farms, Western New York		30 Farms, Long Island	
Per acre	Number of farms	Per acre	Number of farms
Less than $225	12	Less than $250	4
$225 - 275	9	$250 - 300	5
275 - 325	7	300 - 350	9
325 - 375	7	350 - 400	7
375 and over	5	400 and over	5
Range $131 - $499	40	Range $175 - $500	30

Growing costs during the first fruiting year in Western New York varied from $54 to $362 per acre while on Long Island growers experienced a range from $207 to over $800 per acre (table 4). Harvest cost on a per-acre basis ranged from $140 to $821 in Western New York and from $562 to over $2,000 on Long Island. Growers in the Western part of the State experienced a range in net returns from a minus $680 per acre to a profit of $451 per acre. On Long Island the range was even greater, from a loss of over $1,000 to a profit of over $1,400 per acre.

Table 4. VARIATION IN PER-ACRE COSTS AND NET RETURNS ON STRAWBERRIES DURING THE FIRST FRUITING YEAR
New York State, 1961

40 Farms, Western New York			30 Farms, Long Island	
Per acre	Number of farms		Per acre	Number of farms
		Growing Cost		
Less than $175	10		Less than $275	7
175 - 225	8		275 - 325	6
225 - 275	15		325 - 375	7
275 - 325	3		375 - 425	6
$325 and over	4		$425 and over	4
Range $54 - $362	40		Range $207 - $1,002	30
		Harvest Cost		
Less than $300	13		Less than $900	6
300 - 350	8		900 - 1,100	5
350 - 400	6		1,100 - 1,300	8
400 - 450	3		1,300 - 1,500	3
450 and over	10		$1,500 and over	8
Range $140 - $821	40		Range $562 - $2,069	30
		Net Returns		
Less than $-500	5		Less than $-500	7
-500 to -100	19		-500 to 0	11
-100 to 300	14		0 to 500	7
$ 300 and over	2		$500 and over	5
Range $-680 to $451	40		Range $-1,092 to $1,404	30

Growers in both areas experienced less variation in growing and harvesting costs and net returns during the second fruiting year (table 5). Net returns in Western New York varied from a loss of $397 per acre to a profit of $483 per acre while on Long Island the greatest loss was $127 per acre and the greatest profit was $1,065 per acre.

Table 5. VARIATION IN PER-ACRE COSTS AND NET RETURNS ON STRAWBERRIES DURING THE SECOND FRUITING YEAR
New York State, 1961

40 Farms, Western New York			30 Farms, Long Island	
Per acre	Number of farms		Per acre	Number of farms
		Growing Cost		
Less than $50	7		Less than $75	2
50 - 75	5		75 - 125	5
75 - 100	6		125 - 175	4
$100 and over	4		$175 and over	4
Range $27 - $382	22		Range $64 - $198	15
		Harvest Cost		
Less than $175	8		Less than $200	5
175 - 225	4		200 - 400	3
225 - 275	2		400 - 600	1
275 - 325	1		600 - 800	2
$325 and over	7		$800 and over	4
Range $33 - $552	22		Range 0 to $1,366	15
		Net Returns		
Less than $-500	0		Less than $-500	0
-500 to -100	2		-500 to 0	3
-100 to 300	17		0 to 500	9
$ 300 and over	3		$ 500 and over	3
Range $-397 to $483	22		Range $-127 to $1,065	15

RELATIONSHIP OF SELECTED FACTORS TO NET RETURNS DURING THE FIRST FRUITING YEAR

Growing Costs Per Acre

Most of the Western New York growers who had high growing costs per acre found it impossible to make a profit. Of the one-third with the highest costs of starting new beds and growing the crop to harvest, not one farmer had a strawberry enterprise that showed a profit (table 6). On the other hand about half of the farmers with low costs had profitable enterprises.

The high-cost growers had smaller acreages, planted more plants per acre, applied more fertilizer, did more irrigating, but sold fewer berries per acre and received a lower price than did their more successful low-cost competitors.

Table 6. RELATION OF GROWING COSTS TO NET RETURNS ON FIRST-YEAR FRUITING BEDS
40 Farms, Western New York, 1961

Item	Costs of starting new beds and growing costs up to first fruiting		
	Low	Medium	High
Number of farms	13	14	13
Farmers making a profit	7	4	0
Acres of strawberries per farm	20	11	10
Quarts of berries sold per acre	3,132	3,243	2,675
Price per quart (cents)	24	22	21
Plants set per acre	6,203	6,810	7,286
Farmers irrigating berries	3	7	5
Times sprayed or dusted	2.3	1.5	1.4
Total pounds of nutrients applied per acre	219	220	337
Cost per acre:			
Starting bed	$ 201	$ 265	$ 363
Growing	159	249	279
Total growing	360	514	642
Harvesting	372	389	353
Total production cost	732	903	995
Total returns	761	719	564
Net return	$ 29	$-184	$-431

A similar relationship existed on the strawberry enterprises on Long Island although the much greater intensity of operation there resulted in higher costs and returns. Only four of the ten high-cost growers made a profit and on the average the group lost $168 per acre (table 7). These farmers sprayed and dusted more, did more irrigating and put on more fertilizer. Their yields were the highest of any of the groups and they received the highest average price per quart of berries. Even with higher yields and prices, their returns were not great enough to cover the extra costs.

By contrast the growers with the lowest costs farmed somewhat less intensively but still had good yields of berries and had returns per acre that exceeded costs by $109.

Harvesting Cost Per Quart

In Western New York, strawberry growers who had relatively low harvesting costs per quart had a few more acres of berries and considerably greater average yields per acre than did those with the highest average harvesting costs per quart (table 8). Compared with the low-cost growers, the group with harvesting costs per quart of 16 cents received six cents more per quart of berries but their average yield per acre was lower and their costs per acre higher and they lost considerably more money.

Table 7. RELATION OF GROWING COSTS TO NET RETURNS ON FIRST-YEAR FRUITING BEDS
30 Farms, Long Island, 1961

Item	Cost of starting new beds and growing costs up to first fruiting		
	Low	Medium	High
Number of farms	10	10	10
Farmers making a profit	5	3	4
Acres of strawberries per farm	2.2	2.6	2.3
Quarts of berries sold per acre	5,825	4,674	6,578
Price per quart (cents)	31	33	34
Plants set per acre	3,801	3,677	4,649
Farmers irrigating berries	8	10	10
Times sprayed or dusted	9	10	14
Total pounds of nutrients applied per acre	146	168	286
Cost per acre:			
Starting bed	$ 266	$ 326	$ 418
Growing	275	336	483
Total growing	541	672	901
Harvesting	1,169	1,119	1,485
Total production cost	1,719	1,791	2,386
Total returns	1,819	1,545	2,218
Net return	$ 109	$- 246	$- 168

Table 8. RELATION OF COST OF HARVESTING TO NET RETURNS ON FIRST-YEAR FRUITING BEDS
40 Farms, Western New York, 1961

Item	Cost per quart		
	Low	Medium	High
Number of farms	12	14	14
Average harvesting cost per quart (cents)	9	12	16
Acres of strawberries	15	15	11
Quarts of berries sold per acre	3,501	3,211	2,425
Price received per quart (cents)	22	21	28
Per acre:			
Growing cost	$ 475	$ 536	$ 508
Harvesting cost	331	374	397
Total production cost	806	910	905
Total returns	764	684	684
Net return	$ -42	$-226	$-291

On Long Island, harvesting costs were much higher than in Western New York but similar relationships existed. Growers with low costs per quart had larger acreages, lower costs per acre, higher yields and were much more successful financially (table 9). These farmers made an average gain of $306 per acre above all cash and non-cash costs as compared with an average loss of $676 for farmers having the highest harvesting costs per quart.

Table 9. RELATION OF COST OF HARVESTING TO NET RETURNS ON FIRST-YEAR FRUITING BEDS
30 Farms, Long Island, 1961

Item	Cost per quart		
	Low	Medium	High
Number of farms	11	11	8
Average harvesting cost per quart (cents)	18	21	29
Acres of strawberries	3.0	1.9	1.8
Quarts of berries sold per acre	6,643	5,337	4,813
Price received per quart (cents)	32	34	31
Per acre:			
Growing cost	$ 643	$ 693	$ 805
Harvesting cost	1,169	1,256	1,382
Total production cost	1,812	1,949	2,187
Total returns	2,118	1,855	1,511
Net return	$ 306	$ - 94	$ -676

Price Received Per Quart

Among the 40 Western New York strawberry growers studied there were only eight who had prices which were higher than 24 cents per quart (table 10). The highest average price received by any farmer was 39 cents. This group of farmers received an average price of 31 cents per quart, had an average of 16.5 acres of berries with a yield of 3,080 quarts per acre. Their average profit was $56 per acre.

At the same time there were 17 farmers whose prices were 20 cents or less per quart and averaged 18 cents per quart. These growers had an average of 9.9 acres of berries yielding an average of only 2,275 quarts per acre. The loss per acre for these farmers average $402. There was not one farmer among this group whose berries returned enough to cover all costs.

On Long Island, the farmers with the highest prices for strawberries received an average of 39 cents. They had 1.6 acres of berries per farm and sold 5,991 quarts per acre (table 11). Their costs per acre were high but with good production and prices they made a gain per acre which averaged $108. By contrast the farmers with low prices, averaging 24 cents per quart, had somewhat larger acreages, sold fewer berries per acre and lost an average of $322 per acre. Among this group of farmers were two whose cost of harvesting alone was higher than the returns from the berries. Also among this group there was not one farmer who showed a profit on his berries.

Table 10. RELATION OF PRICE RECEIVED TO NET RETURNS ON FIRST-YEAR FRUITING BEDS
40 Farms, Western New York, 1961

Item	Price received		
	High	Medium	Low
Number of farms	8	15	17
Average price per quart (cents)	31	22	18
Acres of strawberries per farm	16.5	16.3	9.9
Quarts of berries sold per acre	3,080	3,840	2,275
Per acre:			
Growing cost	$ 441	$ 511	$ 536
Harvesting cost	444	430	280
Total production cost	885	941	816
Total returns	941	848	414
Net return	$ 56	$ -93	$-402

Table 11. RELATION OF PRICE RECEIVED TO NET RETURNS ON FIRST-YEAR FRUITING BEDS
30 Farms, Long Island, 1961

Item	Price received		
	High	Medium	Low
Number of farms	8	10	12
Average price per quart (cents)	39	33	24
Acres of strawberries per farm	1.6	2.5	2.7
Quarts of berries sold per acre	5,991	5,639	5,519
Per acre:			
Growing cost	$. 792	$. 689	$. 659
Harvesting cost	1,426	1,232	1,167
Total production cost	2,218	1,921	1,826
Total returns	2,326	1,877	1,504
Net return	$ 108	$ - 44	$ -322

Size of Enterprise

Although there was some tendency for farmers with larger enterprises to be more successful the relationship was not consistent. In Western New York and on Long Island those farmers with large enterprises lost somewhat less than those with smaller bearing acreages (table 12).

Table 12. PRODUCTION COSTS, TOTAL RETURNS AND NET RETURNS IN PRODUCING ONE ACRE OF STRAWBERRIES THROUGH THE FIRST FRUITING YEAR, BY SIZE OF ENTERPRISE
70 Farms, New York State, 1961

Area and acres in bearing strawberries	Number of farms	Total production costs	Total returns	Net return
		Dollars per acre		
Western New York				
1.0 - 4.9	15	881	614	-267
5.0 - 24.9	16	864	676	-188
25.0 and over	9	895	808	- 87
Long Island				
1.0 - 2.4	14	2,130	1,839	-291
2.5 - 4.9	13	1,848	1,950	102
5.0 and over	3	1,676	1,573	-103

Yield Per Acre

Most farmers in Western New York at the prices received did not harvest enough berries to cover their costs and return a profit. There was, however, a very definite relationship between yields and profits (figure 1). Only two farmers with yields of less than 3,000 quarts sold per acre had a profit. Eight out of 19 with more than 3,000 quarts sold per acre had a profit.

On Long Island the variation in profits at the different yield levels was even greater and yet a relationship was evident when the data were plotted graphically.

Plants Set Per Acre

The number of plants set per acre had little influence on yield or profits in either area during 1961 (table 13). Profits were actually higher on Long Island and losses lower in Western New York on those enterprises where fewer plants were used.

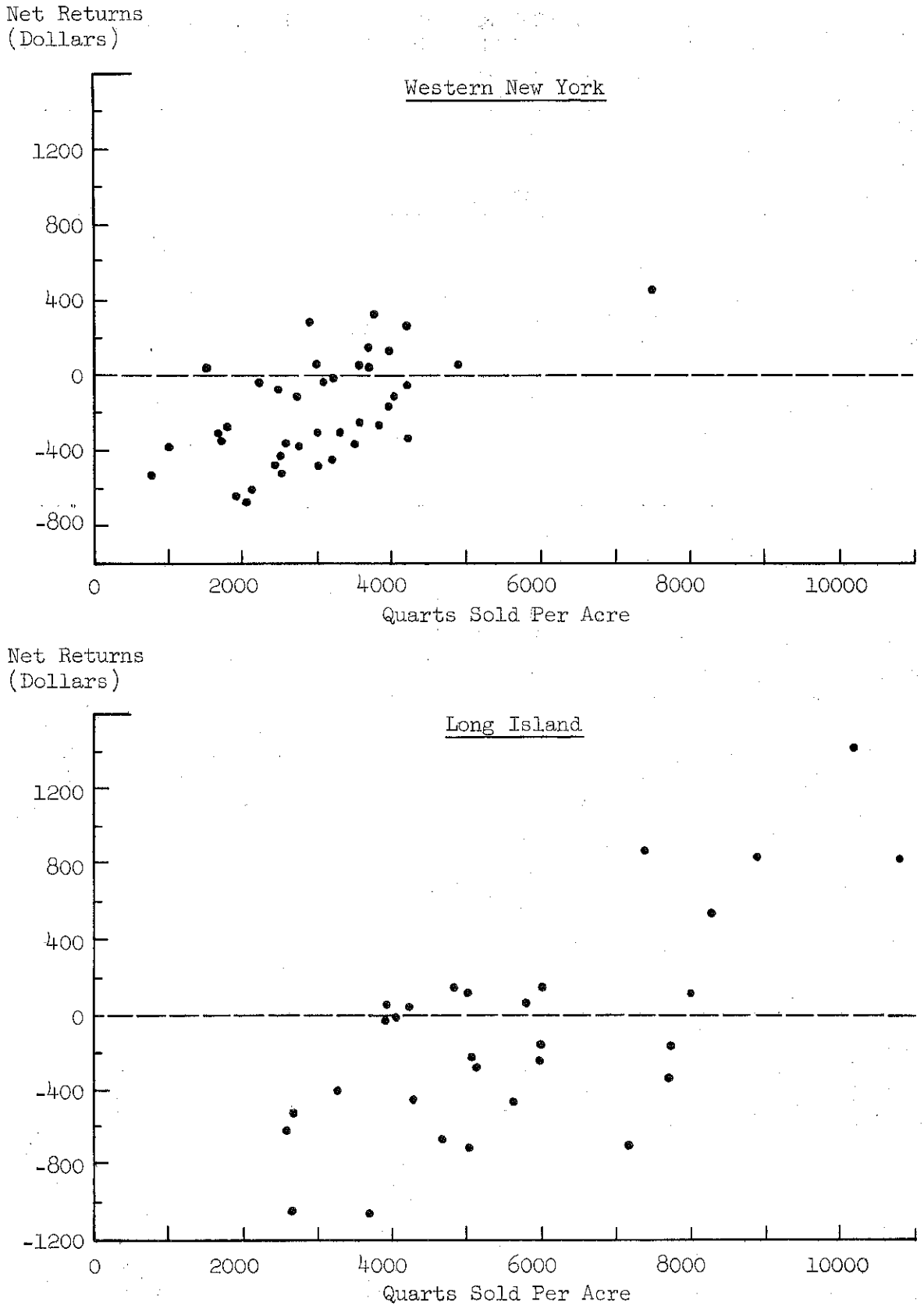

Figure 1. RELATION OF STRAWBERRY YIELD TO NET RETURNS DURING THE FIRST FRUITING YEAR, 1961

Table. 13. NUMBER OF PLANTS SET PER ACRE RELATED TO YIELDS AND NET RETURNS ON STRAWBERRIES IN THE FIRST FRUITING YEAR
70 Farms, New York State, 1961

Area and level of plants set per acre	Plants set per acre	Number of farms	Yield per acre	Net return per acre
	number		pounds	dollars
Western New York				
Low	5,261	13	3,020	-101
Medium	6,896	14	2,931	-218
High	8,135	13	3,124	-263
Long Island				
Low	2,922	10	5,992	128
Medium	3,908	10	5,110	-275
High	5,297	10	5,975	-158

RELATIONSHIP OF SELECTED FACTORS TO NET RETURNS DURING THE SECOND FRUITING YEAR

Growing Costs on Renovated Beds

In Western New York 22 of the 40 farms studied had some beds of strawberries which were renovated and carried over for a second year's fruiting. To study these, the 22 farms were divided into two groups of 11 each on the basis of cost of growing berries per acre including renovation (table 14). The farmers with low growing costs did not get as high a yield and therefore returns, but their costs of growing and harvesting were enough lower to be more profitable.

Table 14. RELATION OF GROWING COST TO NET RETURNS ON RENOVATED BEDS
22 Farms, Western New York, 1961

Item	Growing Cost	
	High	Low
Number of farms	11	11
Acres of renovated strawberries per farm	4.0	10.9
Quarts of strawberries sold per acre	2,215	1,834
Average price per quart (cents)	22	21
Per acre:		
Growing cost	$143	$ 99
Harvesting cost	271	214
Total production cost	414	260
Total returns	491	386
Net return	$ 77	$126

The same results were apparent on the 15 out of 30 Long Island farms where strawberry beds were carried over for a second year's fruiting (table 15). Yields were lower on farms with low growing costs but the costs of production were enough lower to more than offset the loss in income.

Table 15. RELATION OF GROWING COST TO NET RETURNS ON RENOVATED BEDS
14 Farms, Long Island, 1961

Item	Growing cost	
	High	Low
Number of farms	7	8
Acres of renovated strawberries per farm	1.9	1.9
Quarts of strawberries sold per acre	3,856	2,031
Average price per quart (cents)	30	30
Per acre:		
Growing cost	$ 175	$ 99
Harvesting cost	805	339
Total production cost	980	438
Total returns	1,161	647
Net return	$ 181	$ 209

Size of Enterprise

The larger strawberry growers in both areas tended to do more renovating and make greater profits per acre on the second-fruiting year berries than did those with small enterprises (table 16). Two small Long Island growers who had renovated beds and did not pick fruit from them because of low-quality berries and the lack of available picking labor at harvest time, lowered the profits for that group. The small growers in Western New York were the only group who lost money on second-year fruiting beds.

Yield Per Acre

As was previously noted with first-year fruiting strawberries there was a great deal of variation in net returns at different levels of yield during the second-fruiting year (figure 2). This was true for both Western New York and Long Island growers. In both areas net returns were greater with higher yields of berries.

Table 16. COSTS, TOTAL RETURNS AND NET RETURNS IN PRODUCING ONE ACRE OF STRAWBERRIES FOR THE SECOND FRUITING YEAR, BY SIZE OF ENTERPRISE
37 Farms, New York State, 1961

Area and acres in bearing strawberries	Number of farms	Total Production costs	Total returns	Net returns
			Dollars per acre	
Western New York				
1.0 - 4.9	6	484	424	-60
5.0 - 24.9	11	279	448	169
25.0 and over	5	290	436	146
Long Island				
1.0 - 2.4	5	527	561	34
2.5 - 4.9	7	819	1,088	270
5.0 and over	3	665	960	295

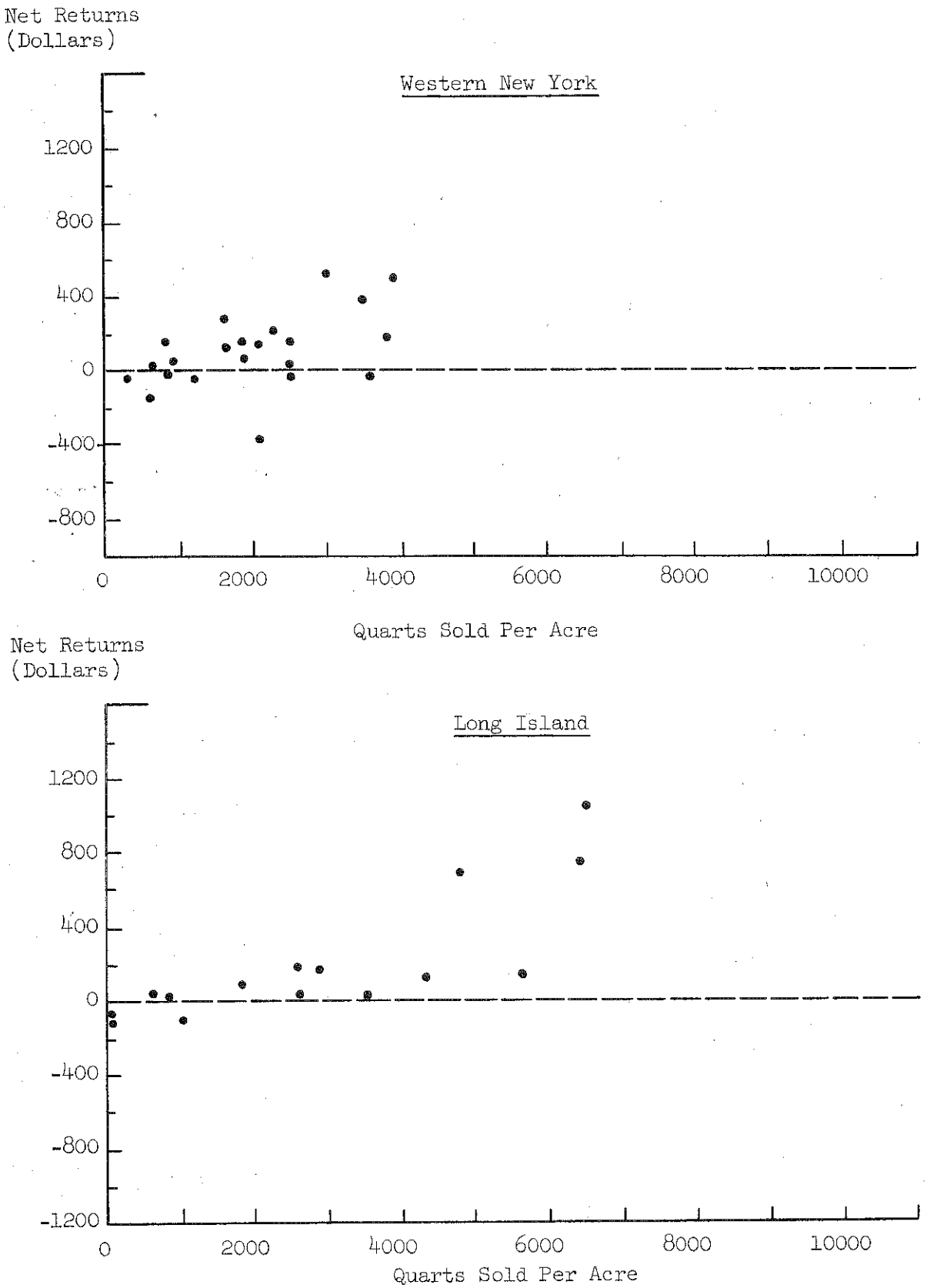

Figure 2. RELATION OF STRAWBERRY YIELD TO NET RETURNS DURING THE SECOND FRUITING YEAR, 1961

SUMMARY

Seventy growers in Western New York and on Long Island were surveyed concerning their inputs, costs and returns in producing strawberries during the 1961 season. Because the production is a two- to three-year operation, costs were separated into those for new beds, first-year fruiting beds and second-year fruiting beds. The purpose of this report is to present information relating to the causes of variation in costs and returns in producing this crop.

Average costs, yields and net returns from first-year fruiting beds varied widely in both areas. Growers on Long Island had smaller acreages and operated much more intensively. Their costs per acre were higher primarily because of higher yields and greater harvesting costs per unit of product. Their prices were somewhat more favorable in relation to costs. Growers in both areas experienced less variation in growing and harvesting costs during the second fruiting year. Generally, lower growing costs per acre were associated with higher net returns. On first-year fruiting beds, growers with the lowest costs actually had greater per-acre yields than the higher-cost producers. This was not true on second year fruiting beds.

Lower harvesting costs per quart were associated with smaller losses during the first fruiting year. Prices too were directly associated with net returns. Higher prices were also associated with higher yields and larger acreages on first-year fruiting beds.

The relationship between size of enterprise and net returns was not consistent. The larger growers in both areas, however, tended to do more renovating and make greater profits per acre than those with smaller enterprises.

The number of plants set per acre did not prove to be directly related to net profits during the 1961 season. One factor very closely associated with net returns per acre during both first- and second-year beds was the yield of saleable strawberries picked per acre.

Watching costs carefully and taking steps to obtain high yields of quality strawberries are basic to high returns in producing this crop. This is not to say that number of plants, rates of fertilization application and the many other factors involved in strawberry production are not important. However, it is to say that growers need to be aware of the relationships between the various factors and net returns and take positive action to assure high production per acre at reasonable costs for profitable strawberry production.