
MARKET GARDEN FARMS

**37 Years of Cost Accounts
3 Other Farms Analyzed**

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CONTENTS

	Page
Introduction	1,2
Non-income accounts	
Labor	2,6
Horses	6,7
Tractors	7,8
Bolen tractor	9
Trucks	9
Auto	9
Other equipment	10
Irrigation	10-12
Real estate	13
Operators' houses	13
Tenants' houses	13
Barns, other buildings	13,14
Drains	14
Cropland	15-17
Manure	17,21
Fertilizers	18-21
Lime	18,21
Cover crops	18,21
Containers	22,23
Marketing	22,24
Income accounts	
Relative importance	
Vegetables	25,26,28-30
Fruit	27,30,31
Hay and grain	27,30,31
Livestock	27,30,31
Crop yields	
From year to year	32
Over a period of years	32-37
Prices of farm products	
Vegetable prices over a period of years	38-41
Vegetable prices from year to year	41,44
Hay and grain prices	41-44
Livestock prices	42-44
Unit costs	
Vegetables	45-47,49
Hay and grain	48-50
Poultry	48,50
Profits	
Total per cost dollar	50-53
Per hour	51,54-59

CONTENTS (con'd)

	Page
Labor requirements	
Seasonal distribution	60-65
Hours per acre	65-71, 73
Accomplishment of labor	72-74
Accounts summarized	
Greenhouses, cold frames	75, 76
Sweet corn	76-78
Cauliflower	78-80
Cattle	81, 82
Farm analysis	
Market Garden Farm 2	83-87
Market Garden Farm 4	86, 88-94
Market Garden Farm 3	94-99
Capitol district	99-102
Rochester area	102-104
Labor incomes	104-106
Partnerships	106-109
Weights per unit	110, 111
Standards used in analysis	112

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manuscript and made many helpful suggestions.

COST ACCOUNTS ON A MARKET GARDEN FARM

FOR 37 YEARS

INTRODUCTION

For two generations the operators of this farm have studied agriculture at Cornell. It was nearly 40 years ago when the senior operator and his brother attended the winter courses. Carl Ladd, their instructor in farm management, was at that time securing farmers to co-operate with the college in keeping cost accounts. 1/

On his 300 acre farm, G. F. Warren had worked out a system of cost accounts, the purpose of which was to obtain a maximum amount of useful information with a minimum amount of bookkeeping. In 1912 his department, in co-operation with the United States Department of Agriculture, started accounts on eighteen farms. The next year Dr. Ladd obtained these young men as co-operators.

The procedure followed was to send a representative of the college to the farm to help take the inventory, set up the proper accounts in the ledger and labor books and explain to the farmer how the entries were to be made. The entries were entered directly to the account. There was no posting. Strips of gummed tape were fastened to the pages so that an account could be quickly found. At the close of the accounting year, a college representative again visited the farm, helped with the second inventory, checked the entries made by the farmer and obtained additional information necessary to close the books. The books were then taken to the college where they were closed and analyzed.

Since 1931 an annual report has been published. 2/ This was started by J. F. Harriott when he reported costs on 71 farms.

1/ The cost account work has been in charge of the following personnel:

1912-13	-	C. E. Ladd
1914	-	D. S. Fox
1915-17	-	W. I. Myers
1918-26	-	C. V. Noble
1927-32	-	J. F. Harriott
1933	-	P. J. Findlen
1934-41	-	P. S. Williamson
1942-46	-	H. F. DeGraff
1947	-	I. R. Bierly
1948-49	-	C. D. Kearl

2/ "Individual Factors and Annual Averages From Farm Cost Accounts, 47 Farms -- 1948", Department of Agricultural Economics, Cornell University, Ithaca, N. Y. - A. E. 709, November, 1949

On the Market Garden Farm, the accounts that were started in 1913 have been continued to the present time. This is the longest period that any co-operator has kept accounts with the college. Probably nowhere else is there available such complete cost records on a market garden farm over so many years.

The brother who did the marketing on the wholesale city market kept a record of the sales. His loads usually consisted of a number of vegetables packed in different containers and sold in small lots of various combinations to many buyers. This method of marketing made it difficult to record the sales for each vegetable.

The other brother kept the labor record. In his labor book each evening, he entered under each crop or account the number of hours that were spent on that crop or account. He also recorded the hours that the tractor and horses were used and the miles that the trucks and autos were driven.

At the end of the year, when the accounts were closed, all the costs for a crop appeared on one side of the ledger and on the opposite page were listed the credits or returns. Each crop and livestock account (other than horses) was balanced to show how much was gained or lost. On the Market Garden Farm there were about thirty of these crop and livestock accounts.

About thirty other accounts were kept which were of convenience in assembling costs. At the end of the year, these accounts were closed by transferring the costs either directly or indirectly to the crop and livestock accounts. These accounts were not balanced to show a loss or a gain and are here referred to as non-income accounts.

NON-INCOME ACCOUNTS

Labor

Included as a cost in the labor account is the value of the operator's time. This was estimated at what it would cost to hire someone to take the operator's place. Two brothers were the operators until 1929. Their farm consisted of 108 acres, 85 acres of which were cropped.

In 1929 they divided the farm. Each brother had an equal acreage of the two best grades of land. The brother who kept the farmstead also had the pasture and all of the poorer land. This gave one brother 28 acres and the other 60 acres of cropland. The brother with the smaller farm kept cost accounts until 1940. On the other farm, cost accounts have been continued to the present time, and these are summarized in this report.

In 1941 there were three operators. Two sons who had finished the two-year course at Cornell now became partners with their father. They increased their operations by renting 24 to 50 acres of cropland.

In 1944 an opportunity came to buy an adjoining farm of 70 acres. The deed to this farm was made out to the eldest son.

The third son served in the Army during the war and finished the four-year course at Cornell in 1948. He now makes the fourth partner.

TABLE 1: ANNUAL COST OF NON-INCOME ACCOUNTS, 1941-48
Market Garden Farm

Non-income accounts	Average cost per year			Percent of total
	Total	Duplicated in non-income accounts*	Net charge to income accounts	
<u>Real estate</u>				
Operators' houses	\$1,247	\$487	\$ 760	
Tenants' houses	283	239	144	
Greenhouses	385		385	
Other buildings	1,219	269	950	
Water system	130	65	65	
Tile drains	278		278	
Cropland	1,684		1,684	
Total			\$4,166	13.5
<u>Power and equipment</u>				
Horses	917	9	908	
Tractors	838	10	828	
Trucks	1,316	11	1,305	
Autos	960	9	951	
Irrigation	1,863		1,863	
Other equipment	1,381	40	1,341	
Total			\$7,196	23.2
<u>Labor</u>	21,038	1,424	19,614	63.3
Total of above costs			\$30,976	100.0

* The costs given in this column have been transferred to accounts listed in this table and are thus entered twice. For example, \$487 per year was charged to labor for houses used by operators.

From time to time, on a market garden farm, a number of workers are needed to help with the hand work such as weeding, transplanting, picking, bunching, etc. Women of Polish and Italian descent living nearby did this work. During World War II Jamacians were also available.

Not all of the labor cost was charged directly to the income accounts. For example, labor doing horse chores was charged to horses and from the horse account was distributed to the income accounts according to the hours worked. Over three-fourths of the labor, however, was charged directly to income-producing accounts.

Labor was the largest item of expense on the Market Garden Farm. For the past eight years, during 1941-48, labor costs were about three times as large as the annual cost for tractors, trucks, horses, and equipment, and approximately five times as large as the real estate costs which include land and school taxes, upkeep of buildings, interest on the value of land and buildings, etc. (table 1).

TABLE 2: NET ANNUAL COST OF BUILDINGS, LAND,
EQUIPMENT, AND LABOR, 1914-48
Market Garden Farm

Non-income accounts	Average cost per year to income accounts			
	1914-28	1929-34	1935-40	1941-48
Buildings other than dwellings	\$ 637	\$ 828	\$ 756	\$ 1,335
Cropland, including drains	1,199	904	781	1,962
Power and equipment				
Horses	975	447	500	908
Tractors	342*	142	212	828
Trucks	974	601	469	1,305
Other equipment	594	368	411	1,341
Labor	5,547	3,567	5,270	19,614
Total	\$10,144	\$ 6,857	\$ 8,399	\$27,293
Hours of labor	13,793	10,247	18,442	28,606
Cost per hour of labor	Cents	Cents	Cents	Cents
Labor	40.2	34.8	28.6	68.6
Buildings other than dwellings	4.6	8.1	4.1	4.7
Cropland, including drains	8.7	8.8	4.2	6.8
Horses	7.1	4.3	2.7	3.2
Tractors	2.4*	1.4	1.2	2.9
Trucks	7.1	5.9	2.5	4.5
Other equipment	4.3	3.6	2.2	4.7
Total	73.5	66.9	45.5	95.4

* Tractor purchased in 1920. Average annual tractor cost: 1920-28; \$341
1914-28; \$218

Labor costs have been rising more rapidly than other costs as shown by the 1935-40 and 1941-48 averages. Since 1941 additional land has been worked and the hours were increased 55 per cent. The cost per hour has increased from 29 to 69 cents, while the hours per worker per year have declined (figure 1). Thus, the annual net cost for all labor increased from \$5,270 to \$19,614, an increase of 272 per cent (table 2). At the same time, the annual cost of power and equipment increased from \$1,592 to \$4,382, an increase of 175 per cent; and buildings (other than dwellings) and cropland from \$1,537 to \$3,297, an increase of 114 per cent.

The labor used on this farm, if reduced to the equivalent of year-men, averaged 5.2 men when the brothers were in partnership, 3.4 men during the first six years and 6.1 men during the last six years that the brother farmed alone, and 10.6 men since the sons became partners in the business (table 3).

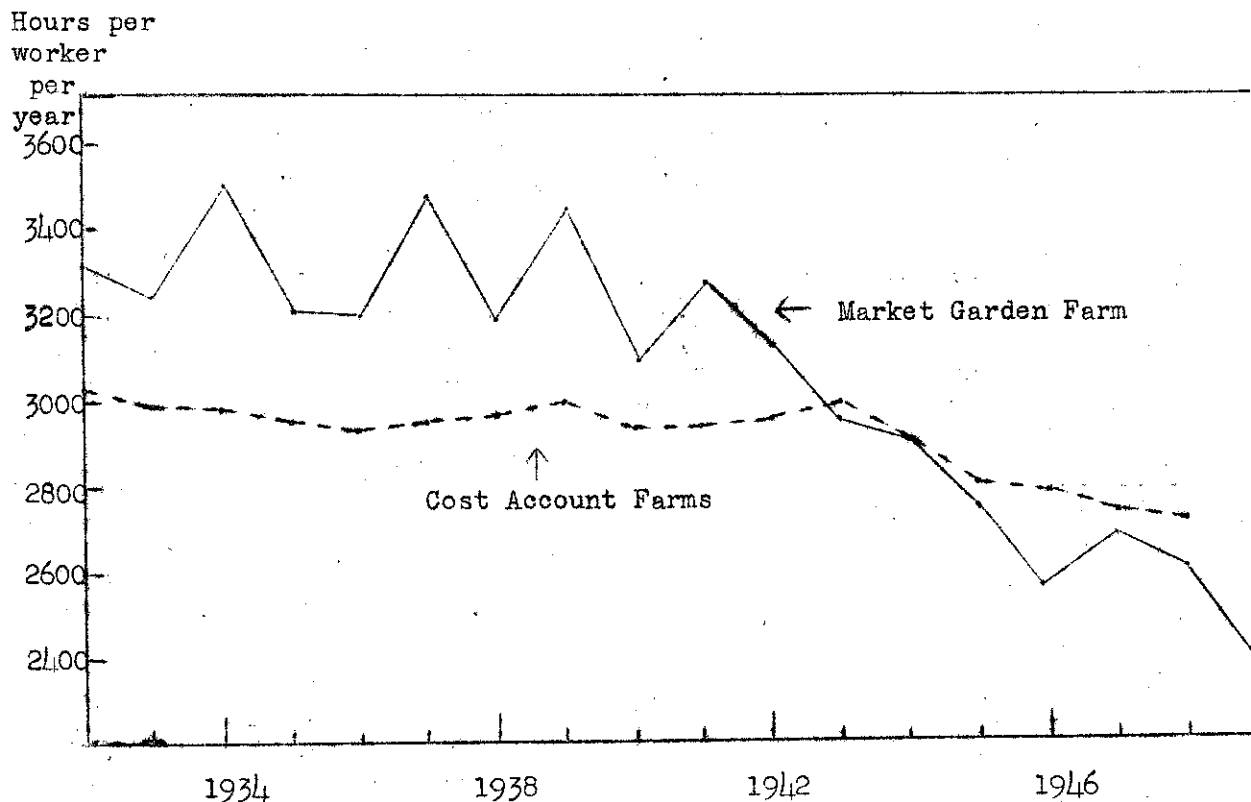


Figure 1.—HOURS PER MAN-EQUIVALENT; MARKET GARDEN FARM AND AVERAGE OF ALL COST ACCOUNT FARMS, 1932-48

The cost account records show that the farmer and his help are now working fewer hours than they did.

Since 1941, on the Market Garden Farm, the hours per man-equivalent have declined 27 per cent. This amounts to a shortening of the work day from two to three hours.

The average hours per man-equivalent for all cost account farms have shown a decline each year since 1943. The decline for the six years amounts to 9 per cent or the shortening of the work day by about one hour.

TABLE 3: ANNUAL COST AND COST PER HOUR FOR
LABOR, HORSES, TRACTORS, AND TRUCKS, 1914-48
Market Garden Farm

Item	Average per year			
	1914-28	1929-34	1935-40	1941-48
<u>Labor</u>				
Man equivalent	5.17	3.35	6.12	10.65
Total hours worked	15,201	11,219	19,958	30,696
Total cost	\$6,130	\$3,917	\$5,709	\$21,038
Cost per hour	\$0.40	\$0.35	\$0.29	\$0.69
Hours per man	2,940	3,349	3,261	2,882
<u>Horses</u>				
Number of horses	8 to 4	3	3 to 4	3 to 4
Total hours	3,523	1,872	2,330	1,929
Total cost	\$1,006	\$468	\$503	\$917
Cost per hour	\$0.29	\$0.25	\$0.22	\$0.48
Hours per horse	687	661	666	406
<u>Tractors</u>				
Number of tractors	1	1	1	1,3
Total hours	337*	261	395	1,218
Total cost	\$367	\$147	\$213	\$838
Cost per hour	\$1.09**	\$0.56	\$0.54	\$0.69
<u>Trucks</u>				
Number of trucks	1,3	2	1,2	2,3
Total miles	6,763	5,297	6,285	13,277
Total cost	\$983	\$611	\$476	\$1,316
Cost per mile	\$0.145	\$0.115	\$0.076	\$0.099
<u>Per 100 hours of man labor</u>				
Horse hours	23	17	12	6
Tractor hours	2.2*	2.3	2.0	4.0
Truck miles	44	47	31	43

* 1920-28

** Cost per hour for tractor and tractor tools.

Horses

The gas engine has largely taken the place of horses. In 1913, on the Market Garden Farm, eight horses and a truck furnished the power. In 1920 a tractor was purchased and work horses were reduced to four. The last two horses were sold in 1949.

Before the tractor was purchased, this farmer used 31 hours of horse work for every 100 hours of labor. In 1948 the ratio was 4 to 100. Relative to labor, horse work had been reduced 87 per cent.

TABLE 4: INVENTORY VALUES OF REAL ESTATE,
POWER, AND EQUIPMENT, 1914-48
Market Garden Farm

Account	1914-28	1929-34	1935-40	1941-48
<u>Average inventory values</u>				
Real estate				
Operators' houses	\$ 3,605	\$ 2,493	\$ 2,017	\$12,762
Tenants' houses	998	989	879	1,729
Other buildings	6,772	6,912	7,081	10,589
Cropland, Drains	14,276	11,610	11,643	17,871
Power and equipment				
Horses	800	286	376	365
Bolen tractor		53	18	215
Other tractors	306	98	318	1,486
Trucks	1,502	950	555	1,941
Autos, total	507	200	519	1,261
Irrigation			1,967	4,569
Other equipment	1,792	800	932	2,847
<u>Annual cost in per cent of value</u>				
Buildings	12%	14%	14%	12%
Irrigation			36	41
Power, other equipment	56	66	63	58

Tractors

The tractor and tractor tools were included in one account until 1929 when Dr. Harriott, at the request of the farmers, kept the tractor account separate.

The tractor purchased on this farm in 1920 was a Fordson and cost \$875 plus \$282 for plow and disk. This tractor and a second-hand one purchased in 1931 for \$35 did the tractor work for 18 years. During the 18-year period, the tractor was used an average of 309 hours a year at a cost of \$259 or 84 cents per tractor hour.

At this time, most of the draft work was done by horses. They worked 2,375 hours per year or an average of 669 hours per horse. It cost this farmer \$190 to keep a horse for a year or 28 cents for each hour of horse work. The hour cost was about the same for a tractor

as for a three-horse team.

But the tractor had the advantage in speed, endurance and power. Besides, the tractor did not have to be fed and watered two or three times daily. On the Market Garden Farm, the time spent on horse chores during the 18 years was equivalent to one full-time man working two and one-half years. It is easier to go for the tractor than to groom, harness and hitch up a team. Like humans, horses have ideas, and they sometimes conflict with those of the driver.

For these reasons, more of the work was done by the tractor and, during the season of 1942, the rubber-tired Fordson, purchased in 1938 for \$900, was used 848 hours. Because of the low depreciation charge on this five-year-old tractor and the large number of hours used, the cost per hour in 1942 was only 39 cents. This was only six cents more than the cost of a horse-hour.

But this low cost was not to continue. To become fully mechanized, this farmer bought several tractors at boom prices. As a result, the hours that each tractor was used have declined. In 1948 the three tractors on this farm were used a total of 1,640 hours at a cost of \$1,320.

For the season of 1950 the farm is equipped with four tractors (table 5). These represent six times the investment that the Fordson did in 1920. Based on past experiences, his 1950 tractor costs may exceed \$2,000 (table 4).

TABLE 5: TRACTORS, JANUARY 1, 1950
Market Garden Farm

Make	Size	Year bought	Cost	Inventory value Jan. 1, 1950
New Ford	2 plow	1947	\$1,210	\$ 970
Farmall M	3 plow	1948	1,900	1,540
Allis Chalmers G	1 plow	1948	851	743
Farmall Super A	1 plow	1949	1,425	1,282
			\$5,386	\$4,535

Each tractor is fitted to do some kinds of work better than the others. The Farmall M is adapted for rugged work. It can pull a 3-gang plow and handle the manure loader. The manure spreader is hitched to the New Ford or Farmall Super A, and so are the cultivators. On the Farmall Super A, a weed control sprayer fits the attachments used for the cultivator. The pulley on the tractor is connected to a pump which draws water from a tank on the draw-bar. It is equipped with 12 nozzles and sprays four rows of corn at a time.

Bolen Tractor

A separate account was kept with the Bolen, a small tractor used for seeding and cultivating. The first Bolen, purchased in 1927, with tools, cost \$237 and was used for 15 years. A new Bolen, purchased in 1941, with drill and cultivator, cost \$348. The Bolen tractor has been used about 60 hours a year at a cost of \$40.

Trucks

A market gardener, 15 miles from market, probably looks upon his truck as his No. 1 investment. When the accounts were started in 1913, the brothers owned a Federal truck that they inventoried at \$1,800. This truck was sold in 1916 for \$675 and a new one purchased for \$1,600. Although another truck was purchased in 10 years, this 1916 truck was used for 17 years.

When the business was divided in 1929, it was necessary to buy another truck which cost \$1,685. When this truck was 12 years old, a new one was purchased for \$1,216. A third truck was purchased in 1945, a 2-3 ton Federal, for \$2,517. Since 1945 three trucks have been used.

Besides the federal trucks, a Buick car in 1923 and another in 1932 were converted to trucks and used on the farm.

Until 1941 the truck miles per season averaged about 6,000. It cost this farmer about as much to maintain his trucks as to keep his horses. From 1914-28 the annual cost for each averaged about \$1,000. From 1935 to 1940, these costs had been reduced to around \$500. The cost per truck mile declined from 14.5 cents to 7.6 cents (table 3).

Since 1941 the trucks have been driven more and costs have increased. In 1948 the three trucks were driven 21,354 miles at a cost of \$1,885 or 8.8 cents per mile. This was at the rate of 74 miles for each 100 hours of labor used on the farm. Prior to 1941, the ratio was 41 miles to 100 hours. Increasing the number of operators and number of trucks has increased the total truck mileage.

Autos

In the early years, the auto on this farm was largely for personal use and pleasure. Until 1938, the cost of the car was often entirely charged to personal and when a share was charged to the farm, it seldom amounted to as much as \$100 for the year. Since 1938 the cars have been increasingly used for business. By 1940, \$406 of the car expense was charged to business and only \$122 to personal. In 1948 three autos were owned by the operators and the cost during the year was about the same for the three autos as for the three trucks. In that year, 70 per cent of the cost of the autos or \$1,282 was charged to the farm and \$539 to personal.

Other Equipment

The rest of the equipment was carried in one account. Until 1935 the cost of this equipment was distributed to the crop and livestock accounts in proportion to the hours that horses worked on each enterprise.

Mechanization made this method obsolete. In 1936, P. S. Williamson ingeniously developed a method of distributing the costs by classifying the equipment according to use. For example, in 1948 the greenhouse equipment cost \$366 and was charged to the greenhouse account; the manure equipment cost \$219 and was charged to the manure account; the duster cost \$94 and was charged to greenhouses, cauliflower, cabbage, etc., according to the hours used. In all, 13 such classifications of equipment were made on this farm.

In 1948 the total cost for power and equipment amounted to \$11,501, a 60 per cent increase over the 1941-48 average of \$7,196 (table 1). This large increase has taken place without a corresponding increase in the size of the business as measured by hours of labor. The cost of power and equipment per hour of labor increased from 25 cents to 40 cents. The operators must be somewhat disturbed by such rapid increases in cost at a time when the prices of farm products are beginning to decline.

Irrigation

Irrigation was first practiced on this farm in 1934. In that year, \$450 was invested in a well, Kronenberg pump, and fittings, and eight acres were irrigated. The next year an electric motor, oscillators, and pipes and fittings increased the investment to \$900, and 23 acres were irrigated (table 6). The third year a turbine pump was purchased for \$475 and an additional \$1,500 was invested in pipes and fittings. By 1939, the irrigation system was inventoried at \$3,000. This investment was doubled when a system was installed on the son's farm.

The irrigation system in January, 1950 was inventoried at \$7,337. Interest on the investment, depreciation, parts, and repairs now accounted for more than two-thirds of the irrigation cost.

One of the items of cost has been "dry holes", two in 1945 which cost \$735 and one in 1948 costing \$300.

About two-thirds of the water used for irrigation is pumped from deep wells using turbine pumps. The water is distributed by the overhead Skinner system. The main lines are permanent, and the distributing pipes portable. Sufficient distribution pipes are available to care for at least six acres, but usually, about three acres are irrigated at one time.

Irrigation is generally used as a crop reaches maturity. In a drought period, tomatoes are irrigated at blossom time and, if the drought continues, about an inch of water is applied once a week.

TABLE 6: IRRIGATION COSTS, 1934-49
Market Garden Farm

Year	Labor hours	Labor cost	Elec- tricity	Wells, pumps, motors, etc.	Interest on inventory value	Inventory at end of year	Charged to crops	Acres irrigated*	Irrigation cost per acre irrigated
1934	278	\$ 85	\$ 10**	\$ 489	\$ 11	\$ 450	\$ 145	8	\$18
1935	90	27	23	497	34	900	131	23	6
1936	830	232	106	2,153	85	2,500	976	53	18
1937	342	101	85	116	125	2,500	427	30	14
1938	526	163	132	22	124	2,450	491	37	13
1939	1,764	456	170	1,170	136	3,000	1,382	59	23
1940	566	183	119	385	150	3,000	837	43	20
1941	1,029	391	176	636	160	3,400	963	65	15
1942	624	301	175	114	170	3,400	790	58	14
1943	530	313	169	210	170	3,400	862	43	20
1944	951	649	275	1,323	190	4,200	1,637	77	21
1945	925	675	283	3,156	255	6,000	2,569	73	35
1946	925	772	395	1,294	305	6,200	2,566	82	31
1947	770	712	251	1,433	329	6,950	1,975	77	26
1948	728	765	304	1,864	341	6,680	3,514	76	46
1949	1,179	1,274	331	2,221	350	7,337	3,519	97	36

* All of the acreage given may not have been irrigated. In recent years a charge was made if the field was situated so that it could be irrigated even if no water was applied.

** Gas engine was used in 1934.

The cost of irrigation is charged to all land that can be reached, whether watered or not. But some crops are charged more than others because more water is usually applied. For example, celery which cannot be raised without irrigation has been charged four times as much per acre as sweet corn which is seldom irrigated. Other crops besides celery rated 4 are: tomatoes, broccoli, parsley, and cucumbers (table 7).

TABLE 7: ACCOUNT WITH IRRIGATION, 1949
Market Garden Farm

Debit		Credit			
Beginning inventory	\$ 6,680.00	End inventory		\$ 7,337.00	
		Crop	Acres	Weight	
Feb. 10, galvanized pipe	151.20	Endive	1.0	3	37.16
Mar. 25, leather tees	34.75	Cabbage	11.9	3	442.25
Apr. 26, ells, tees, etc.	29.53	Tomatoes	11.3	4	559.94
May 1, 1 Pomona pump		E. Cauli-			
and motor	1,256.14	flower	6.8	3	252.72
May 18, 588' pipe	187.28	Mustard &			
repair motor	54.82	turnip			
July 10, brushes - motor	30.00	greens	2.25	3	83.62
July 25, oscillator	40.40	L. Cauli-			
Aug. 14, 6 days' labor	240.00	flower	5.0	3	185.82
unions, nipples	36.75	Melons	9.0	3	334.48
bushings, etc.	27.40	Beets	0.5	3	18.58
tees, gaskets,		Broccoli	1.0	4	49.55
parts	118.31	Snap beans	3.0	3	111.49
Electricity	331.05	Chard	0.5	3	18.58
Interest	350.42	Celery	4.65	4	230.42
1 gallon pump oil	.45	Parsley	0.6	4	29.73
		Other			
1,179 man hours	1,273.75	lettuce	0.8	3	29.73
2 tractor hours	1.50	Iceberg			
300 auto miles	12.70	lettuce	5.25	3	195.12
		Spinach	7.1	3	263.87
		Cucumbers	3.0	4	148.66
		Squash	2.5	1	30.97
		Peppers	8.7	3	323.33
		Sweet corn	10.0	1	123.88
		Eggplant	0.0	2	--
		Straw-			
		berries	2.0	2	49.55
	\$10,856.45				\$10,856.45

Real Estate

From 1913 to 1919 expenses pertaining to the farm, such as taxes, fire insurance, building material, as well as interest on the value of the farm, were entered in the account called farm or real estate. At the end of the year, it involved considerable work to distribute these heterogeneous costs to their proper accounts.

In 1920 C. V. Noble simplified the task by splitting this account into a number of accounts, including operator's house, tenant house, other buildings, cropland, etc.

Operators' Houses

From 1914 to 1942 the inventory value of the operators' house averaged \$2,356. The cost of maintaining the house, including interest, amounted to \$327 per year which was 14 per cent of the inventory value of the house.

In 1942 the house was remodeled and \$2,655 was spent for material, \$2,546 for carpenters, \$1,152 for plumbing, and another \$1,000 for wiring, heating plant, etc. The inventory value of the house was now increased from \$1,800 to \$9,500, and the annual cost to \$755..

In estimating the value of his time, the operator considered the wages paid farm managers. Farm managers, in addition to wages, usually have the use of a house and other privileges. It has been the practice on the cost account farms to include as a labor charge the cost of the operator's house if it did not exceed \$300 per year. Any cost above \$300 was not included as a farm expense but was charged to personal. This limitation will probably be increased this year, a change somewhat overdue.

On January 1, 1950 the house was valued at \$8,000 and the son's house on the newly purchased farm at \$8,400. The annual cost for the two houses for 1948 amounted to \$1,810. Labor was charged \$600, hens \$40 for a place to pack eggs, and the balance was charged to personal.

Tenants' Houses

There are two tenant houses now on the farm; one inventoried at \$800 and the other at \$1,700. The annual cost in 1948 was \$447 which was charged to labor. In some years, when the tenant house was rented, the account was balanced to show a gain or loss.

Barns and Other Buildings

Until the purchase of the son's farm, the total value of barns and greenhouses as inventoried did not vary greatly from the thirty-year average of \$6,892. The annual cost for the use of these buildings amounted to \$899 which was 13 per cent of their inventory value.

The two greenhouses that were on the farm when the brothers started farming are gone. Two new greenhouses have been built, one in 1933 and another in 1942. The greenhouses are 25' x 100' and cost about \$2,000 each.

In 1936 a concrete stave silo, 14' x 30', was added at a cost of \$480.

During 1948 and 1949, \$3,000 was spent on the horse barn. The barn now has a packing room for vegetables and a storage space for packages besides a place for trucks, tractors, and tractor tools.

During the partnership, from 1914-28, the investment in barns and other buildings per hour of labor amounted to 45 cents. This investment was increased when the brothers divided the farm and built another set of buildings. For the first six years of operation, the brother who kept the farmstead and worked 28 fewer acres of cropland had an investment in buildings of 62 cents per hour of labor. The lowest investment, 24 cents, occurred during 1941-43. Renting cropland during these years increased the hours of labor without increasing the investment in buildings. However, after the purchase of the son's farm, the building investment was increased to 41 cents per hour of labor.

The buildings inventoried as of January 1, 1950 were as follows:

Cow barn	\$ 3,100
Son's barn	2,825
Packing house, tool barn	4,000
Greenhouses	
Built in 1933	1,550
Built in 1942	1,675
No. 1, son's farm	650
No. 2, son's farm	525
Garages, two	550
Silo, 14' x 30'	300
Pickers' shanty	225
	<hr/>
	\$15,400

Drains

In 1914 the brothers spent over \$2,200 draining 32 acres of cropland. A traction ditcher dug 46,933 feet of ditch. The 3" tile, 1 foot in length, cost 1 2/3 cents. This expense was entered in the real estate account and was carried as an improvement, for the value of the 32 acres was increased from \$45 to \$125 per acre.

In 1921 a separate account was kept with drains. The drains have been inventoried, on an average, at \$2,738 and the annual cost has amounted to \$273. Included in the cost is a depreciation charge of 3% on the inventory value of drains at the beginning of the year.

Unless otherwise stated, the value of the drains is included in the value of cropland.

Cropland

Only once has the inventory value of cropland been changed to keep inventory values in line with market values. This happened in 1922 when the value was dropped from \$170 to \$139 per acre. This decrease of \$2,500 was not included in the charge for use of land. The 64.5 acres of cropland purchased in 1944 were valued at \$169 per acre.

For accounting purposes, the land was classified into three grades. Ten acres of the best land nearest the farmstead was valued at \$300 per acre. The rest of the cropland was divided into two grades; 57 acres were valued at \$200 per acre and 59 acres at \$87.

On the home farm, the 29 acres north of the road were mapped as Chenango shale loam. 1/ This soil is characterized by quantities of angular fragments of shale scattered over the surface and embedded in the sub-soil. Large quantities of loam and organic matter are in the surface soil and it is very productive. The surface is undulating or gently rolling and at a depth ranging from 20 to 40 inches are stratified beds of gravel and sand. It is a warm, early soil, well-drained, and especially suitable for vegetables.

The 32 acres of cropland on the south side of the road were mapped as Newton silt loam. The surface soil is a loamy, dark gray silt loam high in organic matter. It grades into mottled gray, yellow, and brown silt loam which becomes more compact with increasing depth. It rests at 20 to 30 inches on fine sandy loam material underlain by stratified beds of sand and gravel. If drained, it is a fairly good soil for truck crops.

The son's farm is mapped as Caneadea silt loam although close to the road is a strip of Chenango shale loam. The surface soil of the Caneadea silt loam is light-colored and low in organic matter. Like the surface soil, the upper subsoil layer is a friable silt loam, but the lower subsoil is a heavy-textured silty clay loam. Drainage is generally poor. In this area, the soil is used largely for truck crops.

The farm is situated 810 feet above sea level. This is 237 feet higher than Lake Erie, which is 5 miles away. The air drainage is good. The cold air moves down the slope and furnishes immunity from frosts in early spring and late fall.

The primary costs of cropland are interest, taxes, and labor. Labor charged to cropland includes such work as cleaning ditches, cutting brush and weeds, and picking stone.

1/ "Soil Survey of Erie County, New York," United States Department of Agriculture, Bureau of Chemistry and Soils in co-operation with the Cornell University Agricultural Experiment Station, Series 1929, Number 14.

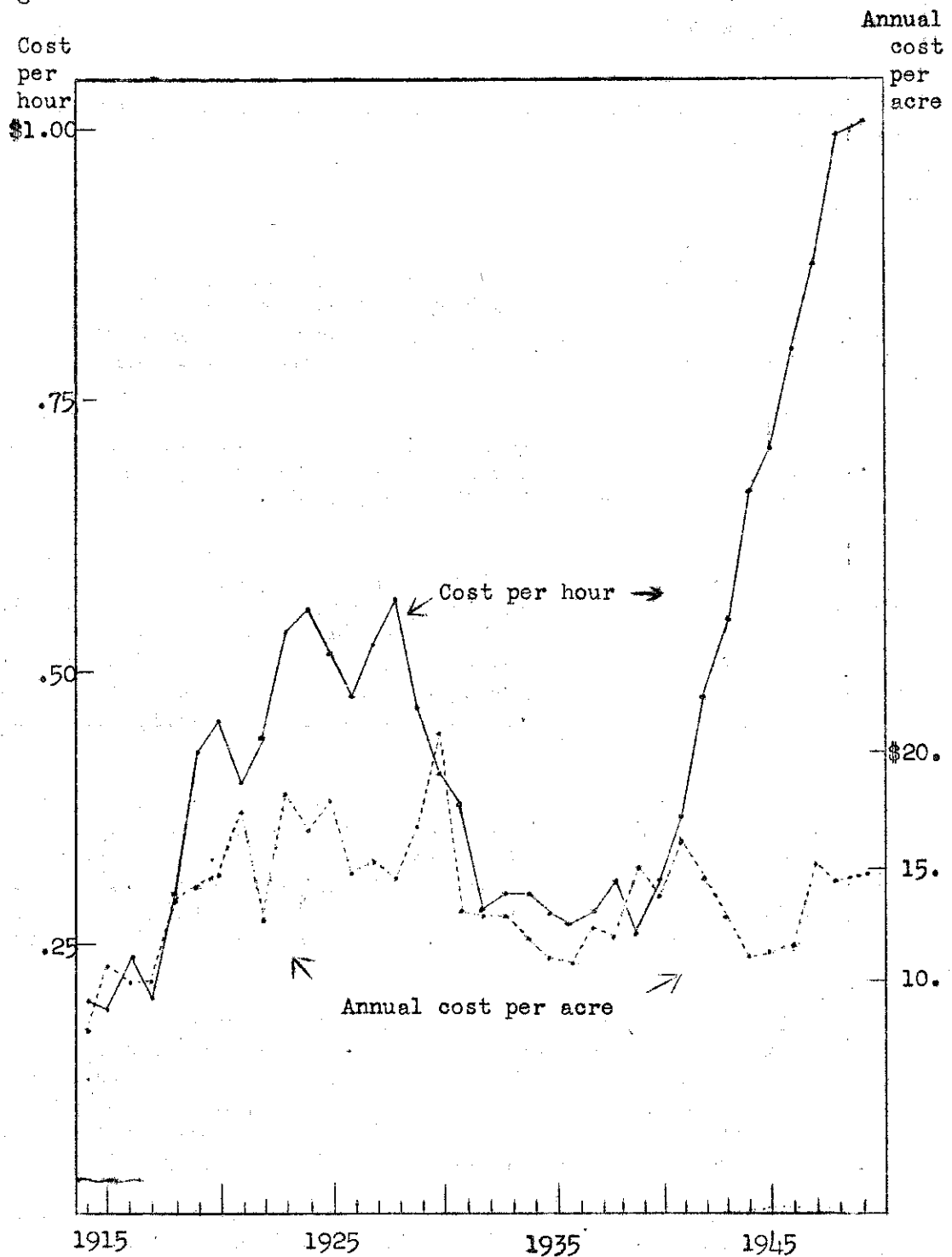


Figure 2.—COST FOR AN HOUR OF LABOR AND THE ANNUAL COST PER ACRE OF CROPLAND, 1914-49, MARKET GARDEN FARM

Wages fluctuate violently. In 1948 wages were four times higher than they were 35 years ago and 75 per cent higher than in the previous war boom.

The cost-per acre for use of cropland has not increased during this boom and is about the same as it was thirty years ago. This difference is in part due to accounting procedure. The value of land has not been adjusted to market changes as quickly as the cost of labor.

In 1930 two acres of woodland were cleared and plowed for the first time, increasing the cost for the use of cropland to \$20.81 per acre for that year. The average cost for the use of land for the different periods of years did not vary greatly from the 35-year average of \$13.56. On this farm, during 1941-48, the cost for the use of an acre of land was about the same, whether owned or rented. If owned, it cost \$12.96; if rented, \$13.39.

Land is relatively a small part of the cost of producing vegetables. During the years the brothers were in partnership, the labor cost was five times as much as the cost for the use of the land. Twenty-five years later, or from 1941-48, labor costs had risen and were ten times higher than land costs (table 2). A part of the high labor cost was due to an increase in the acreage of vegetables that require more work per acre, but most of the increase was due to higher wages (figure 2).

The inefficient use of any cost factor lowers profits, but the inefficient use of labor is the most serious and could be ruinous.

Manure

An account has always been kept with manure which has been credited to the animals and charged to the manure at the rate of \$1.50 to \$3.50 per ton. The hauling has been charged to the manure account and has amounted to about \$1.26 per ton. Since 1929, phosphate has been mixed with manure and charged to the manure account. About 200 tons of manure have been produced annually on this farm.

As many more tons have been purchased. In the beginning, manure in Buffalo could be had for the hauling. By 1928, however, \$10, and the next year, \$15 a month were paid to a milk company for manure. Now the main sources of manure are the stock yards and dairy farms. This farmer has paid as much as \$1.25 and \$1.50 per ton for manure and hauled it, or \$3.50 if delivered.

About six tons for every crop acre including hay and grain were available when manure was plentiful. This amount has been reduced by one-half (table 8).

The manure has not been distributed evenly over the land. Applications on the best grade of land have been about three times as heavy as on the second grade, and applications on the second grade twice as heavy as on the third grade.

The manure account was balanced by distributing the costs to crops according to tonnage applied. The manure was all paid for in the year applied. This is a satisfactory method when manure is applied every year in large amounts.

Since 1945 the cost of the manure has exceeded \$2,000 per year.

Fertilizers

During 1914-28 the brothers purchased a ton of fertilizer for every four acres of cropland. This has been increased until in 1941-48 a ton was purchased for every two crop acres. When they started farming, the brothers made considerable use of organic fertilizers such as garbage tankage, mixed manure, sheep manure, and bone meal. The apparent high application in 1914 (figure 3) was due to the purchase of twenty tons of garbage tankage at a cost of \$11 per ton.

The formulas used in the early years were of low concentration. During World War I, complete fertilizers contained low percentages of nitrogen and potash. A 4-8-4 was first purchased in 1920, a 4-12-4 in 1923, and a 5-10-5 in 1925. By 1930 more tons of 5-10-5 were being used than 4-12-4. In 1939 5-10-10 was purchased for the first time at a cost of \$31 per ton, and since 1941, has accounted for half or more of the fertilizer (figure 4). The largest purchase of 5-10-10 was 62 tons in 1947. In that year and again in 1948, the cost of all fertilizer exceeded \$4,000.

Since 1914, 44 fertilizers of different formulas and 26 other kinds have been used on this Market Garden Farm. Sodium nitrate is the only kind that was purchased every year.

Lime

The brothers purchased lime by the carload and from 1914 to 1928 applied 196 tons. They paid \$4.43 per ton (table 8) and it cost them an additional \$3.11 per ton to haul and spread. The cost of the lime was charged to the crops grown the following four seasons, each paying one-fourth.

During the next twelve years only 40 tons of lime were purchased. But, since 1941, the purchases have been increased to a total of 772 tons.

In recent years, the cost of hydrated lime applied to certain fields was entirely charged to the crops grown the following year. But, the bulk of the costs amounting to \$648 in 1946 and \$757 in 1947 were transferred to the cropland account and then charged to crops as a part of the cost for the use of land. The charge for lime was thus distributed to all crops and entirely paid for in the first year. This is a simple method and, when all of the farm is being limed, may be as satisfactory as any other.

Cover Crop

In order to add organic matter, considerable use has been made of green manures or cover crops. For example, usually after the peas had been picked, the ground was fitted and seeded to medium and mammoth clover which was plowed under the following spring. Rye, however, has

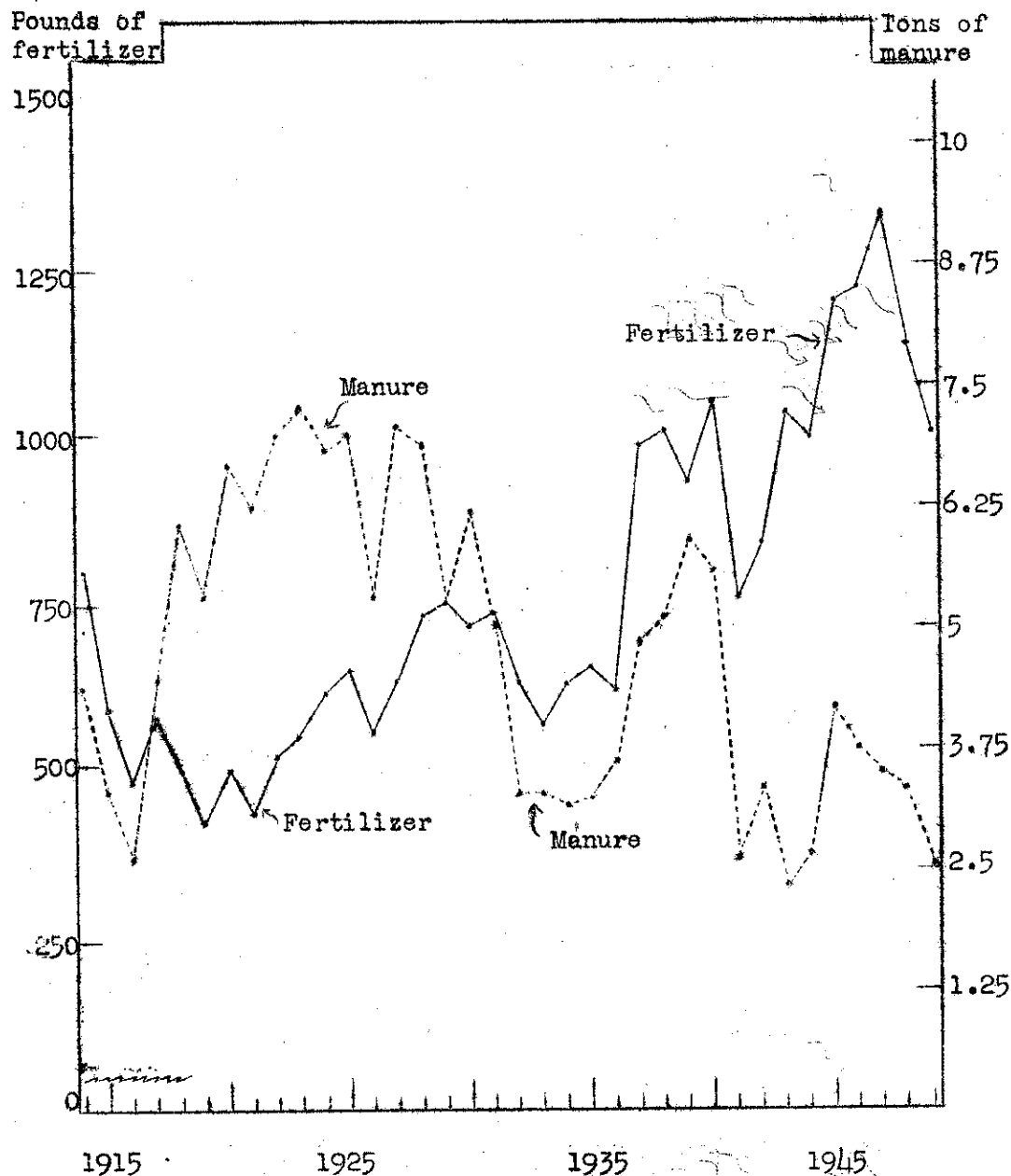


Figure 3.—POUNDS OF FERTILIZER AND TONS OF MANURE PER ACRE CROPPED
1914-49
Market Garden Farm

Manure applications were relatively heavy from 1918-31. During the depression of the thirties the supply was reduced by a half. In recent years the supply has not kept up with the increased acreage. Since no manure has been applied on the rented land, applications on the home farm have been heavier than indicated by the above average. The pounds of fertilizer purchased per acre cropped have increased from 500 pounds in 1916 to 1,300 pounds in 1947. All acres cropped are included although some of them received no fertilizer..

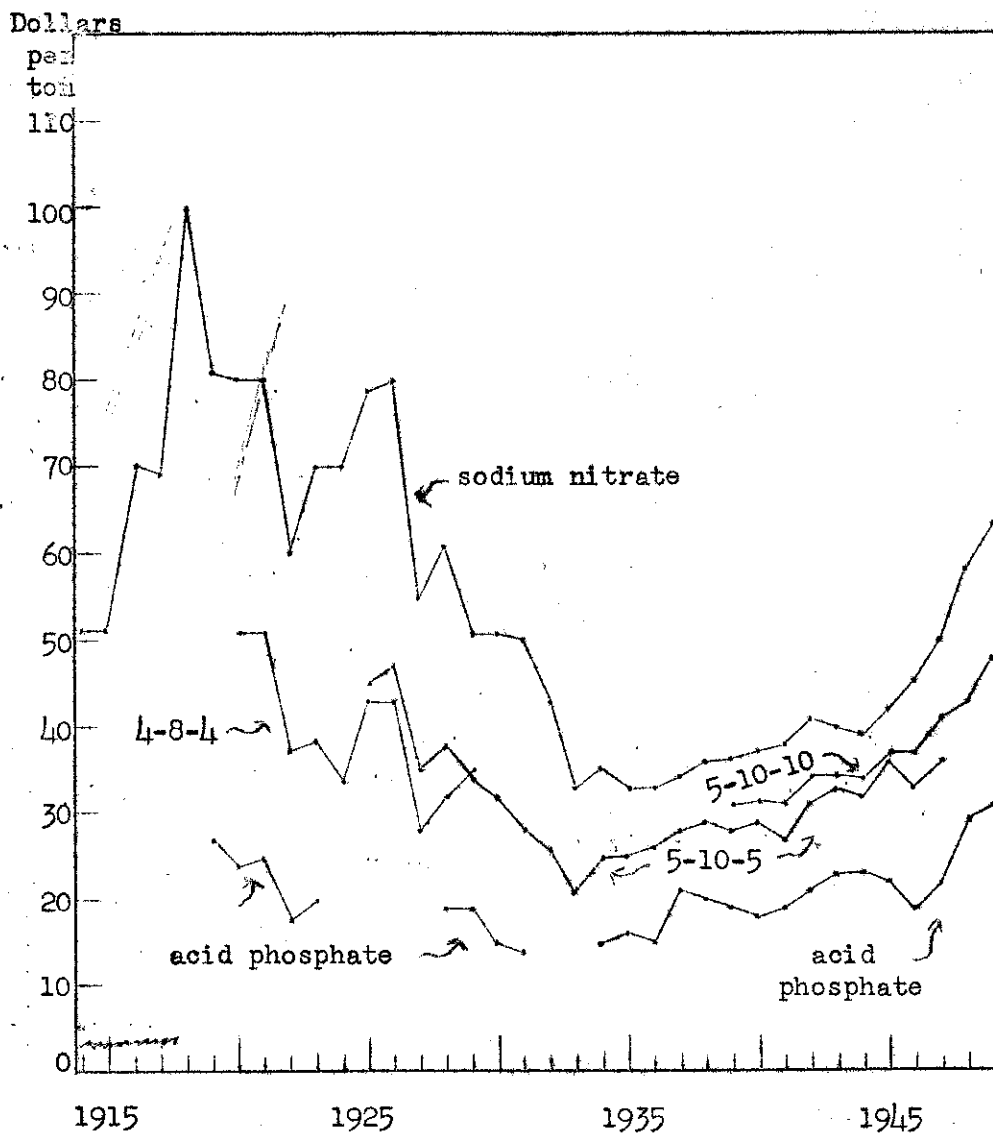


Figure 4.—PRICES PAID PER TON FOR FERTILIZERS, 1914-49
Market Garden Farm

During World War I this farmer paid \$100 per ton for sodium nitrate; 17 years later, \$33 and in 1949, \$64. The amount purchased varied from 200 pounds in 1916 to 13 tons in 1947. Since 1943 the cost per ton has increased 57 per cent for sodium nitrate and 40 per cent for 5-10-10.

been the principal crop used for cover. The cost, including fitting the land, has varied from less than \$5 to more than \$10 per acre and has been charged to the next year's crop.

During 1918-28, the annual cost for all cover crops amounted to about \$200. For the next twelve years, about half this amount was spent but since 1941, the cost has increased to \$276 a year.

In attempting to maintain and improve the fertility of the land, this farmer has spent annually for fertilizers, manure, lime, and cover crops, during the depression, an average of \$23.46 and since 1941, \$37.42 per crop acre (table 8). This does not include the cost of hauling and applying the fertilizer and lime. He has paid two to three times as much for plant food as he has for the use of the land.

TABLE 8: COST AND QUANTITIES OF MANURE, FERTILIZERS, AND LIME
USED BY PERIODS, 1914-48
Market Garden Farm

Kind	1914-28	1929-34	1935-40	1941-48
Cost per ton*				
Fertilizer	\$34.83	\$29.15	\$31.03	\$38.39
Lime	4.43	7.38	5.78	5.18**
Manure	2.68	2.65	2.48	3.67
Quantities per crop acre				
Fertilizer, pounds	578	679	878	1,096
Lime, pounds	305	55	160	975
Manure, tons	5.7	4.3	4.7	3.2
Cost per crop acre*				
Fertilizer	\$10.07	\$ 9.89	\$13.62	\$21.03
Lime	0.68	0.20	0.46	2.52**
Manure	15.38	11.50	11.66	11.86
Cover crops	2.48	1.87	1.36	2.01
Total cost	\$28.61	\$23.46	\$27.10	\$37.42
Crop acres	85.8	61.4	62.5	137.2

* Hauling and spreading are included in the manure but not in the lime and fertilizer costs.

** Lime is priced at market value excluding soil conservation payments. Since 1944 the Government has paid \$570.55 of this farmer's lime bill.

Containers

The market gardeners in this area use second-hand containers. These can be secured in large quantities from chain stores and from dealers who make a business of collecting and reselling them to the farmers. The farmers accumulate a supply through the winter and early spring and store them in large piles near the fields where they will be used. Now bushel baskets and handle baskets are stored under cover.

The account with containers on this farm for 1949 shows that \$1,447 worth were on hand at the beginning of the year and that \$4,390 worth were purchased. Over 50,000 baskets, boxes, and crates were used. Almost 10,000 boxes, costing over \$1,000, were used in marketing the lettuce crop (table 9).

Ten years ago this farmer spent about \$1,100 for packages. In 1924 he paid between 3 and 4 cents for orange crates that last year cost him over 9 cents. In 1914 his total expense for packages was only \$26. When he began farming, most second-hand crates, boxes, and baskets could be had for the hauling.

Marketing

This gardener estimated that, last year, about one-half of his vegetables were sold on the Buffalo market and at least as many more were sold at the farm. Truckers came from as far as North Carolina. Wholesale produce firms supplying independent stores in Northern Pennsylvania and Southern New York furnish an important outlet. Now, with a large acreage, this farm has volume to attract such buyers.

During 1949 over 150 truck trips were made to the Buffalo market. The market opens at 5 o'clock in the morning, and the truck leaves the farm at 3:30. The son who makes the trip to the market is usually back between 10:30 and 11:30 in the forenoon. The 1,160 hours used in making these trips were charged to the marketing account (table 10). A helper was hired on the market. The cost of the labor and use of the truck amounted to about \$2,800. If the other expenses charged to marketing are included, the total cost came to \$3,819.91. This cost was charged to the different vegetables on the basis of packages handled.

TABLE 9: ACCOUNT WITH CONTAINERS, 1949
Market Garden Farm

Debit		Credit	
Inventory, beginning year			
2,500 orange crates	\$ 275.00	Beans, snap 673 bu.	\$ 88.67
2,500 bruce crates	275.00	Beets 255 crates	20.70
1,500 Iceberg crates	180.00	Broccoli 90 peck bkt.	6.43
200 tomato lugs	6.24	224 crates	15.30
300 California crates	15.00	Cabbage 800 bu.	91.85
1,000 covers	15.00	2,802 crates	307.84
200 hampers	15.00	2,556 boxes	263.33
2,100 bushel baskets	126.00	Cauli- 1,216 crates	115.50
7,200 8-quart baskets	540.00	flower 2,290 boxes	235.93
Cash purchases		Chard 21 crates	2.95
8,415 orange crates	787.35	Celery 300 crates	26.82
2,318 bruce crates	247.84	301 lugs	12.83
2,200 quart baskets	31.00	Celery 80 lugs	3.39
2,795 Iceberg crates	349.85	cabbage 187 boxes	19.27
470 celery crates	64.31	Cucumbers 100 peck bkt.	7.14
105 beet crates	4.20	489 bu.	65.39
700 tomato lugs	30.50	Endive 88 bu.	10.10
8,914 boxes	918.37	330 crates	22.50
4,750 covers	68.50	Eggplant 386 bu.	44.35
630 tangerine crates	43.00	Lettuce 6,108 crates	683.38
100 hampers	15.00	3,606 boxes	371.51
55 egg cases	7.70	Muskmelons 2,355 bu.	270.68
11,558 bushel baskets	1,509.07	Mustard, turnip greens	
4,026 8-quart baskets	294.05	977 bu.	112.16
83 berry crates	19.35	Parsley 275 boxes	28.33
81 man hours	87.51	Peas 47 bu.	5.40
3 tractor hours	2.25	Peppers 200 peck bkt.	14.28
80 truck miles	15.95	1,538 bu.	214.38
Use of buildings	308.63	Radishes 4 bu.	.45
		Spinach 250 bu.	28.70
		408 crates	39.37
		Squash 576 peck bkt.	41.13
		1,369 bu.	157.16
		300 crates	38.07
		Sweet corn 3,833 crates	369.88
		Tomatoes 1,082 bu.	124.21
		5,360 peck bkt.	382.93
		Greenhouse 399 lugs	16.92
		100 peck bkt.	7.14
		Strawberries 83 crates	19.35
		2,200 quarts	31.00
		Hens 55 egg cases	7.70
		Sold 206 orange crates	20.00
		Inventory, 16,350 packages	
			1,711.54
		Bal. to marketing acc't	195.71
			\$6,251.67
	\$6,251.67		

TABLE 10: MARKETING ACCOUNT, 1949
Market Garden Farm

Debit		Credit	
		Per cent*	
Canvas repair & ropes	\$ 6.00	Beans, snap	2 \$ 76.40
Ice, 2,000 pounds	3.54	Beets	1/2 19.10
Rent, 2 stalls in market	150.00	Broccoli	1/2 19.10
Trip to Kane		Cabbage	14 534.79
gas and oil	3.20	E. cauliflower	2 76.40
meals	2.00	L. cauliflower	1 38.20
Phone	121.44	Cauliflower on	
Auto, 2,000 mi. @ .042	84.69	shares	4 152.80
Truck, 5,930 mi.	1,182.51	Chard	1/4 9.55
Use of buildings	289.50	Celery	2 76.40
Water system	32.72	Celery cabbage	1/4 9.55
Bal. from container acc't	195.71	Cucumbers	2 76.40
Labor		Endive	1/2 19.10
Market trips, 1,160 hours		Eggplant	1 38.20
	1,253.23	Lettuce, Iceberg	20 763.98
Helper on market	360.00	Lettuce, other	2 76.40
Other labor, 42 hours	45.37	Muskmelon	5 191.00
Miscellaneous, general		Mustard, turnip	
expense	90.00	greens	2 76.40
		Parsley	1 38.20
		Peas	1/4 9.55
		Peppers	4 152.80
		Spinach	1 38.20
		Squash	5 191.00
		Sweet corn	11 420.15
		Tomatoes	17 649.39
		Greenhouse	3/4 28.65
		Strawberries	1 38.20
	\$3,819.91		100 \$3,819.91

* Per cent of total packages; the marketing cost was distributed on the basis of packages handled.

INCOME ACCOUNTS
Relative Importance

Vegetables

Since 1914 accounts have been kept with forty-five different kinds of crops and livestock (table 11). An average per year of 15,454 hours of labor has been charged directly to these accounts. About four-fifths of this labor was spent on vegetables, 12 per cent on livestock, less than 4 per cent on hay and grain and 1 per cent on fruit, including berries. Approximately, these proportions held throughout the 35-year period. However, changes have occurred in the relative importance of the individual crops and livestock.

During the 35-year period, more time has been spent on peas than on any other enterprise (table 11). The brothers, from 1914-28, grew 10 to 25 acres (table 12). Because of the labor involved in harvesting, the hours charged to peas accounted for 29.5 per cent of the hours. Since 1928 less peas have been grown and by 1939, the acreage was reduced to two. The acreage was again increased to 16 in 1945, and again decreased to two in 1948. The plans are to plant one-half acre in 1950.

The next enterprise requiring the most labor was the growing of plants in the greenhouses and cold frames which amounted to 608 hours in 1914 and 3,206 hours in 1948. Seventy per cent of this work occurred between the middle of February and the middle of May.

Throughout the 35-year period, the largest acreage was planted to sweet corn. Each year, the brothers planted approximately 20 acres. They and their help spent more time on peas and sweet corn than on all the other vegetables combined. After the farm was divided, 10 to 15 acres of sweet corn were grown. By 1942 the acreage again reached 20, and 50 acres were planted in 1949. From 1941-48 less than 4 per cent, but in 1949, 13 per cent of the labor was spent on sweet corn.

Acreages for most crops have increased in recent years because extra land has been rented since 1941, and a farm purchased in 1944.

Perhaps the greatest expansion in acreage has occurred in tomatoes. For 27 years, the acreage varied but little from the average of two. Then in 1942, it was increased to 5, the next year to 10, the next to 13, and in 1946, to 18.5 acres.

By 1945 the pepper acreage had been expanded to seven. Peppers occupied less than an acre in the early years. Then in 1926, 1.5 acres were set. This was about the acreage planted until 1941.

The acreage of cauliflower has been increased even more than peppers. In the earlier years, usually less than an acre was grown. During the late thirties this was increased to 5, and during the forties, to 9, and by 1949, to 17.8.

TABLE 11: HOURS OF LABOR BY ENTERPRISES
FOR INDICATED PERIODS, 1914-48
Market Garden Farm

Enterprise	Per cent of total hours for indicated years			
	1914-28 15 years	1929-40 12 years	1941-48 8 years	1914-48 35 years
Vegetables				
Peas	29.5	7.7	8.8	15.4
Plants - greenhouse	6.7	10.0	9.7	8.8
Sweet corn	13.6	6.7	3.9	7.9
Tomatoes	4.4	4.3	9.3	6.3
Lettuce	5.2	6.9	6.4	6.1
Celery	---	1.8	10.9	4.7
Cauliflower	0.8	5.8	5.4	4.0
Spinach	3.0	6.3	2.9	3.9
Cabbage	4.7	3.0	3.6	3.8
Beans, snap	0.6	5.1	5.6	3.8
Muskmelon	1.6	4.3	3.3	3.1
Endive	---	3.3	4.0	2.5
Peppers	0.8	2.1	3.4	2.2
Beets	---	3.5	2.4	1.9
Potatoes	4.8	0.3	---	1.7
Eggplant	2.2	1.3	0.3	1.2
Squash	0.2	1.1	1.4	0.9
Broccoli	---	1.6	1.2	0.9
Cucumbers	0.6	0.7	1.2	0.9
Parsley	---	1.4	1.1	0.8
Celery cabbage	0.7	1.1	0.2	0.6
Radishes	*	0.7	0.8	0.5
Mustard, turnip greens	---	0.2	0.5	0.2
Carrots	---	0.8	---	0.2
Chard	---	0.1	0.5	0.2
Kohlrabi	---	0.2	0.2	0.1
Onions	0.1	0.3	*	0.1
Rutabagas	---	0.3	*	0.1
Chicory	---	0.1	0.1	*
Total for vegetables	79.5	81.0	87.2	82.9

* Less than 0.06 per cent.

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TABLE 11: HOURS OF LABOR BY ENTERPRISES
FOR INDICATED PERIODS, 1914-48 (Con'd)
Market Garden Farm

Enterprise	Per cent of total hours for indicated years			
	1914-28 15 years	1929-40 12 years	1941-48 8 years	1914-48 35 years
Fruit				
Strawberries	---	1.5	0.4	0.6
Apples	1.0	0.1	---	0.3
Raspberries	---	1.0	---	0.3
Peaches	*	---	---	*
Total for fruit	1.0	2.6	0.4	1.2
Hay and Grain				
Hay	2.0	1.5	0.6	1.3
Corn for silage	0.1	1.1	0.8	0.6
Wheat	0.7	0.6	0.4	0.6
Oats	1.0	0.4	0.3	0.6
Corn for grain	0.8	---	0.1	0.3
Rye	---	---	*	*
Total for hay and grain	4.6	3.6	2.3	3.4
Livestock				
Cattle	11.0	6.1	4.0	6.9
Hens	1.9	4.7	4.1	3.6
Chicks	*	1.7	1.9	1.2
Hogs	1.3	0.3	0.1	0.6
Colts	0.6	---	---	0.2
Total for livestock	14.9	12.8	10.1	12.5
Total all enterprises	100.0	100.0	100.0	100.0
Average hours per year	11,982	12,695	26,102	15,454

* Less than 0.06 per cent

TABLE 12: ACREAGES OF VEGETABLES
FOR INDICATED PERIODS, 1914-48
Market Garden Farm

Enterprise	Average acreage per year				Per cent of total acreage 35 years
	1914-28 15 years	1929-34 6 years	1935-40 6 years	1941-48 8 years	
	Acres	Acres	Acres	Acres	Per cent
Vegetables					
Sweet corn	19.2	13.5	13.4	22.4	18.3
Peas	15.5	7.7	2.8	9.9	10.9
Cabbage	4.6	2.4	3.8	10.3	5.4
Tomatoes	2.7	2.0	2.2	11.7	4.6
Spinach	2.8	3.2	5.1	6.4	4.2
Muskmelon	1.6	2.1	4.0	6.7	3.3
Cauliflower	0.6	1.1	4.7	8.6	3.3
Lettuce	1.6	1.2	3.2	6.0	2.8
Potatoes	5.4	0.7	---	---	2.5
Peppers	0.6	1.5	1.6	5.5	2.1
Celery	---	---	0.7	6.0	1.5
Beans, snap	0.2	0.9	1.6	4.0	1.5
Squash	0.3	0.8	1.7	4.0	1.5
Eggplant	1.2	0.8	1.3	0.6	1.0
Broccoli	---	0.6	1.5	2.4	0.9
Cucumbers	0.4	0.4	0.5	1.5	0.7
Celery cabbage	0.6	0.7	1.1	0.2	0.6
Endive	---	---	1.1	1.4	0.5
Beets	---	0.4	1.1	0.6	0.4
Mustard, turnip greens	---	0.1	0.3	0.7	0.2
Rutabagas	---	0.3	0.4	0.1	0.2
Radishes	*	0.2	0.2	0.4	0.2
Carrots	---	0.2	0.2	---	0.1
Onions	0.1	---	0.1	---	0.1
Kohlrabi	---	*	0.2	0.1	0.1
Chard	---	---	*	0.2	*
Parsley	---	*	*	0.1	*
Chicory	---	0.1	*	*	*
Total vegetables	57.4	40.9	52.9	109.8	66.9

* Less than 0.06

The increase in the acreage of muskmelon has been quite similar to that of cauliflower. Four to five acres of cabbage were grown in the early years. After the farm was divided, 1.6 acres were set. Since 1929 the acreage has been increased 14 times and decreased five. The largest acreage of cabbage was grown in 1946, a total of 13.8 acres.

Lettuce is unique in that the percentage of the hours spent on the crop has been nearly constant. Lettuce used 5.2 per cent of the labor during 1914-28, 6.9 per cent during 1929-40, and 6.4 per cent during 1941-48. No other crop or livestock enterprise approaches this uniformity. From one to two acres of lettuce were grown during the first 21 years. This was increased to three in the late thirties and to six in the forties.

Other vegetables for which acreages have been increased include spinach, snap beans, broccoli, cucumbers, and squash. Spinach occupies the land only part of the season and the late crop serves as a cover crop. From 1914-34 the acreage increased 13 times and decreased 7, an increase from 1.75 acres in 1914 to 4.42 in 1934. Since 1934 the increases and decreases are about equal. The maximum of nine acres was planted in 1943.

The first year that snap beans amounted to as much as an acre was in 1926. Except for 1936, the acreage did not exceed two until 1942. The maximum acreage planted was 6.5 acres in 1944.

The first account kept with broccoli appeared in the 1930 books when 0.27 of an acre was reported. Not until 1939 were as many as two acres grown. The acreage was increased to four in 1944 but dropped to one in 1948.

Since 1914 cucumbers have been omitted in seven years and in 19 years only part of an acre was grown. The largest plantings, 2.5 acres, occurred in 1947 and 1948.

Squash has been planted each year since 1925 when 1 1/2 acres of squash and pumpkins were grown in the woods. The acreage continued to be under two until 1941. The maximum acreage, 6.7, was grown in 1946.

Since the early thirties, about 500 dozen bunches of parsley have been sold from a fraction of an acre.

Beets appeared in the account books for the first time in 1929 when .06 of an acre was reported. Since then, beets have been grown each year but in only five of the years has as much as one acre been planted.

Endive was not produced on this farm until 1936 and celery not until 1938. Since 1941 an average of six acres of celery has been grown. During the forties, more labor was spent on celery than on any other crop. From one to two acres of endive have been grown since 1938.

The only important vegetable to be discontinued permanently has been potatoes. When the brothers were in partnership, they grew each year from three to ten acres. After the division, about an acre was grown for a couple of years. Since then, none have been grown commercially.

In addition to peas, eggplant and celery cabbage are the only important vegetables to show a decrease in acreage in recent years. On an average, about an acre of eggplant was grown each year for thirty years. Then, for four years, from 1943 to 1946, none was planted. In 1947 an acre was grown and in 1948, one and one-half acres. In 1914 celery cabbage was included in the early cabbage account. Except for two years, about an acre was grown each year for 28 years. But in four of the past six years, none was grown.

The eight vegetables listed at the end of table 11 have not been grown in sufficient quantity in any period to account for as much as 1 per cent of the labor.

Fruit

In 1914 and 1915, the brothers set 3.8 acres of peaches and they had three acres of apples. The peach trees were taken out in 1916, and the apple orchard was all pulled by 1928.

Raspberries and strawberries were grown during the thirties. The plantings for each never amounted to an acre (table 13) until a 1 3/4 acre bed of strawberries was started in 1948.

Hay and Grain

Some of the land on the farm is more suitable for roughage and grain crops than for vegetables. The brothers used about thirty acres for hay and grain. This acreage was reduced to twenty in the thirties and increased to 47 during the forties. Hay and grain accounted for nearly one-third of the cropland but for only 3.4 per cent of the labor. More hours of labor were spent on spinach than on hay and grain.

Livestock

Since 1914, it has been the practice on this farm to winter cattle. The cows and steers are purchased in the fall and usually disposed of by April 1st. They consume most of the roughage grown on the farm, provide manure for the vegetables, and chore work during the winter. Twice as much time was spent on cattle as on the grain and hay crops.

A farm flock of forty hens was kept in 1914. Twelve years later, the number had increased to 100, in 1933 to 255, and by 1937 to 421. Many of the hens were sold during the spring and early summer. Of the 1,535 layers on hand November 1, 1945, only 232 were left by July 1st. The 13-month average from January, 1945 to January, 1946 was 949 hens, and for the following year, 705.

The first chicks were purchased in 1925 when 150 were bought. The number purchased reached 1,000 for the first time in 1936. Only once have the purchases exceeded 2,000 when in 1945, 3,695 were bought.

In twenty-five of the past thirty-five years, pigs were kept. The number sold or slaughtered varied from 38 in 1916 to 1 in 1942.

During 1914 to 1923, five colts were started and four horses raised.

TABLE 13: ACREAGES OF HAY, GRAIN, AND FRUIT AND NUMBER OF LIVESTOCK
FOR INDICATED PERIODS, 1914-48
Market Garden Farm

Enterprise	Average per year				Per cent of total acreage 35 years
	1914-28 15 years	1929-34 6 years	1935-40 6 years	1941-48 8 years	
<u>Fruit</u>	Acres	Acres	Acres	Acres	Per cent
Apples	2.3	*	---	---	1.0
Peaches	0.5	---	---	---	0.2
Strawberries	---	0.4	0.5	0.1	0.2
Raspberries	---	0.1	0.7	---	0.1
Total fruit	2.8	0.5	1.2	0.1	1.5
<u>Hay and Grain</u>					
Hay	20.8	14.5	11.8	20.5	18.4
Wheat	3.5	4.2	4.5	12.1	5.8
Oats	4.5	4.3	3.1	8.2	5.2
Corn for silage	---	---	0.9	4.4	1.2
Corn for grain	1.1	---	---	1.5	0.8
Rye	---	---	---	0.7	0.2
Total, hay and grain	29.9	23.0	20.3	47.4	31.6
Total all crops	90.1	64.4	74.4	157.3	100.0
	Number	Number	Number	Number	
<u>Livestock</u>					
Cattle, wintered	32	20	29	31	
Hens, 13 months' average	67	170	381	727	
Chicks started	--	300	1,265	1,803	
Hogs, butchered and sold	8	1	2	2	
Colts, total raised	4	0	0	0	

* Less than 0.06

CROP YIELDS

From Year to Year

Variations in crop yields from year to year are largely caused by weather. Excessive rains in spring and droughts in summer are not uncommon. The rainfall at the United States weather station in Buffalo from May 1 to September 30 has been as light as 7.23 inches and as heavy as 29.33. 1/ The length of the growing season has also varied from 142 days to 217. Weather influences quality of vegetables as well as quantity.

Cabbage seems to have withstood the changeableness of the weather better than the other crops. The difference in the acre-yield of cabbage from one year to the next averaged 82 bushels. This difference was 20 per cent of 415 bushels, the average yield. For the other crops grown on this farm, the difference in the yield from year to year in relation to the average yield varied from 28 to 70 per cent (table 14). A very large difference in the yield per acre of cabbage occurred in 1934 and 1935 when a yield of 166 bushels was followed by a yield of 535. But, for one-half of the years, the difference in yields from year to year was 58 bushels or less.

Wheat has averaged 28 bushels per acre and the difference in yield from year to year has averaged 8. The variation was 29 per cent of average. The per cent variation in the yields of sweet corn and lettuce has been similar to that of wheat.

Hay has shown a variation from the average of 32 per cent. The yields of peppers and snap beans have been about as variable as the yields of hay. Spinach, peas, muskmelon, and cauliflower have been somewhat more variable.

Oat yields have shown a variation from the average of 61 per cent. Vegetables showing the greatest variability in yields include potatoes, tomatoes, eggplant, and cucumbers. These crops seem to be the most sensitive to weather.

Over a Period of Years

An annual index of the yields per acre for all vegetables was calculated using the 1935-40 averages as 100.*

1/ "The Climate of New York State", R. A. Mordoff, Cornell Extension Bulletin 764, December, 1949

* The yield index was calculated for each year by dividing the production of each crop by the average yield per acre for 1935-40, as given in the last table of this report. The sum of the quotients was then divided by the sum of the acreage grown and multiplied by 100.

TABLE 14: VARIABILITY OF YIELDS, 1914-48
Market Garden Farm

Crop	Number of years*	Unit	Average per acre		Per cent variation is of average
			Units per acre**	Year to year variation	
Vegetables					
Cabbage	35	bushels	415	82	20
Sweet corn	35	dozen ears	584	164	28
Celery	9	dozen stalks	669	186	28
Lettuce	35	dozen heads	2,321	685	30
Beans, snap	19	bushels	193	60	31
Peppers	20	bushels	228	75	33
Endive	11	1-1/2 dozen heads	810	294	36
Spinach	35	bushels	467	176	38
Peas	35	bushels	152	59	39
Muskmelon	27	bushels	239	98	41
Cauliflower	20	bushels	308	142	46
Broccoli	13	8-quart baskets	442	214	48
Squash	19	bushels	182	93	51
Potatoes	17	bushels	170	90	53
Tomatoes	35	bushels	367	198	54
Eggplant	21	bushels	476	302	63
Celery cabbage	26	dozen heads	311	216	69
Cucumbers	11	bushels	293	204	70
Hay and Grain					
Wheat	31	bushels	28	8	29
Hay	35	tons	2.1	.68	32
Oats	24	bushels	46	28	61

* Number of years an acre or more was grown.

** An average of averages: The sum of the yields per acre was divided by the number of years.

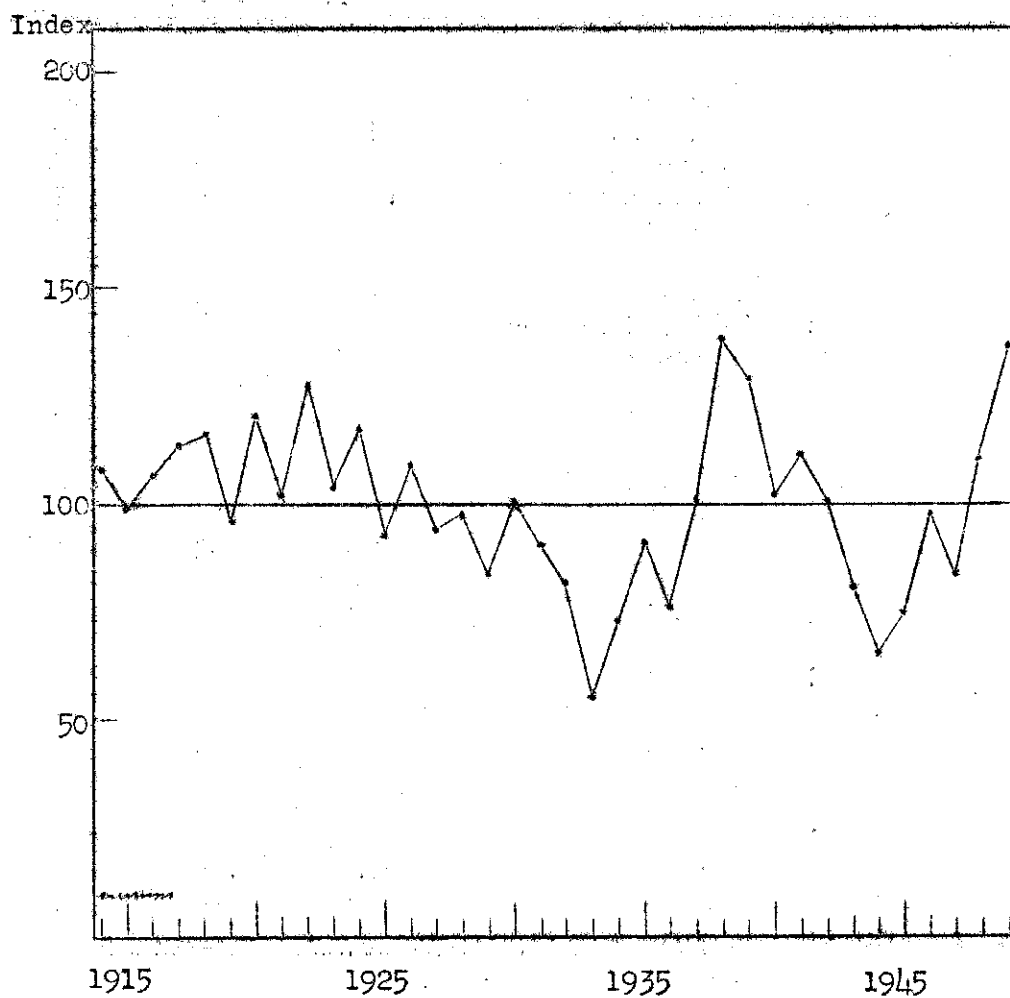


Figure 5: INDEX OF VEGETABLE YIELDS PER ACRE 1935-40 = 100
Market Garden Farm

The indexes show no sustained upward trend in yield per acre. It is difficult to raise the general average when the yields are already high.

The highest sustained yields occurred during the first 11 years, from 1914-24 (figure 5). In 9 of the 11 years, the crop yield indexes were over 100. The lowest was 96 in 1919. The average was 110.

During the following 12 years, from 1925-36, the yields indexes were about a fifth lower. In 10 of the 12 years, they were below 100 and averaged 87. Throughout the summer of 1933, the moisture deficiency was so acute that the vegetables yielded only half a crop. The yield index was 55 per cent.

The yields then improved and during the six years from 1937-42, the yield index each year exceeded 100 and reached in 1938 an all-time-high of 139 per cent which was repeated in 1949. Except for 1948 and 1949, the yield index for each year since 1942 has been below 100.

The yields have been somewhat lowered by the changed make-up of the farm. One-half of the acreage of the best land was divided with the brother in 1929. Since 1941, land has been rented and in 1944, a farm was purchased, the fertility of which is being improved.

The trend in yields is probably upward for muskmelon, peppers, peas, and tomatoes. The first year since 1922 that melons produced 300 bushels per acre was in 1936. Since then, the acre-yield has exceeded 300 bushels in five years out of twelve. The highest yield of 507 bushels occurred in 1938. Melon yields have averaged 50 per cent higher and pepper yields 28 per cent higher since irrigation was started in 1934 (table 16).

Cabbage yields per acre have averaged about the same for each period except that yields were unusually high from 1935-40 (table 15). During this period the yield twice exceeded 600 bushels and was over 500 bushels in three of the other years. Before 1935 a yield of 500 bushels or more occurred in only four years out of 21 and since 1940, in only one year out of eight.

Not much more than half a crop of peas was harvested during the years 1929-34. In five of the years, the acre-yield was less than 100 bushels and reached a low of 49 bushels in 1934. In the 15 years prior to 1929, a yield of less than 100 bushels occurred only once, but has occurred three times since 1934. The increasing frequency of low yields may be one reason for discontinuing the pea crop.

The yield of tomatoes may be cut in half by an early killing frost or doubled if the frost comes late. Since irrigation, tomato yields have increased 37 bushels per acre (table 16).

Sweet corn yields were highest during 1914-28 when for 10 years, the acre-yield exceeded 700 dozen ears. Since 1928, such a high yield has been obtained but once. Sweet corn varieties have changed from Champion and Stowell's Evergreen to Golden Cross and hybrid strains.

TABLE 15: CROP YIELDS BY PERIODS, 1914-48
Market Garden Farm

Crop	Unit	Average yield per acre*			
		1914-28	1929-34	1935-40	1941-48
Vegetables					
Muskmelon	bushels	207	188	322	240
Cabbage	bushels	389	366	558	392
Tomatoes	bushels	360	261	392	438
Peas**	bushels	159	90	181	162
Spinach	bushels	421	646	477	410
Cucumbers	bushels	299	106	347	294
Sweet corn	dozen ears	727	478	500	458
Eggplant	bushels	572	496	291	414
Lettuce	dozen heads	2,799	2,719	1,874	1,464
Cauliflower	bushels	---	198	408	345
Peppers	bushels	250	173	249	281
Broccoli	8-quart baskets	---	---	499	415
Endive	1-1/2 dozen heads	---	---	946	776
Beans, snap	bushels	---	208	242	192
Index, vegetable yields per acre		101	76	100	86
Hay and Grain					
Hay	tons	2.1	2.1	2.3	1.8
Oats	bushels	54	42	46	35
Wheat	bushels	29	30	30	26
Index, hay and grain yields per acre		100	94	100	80

*An average of averages: The sum of the yields per acre was divided by the number of years.

**Unshelled

The vegetable that has shown a decided downward trend in yield has been lettuce. The yield from year to year has decreased 20 times and increased fourteen. Iceberg lettuce has been grown since 1937. When measured by dozen of heads, changing the type of lettuce has been a factor in decreasing yields. Iceberg lettuce has been set 16 inches on the square while other lettuce has been set 10" x 12". In recent years, from 80 to 90 per cent of the lettuce has been Iceberg.

Spinach, cauliflower, broccoli, snap beans, and endive have shown no sustained increase in acre-yields.

TABLE 16: YIELDS BEFORE AND SINCE IRRIGATION WAS STARTED, 1914-48
Market Garden Farm

Crop	Unit	Median yield			
		Units per acre		Year to year variation in yield	
		1914-34	1935-48	1914-34	1935-48
Cabbage	bushels	370	476	49	64
Sweet corn	dozen ears	687	467	106	215
Lettuce	dozen heads	2,596	1,553	701	513
Peppers	bushels	199	254	77	64
Spinach	bushels	439	422	166	112
Peas	bushels	138	164	48	46
Muskmelon	bushels	179	270	108	99
Tomatoes	bushels	349	386	141	206

PRICES OF FARM PRODUCTS

Vegetable Prices Over a Period of Years

In the past 37 years, two war booms and one major depression have occurred. During the first war boom, vegetable prices almost trebled. For example, the season's price for a bushel of cabbage increased from 33 cents in 1914 to \$1.00 in 1919, cucumbers from 50 cents to \$1.53, eggplant from 74 cents to \$2.40, and potatoes from 38 cents to \$2.00. Pea prices increased from 33 cents per bushel in 1915, an all-time-low, to \$1.86 in 1919, and a dozen ears of sweet corn from 9 to 21 cents. The price index for all the vegetables rose from 52 in 1915 to 144 in 1919, an increase of 177 per cent (figure 6).* The high prices for vegetables caused by World War I continued for 11 years or until 1929.

Then came the crash. For six years, prices rapidly dropped, and by 1935, were almost back to the 1914 level. For example, the season's price for a bushel of cabbage dropped from 83 cents in 1929 to 42 cents in 1934; eggplant from \$1.09 to 38 cents; muskmelon from \$2.75 to \$1.23; peppers from \$1.97 to 68 cents; spinach from 72 cents to 35 cents; squash from \$1.57 to 62 cents and peas from \$2.09 to 88 cents. Sweet corn per dozen ears declined from 27 to 11 cents, and celery cabbage per dozen heads from \$1.17 to 37 cents. The vegetable price index dropped from 168 in 1929 to 81 in 1935, a decrease of 52 per cent.

Finally the decline stopped, and in 1936, prices turned upward. But the 1936 price gains were wiped out by the declines of 1937 and 1938.

Then came World War II. By 1942, vegetables were selling as high as in 1919 and by 1943, 40 per cent higher. The average price for a bushel of snap beans increased from \$1.07 in 1938 to \$3.18 in 1943; muskmelon from 74 cents to \$2.87; peppers from 78 cents to \$2.59; and cucumbers from 85 cents to \$2.62. The average price for a bushel of peas increased from \$1.22 in 1941 to \$2.89 in 1945; cauliflower from 84 cents to \$3.15; and spinach from 51 cents to \$1.29. Sweet corn averaged only 13 cents per dozen ears in 1940 compared with 53 cents in 1948. The vegetable price index rose from 86 in 1938 to 241 in 1947, an increase of 180 per cent.

Since 1929, compared with 1914-28, the vegetables that sold at the highest prices have been lettuce, cucumbers, and sweet corn (table 17). Tomato prices might have been equally high if none had been sold to the canning factories. Since 1942 38 per cent of the crop has been sold to canners. Tomatoes to the factory returned about 70 cents per bushel compared with \$1.80 in the market.

* The price index for each year was calculated by multiplying the units of each crop sold by the 1935-40 price as given in the last table of this report. The sum of the actual sales was divided by what the sales would have been at 1935-40 prices, and the quotient multiplied by 100.

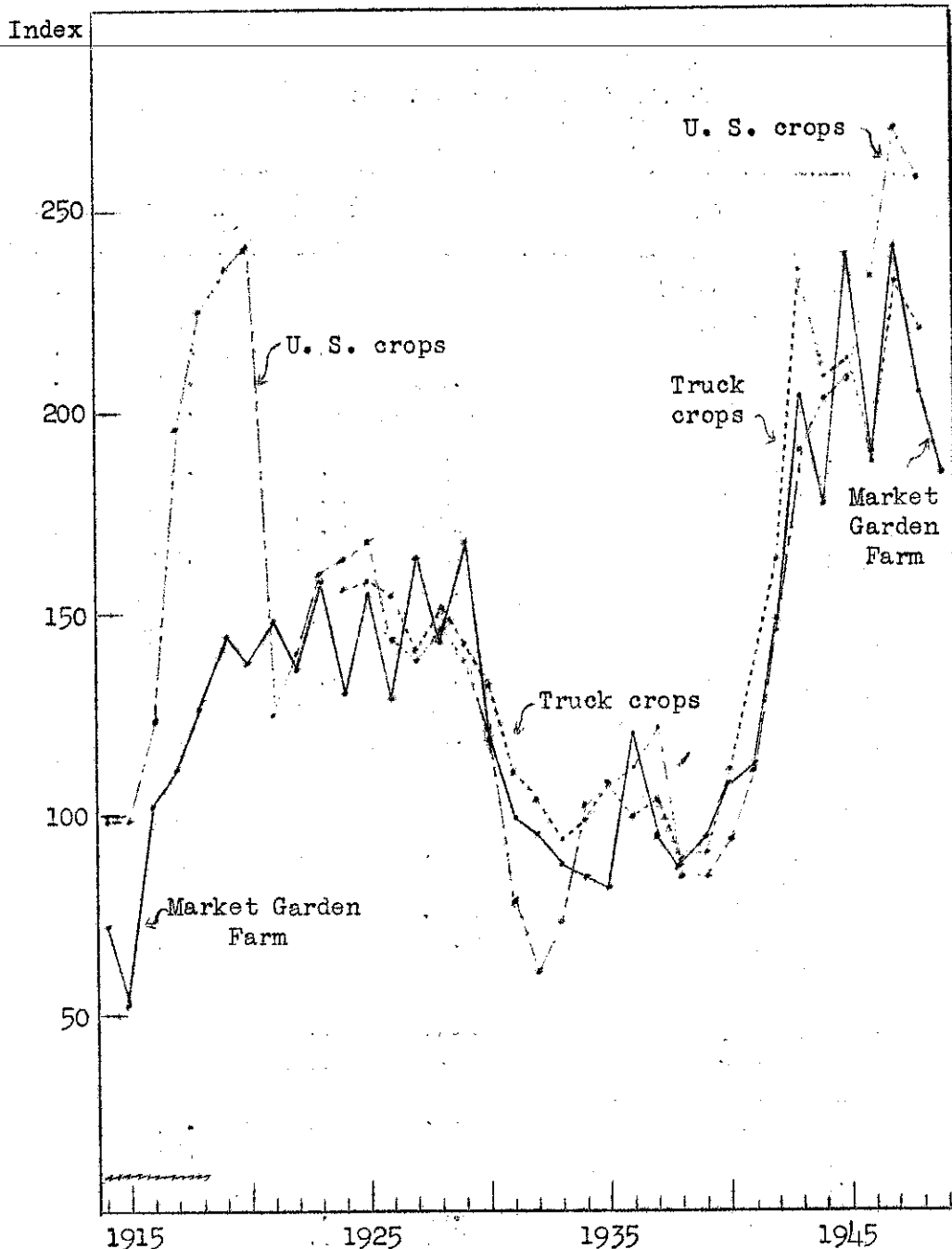


Figure 6.—INDEX NUMBERS - VEGETABLE PRICES ON MARKET GARDEN FARM; UNITED STATES FARM CROP AND TRUCK CROP PRICES ^{1/}

United States crop prices were much higher in World War I than on the Market Garden Farm. Since World War I the United States price for crops and truck crops and prices on the Market Garden Farm have followed the same general pattern.

Prices rose rapidly during World War I, remained high for 11 years, dropped precipitously in the great depression of the thirties, rose to unprecedented heights in the greatest boom ever experienced - that of World War II.

^{1/} Bureau of Agricultural Economics, United States Department of Agriculture.

TABLE 17: AVERAGE PRICES OF FARM PRODUCTS
FOR INDICATED PERIODS, 1914-48
Market Garden Farm

Kind	Unit	Average price per unit*			
		1914-28	1929-34	1935-40	1941-48
Lettuce	dozen heads	\$0.35	\$0.29	\$0.29	\$0.76
Cucumbers	bushels	1.19	1.41	1.07	2.57
Sweet corn	dozen ears	0.21	0.18	0.14	0.38
Tomatoes	bushels	0.91	0.83	1.03	1.39
Peas	bushels	1.33	1.20	1.17	1.95
Spinach	bushels	0.57	0.45	0.43	0.83
Cabbage	bushels	0.72	0.60	0.58	1.05
Cauliflower	bushels	1.23	0.81	0.81	1.54
Celery cabbage	dozen heads	0.83	0.62	0.52	0.93
Eggplant	bushels	1.10	0.57	0.58	1.21
Beans, snap	bushels	2.51	1.70	1.21	2.70
Squash	bushels	1.21	0.82	0.74	1.19
Peppers	bushels	1.72	1.06	0.91	1.66
Muskmelon	bushels	2.35	1.45	1.07	2.26
Chicory	bushels	----	0.44	0.38	0.63
Radishes	dozen bunches	0.12	0.20	0.15	0.37
Celery	dozen stalks	----	----	0.52	1.15
Beets	dozen bunches	----	0.46	0.39	0.79
Endive	1-1/2 dozen heads	----	----	0.59	1.22
Chard	dozen bunches	----	----	0.47	0.97
Mustard, turnip greens	bushels	----	----	0.49	1.01
Broccoli	8-quart baskets	----	0.45	0.37	0.76
Parsley	dozen bunches	----	0.37	0.38	0.73
Kohlrabi	dozen bunches	----	0.52	0.43	0.72
Rutabagas	bushels	----	0.74	0.71	0.71
Potatoes	bushels	1.24	0.68	----	----
Onions	bushels	----	----	0.98	----
Carrots	dozen bunches	----	0.18	0.23	----
Vegetable price index		131	113	100	195

* Weighted average - the sum of the dollars was divided by the sum of the units.

Since 1929, relative to 1914-28 prices, peas and spinach have sold better than average; cabbage and cauliflower about average; and celery, cabbage, eggplant, and snap beans below average. For example, relative to 1914-28, vegetable prices during 1929-40 were lower by 19 per cent but eggplant prices were lower by 50 per cent. A few vegetables including squash, peppers, and muskmelons actually sold for less in 1941-48 than in 1914-28, even though the prices for all vegetables were 49 per cent higher.

The flood of dollars during the war rapidly raised prices. The big up and down swings in the vegetable price index portray in reverse the changing value of the dollar (figure 6).

The yield index has been independent of the price level (figure 5). Yields were lowest in 1933, not because of the depression but because of a drought.

From Year to Year

Changes in yield from year to year cause changes in price, but in opposite directions. In favorable seasons, vegetable yields increase not only on this farm but on neighboring farms. The increased supply in the city markets lowers prices. In less favorable seasons, yields decrease and prices rise. Since 1914 the yield and price indexes on this farm have moved in opposite directions for 70 per cent of the years.

The changes in price from year to year vary among the vegetables. The price of sweet corn has been the least variable. The price per dozen ears has averaged 23 cents and the variation from year to year, 4 cents. This is a variability of 17 per cent. Sweet corn also has had a low variability in yield. Cabbage too has had a low variability in yield but a high variability in price. The price per bushel of cabbage has averaged 78 cents and the variation from year to year 26 cents.

Among the vegetables, the highest variability in price has occurred in potatoes. The price per bushel has averaged \$1.06 and the variation from year to year, 46 cents, a variability of 43 per cent. Potato yields have also been highly variable. Cauliflower and eggplant have also shown high variability in both yield and price.

Hay and Grain Prices

Prior to 1924 an average of 12 tons of hay were sold per year, but since 1934, none has been sold. Hay raised and fed on the farm has been credited to the hay account and charged to the cattle and horse accounts at market value less cost of marketing.

In 1931 the average price of hay was as low as \$5.21 per ton and in 1945, as high as \$28.00. The difference in price from year to year amounted to \$3.78, 27 per cent of \$13.87, the average price.

Prior to 1932, a majority of the wheat was sold. Since the poultry flock was increased to commercial size, most of the wheat has been fed. In 7 years wheat prices were below \$1.00 per bushel; the lowest being 62 cents in 1932. The price rose from 95 cents in 1941 to \$2.50 in 1947. Prior to this, the highest season's average was \$2.00 per bushel in 1925.

The government fixed wheat prices in both wars and has supported the price of wheat since 1930. This has reduced the variability to 25 cents a bushel, 17 per cent of \$1.43, the average price.

The oats raised have been fed on the farm. In 7 years the price was under 50 cents a bushel. The lowest price, that of 30 cents, occurred in 1932, and the highest, \$1.25 in 1947. The variation in price from year to year averaged 15 cents, 23 per cent of 64 cents, the average price.

Because it had no market value, the silage made from sweet corn stalks and corn was charged to cattle at cost which varied from \$2.00 to \$11.08 a ton, averaging \$5.18 (table 18).

Livestock Prices

Of the products produced by this farmer, eggs from year to year have been the least variable in price. The variation of slightly less than 5 cents a dozen is 14 per cent of 37 cents, the average price. Egg prices increased from 27 cents in 1939 to 60 cents in 1947 and 1948. Egg prices have been supported off and on by the government since 1933.

Only once since 1935 have the pullets at laying age been valued at less than \$1.00. The highest value was \$1.75 in 1947 and 1948.

During the 35 years, 1,030 cattle have been sold from this farm. Of this number, 63 per cent were cows, 22 per cent steers, and 15 per cent heifers. When sold, the cows and heifers averaged \$70 per head and the steers, \$92. Fat stock was sold to the stockyards, and milk cows to dealers or dairymen. The lowest price received was in 1933 when 25 cows averaging 1,100 pounds brought \$31.59 per head. The highest price was for 10 steers in 1948 which sold for \$2,431.57. The variation in price from year to year averaged \$13.80 per head or 19 per cent of \$72.39, the average price (table 19).

The largest number of hogs sold in recent years was 6 in 1944. These hogs averaged 180 pounds and brought \$30 per head. About the same price was received in 1917 when 13 hogs weighing 3,210 pounds sold for 16-1/4 cents live-weight, amounting to \$40.13 per head. The price was down to around 10 cents in 1930 when 5 hogs brought an average of \$17.14 per head. For one-half of the years, either none or not over two hogs were fattened.

When the accounts were started, three colts were on the farm. Another was born in 1915 and a fifth in 1916. King was broke in 1914 and valued at \$200, and Bess in 1917 valued at \$175. The other two were valued at \$150 and \$125 when they were transferred to the horse account. One colt died.

TABLE 18: AVERAGE PRICES OF FRUIT, HAY, GRAIN, AND LIVESTOCK
FOR INDICATED PERIODS, 1914-48
Market Garden Farm

Enterprise	Unit	Average price per unit			
		1914-28	1929-34	1935-40	1941-48
<u>Fruit</u>					
Apples	bushels	\$0.75*	----	----	----
Strawberries	quarts	----	\$0.09	\$0.11	----
Raspberries	pints	----	0.09	0.09	----
<u>Hay and Grain</u>					
Hay	tons	14.51	10.08	8.53	\$20.17
Wheat	bushels	1.68	0.93	1.00	1.76
Oats	bushels	0.68	0.47	0.51	0.81
Corn silage and stalks	tons	----	3.07	4.31	6.99
Corn for grain	bushels	0.86	----	----	0.60
<u>Livestock</u>					
Hens, eggs	per dozen	0.39	0.30	0.29	0.47
Cattle sold	per head	65.03	59.95	66.90	108.29
Pullets raised	per head	----	----	1.01	1.32
Colts raised	per head	162.50	----	----	----
Hogs sold or butchered	per head	27.74	17.14	18.61	31.66

* Ciders not included.

TABLE 19: VARIABILITY OF PRICES, 1914-48
Market Garden Farm

Kind	Number of Years	Unit	Average price per unit*	Change in price from one year to next*	Per cent variation is of the average
Vegetables					
Endive	13	1-1/2 dozen heads	\$ 0.98	\$ 0.16	16
Sweet corn	35	dozen ears	0.23	0.04	17
Beets	20	dozen bunches	0.59	0.10	17
Broccoli	19	8-quart baskets	0.59	0.10	17
Rutabagas	13	bushels	0.69	0.14	20
Kohlrabi	15	dozen bunches	0.57	0.12	21
Celery cabbage	26	dozen heads	0.77	0.19	25
Parsley	19	dozen bunches	0.53	0.13	25
Spinach	35	bushels	0.61	0.15	25
Muskmelon	29	bushels	1.93	0.51	26
Cucumbers	28	bushels	1.55	0.42	27
Tomatoes	35	bushels	1.06	0.29	27
Radishes	20	dozen bunches	0.27	0.08	30
Peas	35	bushels	1.46	0.44	30
Peppers	33	bushels	1.47	0.45	31
Lettuce	35	dozen heads	0.42	0.13	31
Mustard, turnip greens	14	bushels	0.78	0.25	32
Celery	11	dozen stalks	0.98	0.32	33
Squash	26	bushels	1.04	0.34	33
Snap beans	26	bushels	1.98	0.61	31
Cabbage	35	bushels	0.78	0.26	33
Cauliflower	31	bushels	1.20	0.46	38
Eggplant	31	bushels	0.96	0.36	38
Potatoes	22	bushels	1.06	0.46	43
Hay and Grain					
Wheat	31	bushels	1.43	0.25	17
Oats	24	bushels	0.64	0.15	23
Hay	35	tons	13.87	3.78	27
Livestock					
Hens, eggs	35	dozen	0.37	0.05	14
Cattle sold	35	per head	72.39	13.80	19
Hogs sold, slaughtered	22	per head	25.70	5.95	23

* An unweighted average obtained by dividing the sum of the prices by the number of years.

UNIT COSTS

Vegetables

The vegetable cost index rose from 63 in 1914 to 164 in 1929, an increase of 160 per cent (figure 7). 1/ From 1929-34 the costs on the Market Garden Farm dropped a third while prices dropped a half. It was this maladjustment between cost and price that caused the great depression and bankrupted many farmers.

Booms are created by rapidly rising prices. From 1940 to 1943, vegetable prices on this farm about doubled while costs increased a little more than a third. This resulted in the largest dollar profits ever made on this farm. By 1947 costs had caught up with prices. During 1945-48, costs were twice as high as in 1935-40 and 50 per cent higher than in 1925-28.

A comparison of costs at various stages in the price cycle illustrates how costs change with the changing value of the dollar.

With cabbage yielding 370 bushels per acre, the cost increased from 44 cents per bushel before the war (1914) to 84 cents after the war (1922). Cabbage costs declined during the depression to an all-time low of 36 cents in 1935, and they rose after World War II to 93 cents in 1948. Yields per acre were relatively high in 1935 and 1948, averaging 535 and 483 bushels.

Due to the expense of picking, the cost of peas declined relatively little during the depression and rose exceedingly high during World War II. When the pea harvest averaged around 125 bushels per acre, the cost rose from 51 cents in 1914 to \$1.10 in 1921, declined to only 92 cents in 1935 and soared to \$2.19 in 1946.

During the first 10 years, the cost of growing sweet corn almost trebled. With a production of over 700 dozen ears per acre, the cost increased from 7.8 cents in 1914 to 21.5 cents per dozen ears in 1924. Lower yields during the depression tended to keep costs up. With a yield of 467 dozen in 1941, the cost was 15.2 cents. With a yield of 485 dozen, the cost had risen in 1948 to 35.5 cents.

Costs for each vegetable are averaged by periods of years in table 20 and for the other farm products in table 21. Costs were higher in 1941-48 than in 1914-28 for all of the vegetables except cauliflower. In the earlier years usually less than an acre of cauliflower was grown and for

1/ The cost index for each year was calculated by multiplying for each crop the units produced by the 1935-40 unit costs. The sum of the costs for a given year were divided by what the costs would have been during 1935-40 and the quotient multiplied by 100.

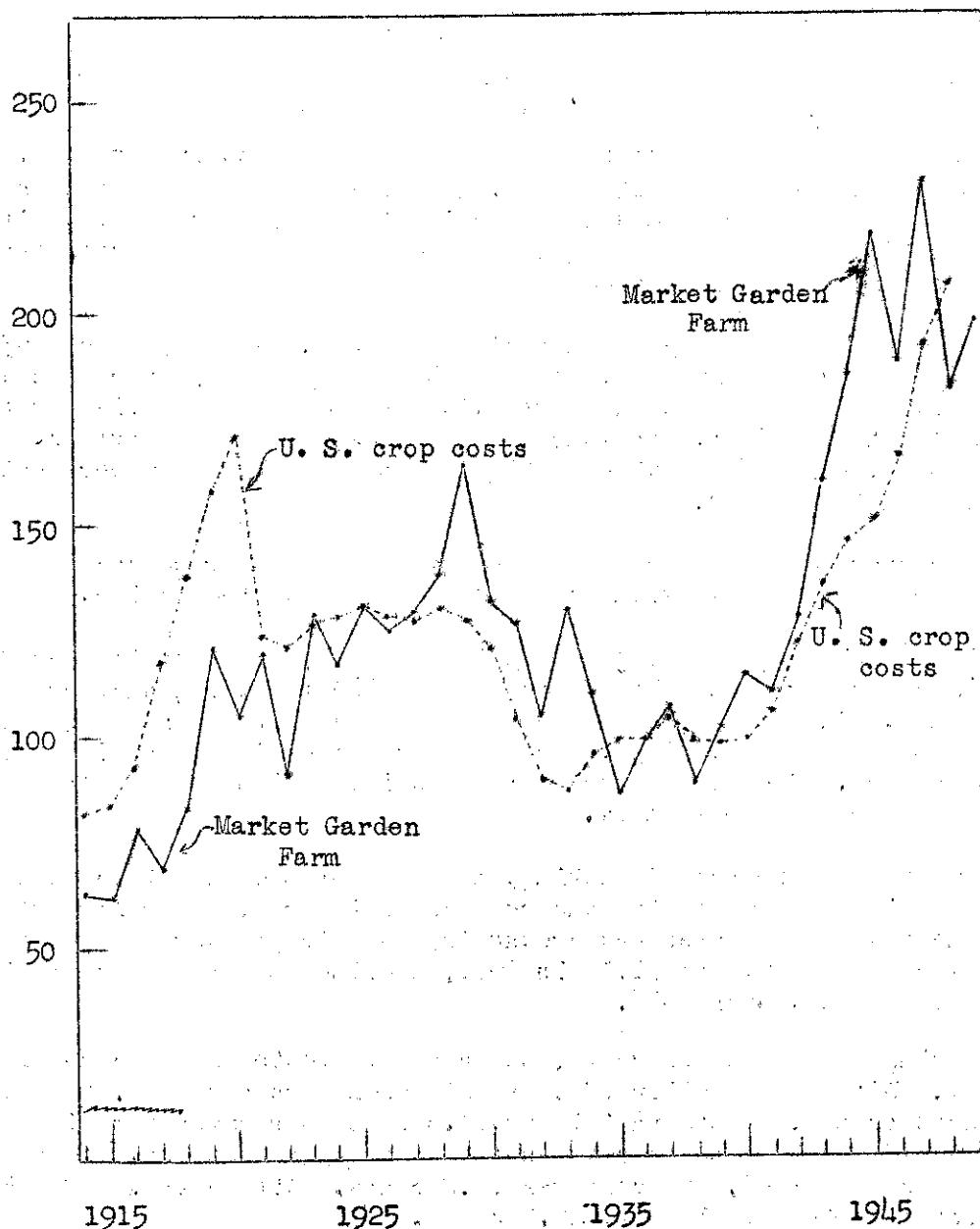


Figure 7.—INDEX NUMBERS - COST OF PRODUCING VEGETABLES ON THE MARKET GARDEN FARM AND UNITED STATES CROP COSTS ^{1/}

The vegetable cost index on the Market Garden Farm usually moved up one year and down the next following inversely the changes in the yields per acre. When the yields increase, the costs per unit decrease and vice versa.

Over a period of years costs on the Market Garden Farm and the prices paid by United States farmers for supplies, articles, interest, taxes, and labor have moved together following the general pattern created by the changing value of the dollar. Compared to the United States index, costs on the Market Garden Farm were relatively low in World War I and high in World War II.

^{1/} Bureau of Agricultural Economics, United States Dept. of Agric.

TABLE 20: VEGETABLES, UNIT COSTS BY PERIODS, 1914-48
Market Garden Farm

Kind	Unit	Average cost per unit*			Relative cost	
		1914-28	1929-40	1941-48	1929-40 when 1914-48 = 100	1941-48 when 1929-40 = 100
Cauliflower	bushels	\$1.18	\$0.62	\$1.06	53	171
Muskmelon	bushels	1.26	0.91	1.40	72	154
Cabbage	bushels	0.57	0.49	0.77	86	157
Squash	bushels	0.71	0.57	1.08	80	189
Peppers	bushels	0.96	1.19	1.43	124	120
Sweet corn	dozen ears	0.17	0.16	0.27	94	169
Cucumbers	bushels	0.86	1.09	1.31	127	120
Spinach	bushels	0.44	0.40	0.72	91	180
Eggplant	bushels	0.57	0.74	0.94	130	127
Tomatoes	bushels	0.58	0.78	0.96	134	123
Peas	bushels	0.87	1.15	1.66	132	144
Lettuce	dozen heads	0.20	0.21	0.43	105	205
Celery cabbage	dozen heads	0.49	0.44	1.16	90	264
Radishes	dozen bunches	0.15	0.18	0.40	120	222
Potatoes	bushels	0.94	----	----	---	---
Carrots	dozen bunches	----	0.26	----	---	---
Rutabagas	bushels	----	0.68	0.87	---	128
Snap beans	bushels	----	1.20**	2.08	---	173
Chard	dozen bunches	----	0.56	1.03	---	184
Mustard, turnip greens	bushels	----	0.33	0.63	---	191
Broccoli	8-quart basket	----	0.37	0.74	---	200
Celery	dozen stalks	----	0.46	0.96	---	209
Beets	dozen bunches	----	0.44	0.94	---	214
Endive	1-1/2 dozen heads	----	0.43	1.04	---	242
Kohlrabi	dozen bunches	----	0.56	1.78	---	318
Parsley	dozen bunches	----	0.22	0.73	---	332
Vegetable cost index		104	114	175	110	154

* Average weighted by units.

** Years 1926-1940

TABLE 21: FRUIT, HAY, GRAIN, AND LIVESTOCK, UNIT COSTS BY PERIODS, 1914-48
Market Garden Farm

Item	Unit	Average cost per unit*			Relative cost	
		1914-28	1929-40	1941-48	1929-40	1941-48
		when 1914-28 = 100	when 1929-40 = 100			
<u>Fruit</u>						
Apples	bushels	\$ 0.74**	----	----	---	---
Strawberries	quarts	----	\$ 0.08	----	---	---
Raspberries	pints	----	0.09	----	---	---
<u>Hay and Grain</u>						
Wheat	bushels	1.52	1.36	\$ 2.01	89	148
Hay	tons	15.35	19.24	27.47	125	143
Oats	bushels	0.68	0.79	1.32	116	167
Corn silage and stalks	tons	----	3.78	6.99	---	185
Corn for grain	bushels	1.09	----	1.04	---	---
<u>Livestock</u>						
Pullets	per head	----	1.38	1.74	---	126
Eggs	dozen	0.39	0.35	0.48	90	137
Cattle	per head	81.22	79.68	143.47	98	180
Hogs	per head	26.09	25.27	41.72	97	165
Colts	per head	419.62	----	----	---	---

* Average weighted by units.

** Apples other than ciders.

three-fourths of the time, the yield per acre was less than 200 bushels. The average yield from 1941-48 was 345 bushels.

Muskmelons, from 1922 to 1933, yielded about 200 bushels per acre and, with one exception, the cost each year exceeded a dollar a bushel, averaging \$1.46. But for the next six years, from 1934-39, the average yield exceeded 300 bushels, and each year the cost was less than \$1.00, averaging 77 cents.

Thus, the costs of cauliflower, muskmelons, and cabbage were relatively low from 1929-40, while peas, tomatoes, and eggplant were relatively high (table 20).

Hay and Grain

On cost account farms, in years when wheat yielded 21 or 22 bushels per acre, the cost per bushel increased from \$1.13 in 1914 to \$2.25 in 1921, and declined to 91 cents in 1934. With a yield of 33 bushels, the cost rose from 76 cents in 1938 to 93 cents in 1945.

During the last boom, the combine was in general use and the cost per bushel was therefore not as high as in World War I. On the cost account farms the hours of labor per acre of wheat have decreased from 22 in 1914 to 20 in 1921 to 13 in 1934, and to 9 in 1948. Then too, on the cost account farms during the past 30 years, the yield has increased 6 bushels per acre, an increase of 27 per cent.

In the earlier years, the cost of producing a bushel of wheat on the Market Garden Farm was comparable to the cost on other cost account farms. Prior to 1929, in 6 years out of 11, the cost on this farm was below average. But since 1930 costs have exceeded the average by 40 cents or more per bushel in 15 years and by more than a dollar in 5 years. The difference was not due to yields, for since 1930 the production on this farm and on all cost account farms averaged the same, 28 bushels per acre.

However, costs are usually higher where the acreage is small. In 7 years since 1930 the acreage in wheat on the Market Garden Farm has been less than 5 and not until 1944 did the acreage amount to 10.

The wheat was threshed until 1945 when the harvesting was done by a hired combine and baler. From 1945 to 1948 \$283 was paid for combining 1,217 bushels, and \$397 for baling 35.7 tons of straw. This was at the rate of 23 cents per bushel and \$11.12 per ton. The straw was credited to the wheat account at \$19.97 per ton. The high cost of 23 cents per bushel for combining was partly due to the yield of only 10 bushels per acre from 20 acres in 1948.

In the production of hay as well as grain, the Market Gardener is at a greater disadvantage now than he was 20 years ago. He does not grow sufficient acreage to own a combine and baler.

Before 1932 the cost of producing a ton of hay on this farm was lower than the average in 8 years and higher in 10, but after 1932, the cost was higher every year. For the past 17 years the cost has averaged \$22 per ton, \$10 above the average. The yields, however, have been slightly better than average.

The Market Gardener raises vegetables of high acre value and his overhead and ways of doing are likely to be too costly to grow grain and hay profitably.

Poultry

Since 1935 the cost of producing eggs on the cost account farms has varied from 25 cents in 1939, an all-time low, to 51 cents in 1948, an all-time high. The average was 34 cents. On the Market Garden Farm, the average cost was 10 cents a dozen higher. The Market Garden hens laid fewer eggs which largely accounted for the higher cost. From 1935 to 1942 they averaged 149 eggs per year which was 1/2 dozen short of the average production per hen on the cost account farms. The cost on the Market Garden Farm was 34 cents per dozen or 7 cents above the average.

But the Market Garden hens have not done so well since. From 1943 to 1948 they laid only 129 eggs per year while the cost account average was 178. During the past six years the eggs on the Market Garden Farm cost 58 cents a dozen and sold for 51 cents, a loss of 7 cents. The average of all hen accounts showed a cost of 42.7 cents, a price of 49.5, and a gain of 6.8 cents per dozen.

The largest amount of work with poultry is in raising chickens. The most work on hens also comes in the spring when there are the most eggs to clean and pack. This seriously interferes with other spring work. Commercial poultry flocks are more common on dairy than on market garden farms.

PROFITS

Total, Per Cost Dollar

On the Market Garden Farm, lettuce ranked first in total profits and among the major vegetables, first in the size of profit relative to cost. In 35 years \$87,619 worth of lettuce was sold from this farm. The cost to produce this lettuce came to \$52,457, leaving a profit of \$35,162. The rate of profit was 67 cents for each dollar of expense (table 22). This is referred to as "profit per cost dollar".

Tomatoes, with a profit of \$21,052, ranked second in total profit. The "profit per cost dollar" was 44 cents.

The total profit from peas was nearly as large as that from tomatoes, but the expenses were greater, leaving a "profit per cost dollar" of only 35 cents. The average "profit per cost dollar" for all vegetables was 33 cents.

Muskmelons were grown in 29 of the 35 years and the profit of \$18,005 was about the same as that from sweet corn. The "profit per cost dollar" was 56 and 26 cents respectively.

The profit from cabbage amounted to \$14,128 and from cauliflower \$12,773. The "profit per cost dollar" was 30 cents and 37 cents.

These seven were the only vegetables with profits in five figures. They accounted for 56 per cent of the labor spent on vegetables and for 78 per cent of the profits.

If fruit, hay, grain, and livestock are included, then the seven vegetables used less than half of the labor and accounted for 99 per cent of the profit. The hay and grain crops showed a loss of \$8,578 and the livestock a loss of \$30,712. These losses were equal to a fifth of the profits made from vegetables.

Profits have varied through the years (tables 22, 23). They were usually high in the war and post-war years and low or non-existent in the depression years. Lettuce, cauliflower, sweet corn, and cucumbers were most profitable in the last war period (1941-48). Accordingly, these crops have been increased. The proportion of the total hours spent on lettuce, cauliflower, and cucumbers has been increased from 6.6 per cent in 1914-28 to 13 per cent in 1941-48 (table 11). The relative time spent on sweet corn has been decreased, but the acreage has been increased.

On the other hand, eggplant, peas, and peppers were most profitable in the first war period (1914-28). Consequently, the proportion of the hours spent on peas has been decreased from 29.5 per cent in 1914-28 to 8.8 per cent in 1941-48, and eggplant from 2.2 to 0.3 per cent. Peppers, however, are being tried out on a larger acreage and the percentage of hours spent on them has increased from 0.8 to 3.4.

Per Hour

If the total profit of \$18,005 from muskmelon is divided by 16,506 hours, the total time spent on the crop, the quotient of \$1.09 is the profit per hour.

Melons paid for the use of the land, for horse and tractor work, for plants, irrigation water, labor, and for interest on these costs for the time the money was invested, and all other costs, and returned a profit of \$1.09 for each hour of labor spent directly on the melon crop (table 24).

TABLE 22: VEGETABLES, UNIT PROFIT BY PERIODS,
PROFIT PER DOLLAR COST, 1914-48
Market Garden Farm

Crop	Unit	Average profit per unit				Profit
		1914-28	1929-40	1941-48	1914-48	per dollar
		15 years	12 years	8 years	35 years	cost
						1914-48
						35 years
Major vegetables						
Lettuce	dozen heads	\$0.15	\$0.08	\$0.33	\$0.19	\$0.67
Muskmelon	bushels	1.09	0.25	0.86	0.67	0.56
Eggplant	bushels	0.53	0.17	0.27	0.33	0.51
Tomatoes	bushels	0.33	0.17	0.43	0.37	0.44
Cauliflower	bushels	0.05	0.13	0.48	0.34	0.37
Peas	bushels	0.46	0.04	0.29	0.37	0.35
Cabbage	bushels	0.15	0.09	0.28	0.19	0.30
Beans, snap	bushels	0.54	0.26**	0.62	0.50	0.29
Potatoes	bushels	0.30	-1.10	----	0.26	0.27
Sweet corn	dozen ears	0.04	0.00	0.11	0.05	0.26
Endive	1-1/2 dozen heads	----	0.16	0.18	0.18	0.22
Celery	dozen bunches	----	0.06	0.19	0.18	0.20
Spinach	bushels	0.13	0.04	0.11	0.09	0.17
Peppers	bushels	0.76	-0.23	0.23	0.20	0.15
Beets	dozen bunches	----	-0.03	-0.15	-0.08	-0.13
Minor vegetables						
Cucumbers	bushels	0.33	0.04	1.26	0.88	0.74
Mustard, turnip greens	bushels	----	0.19	0.38	0.34	0.61
Celery cabbage	dozen heads	0.34	0.10	-0.23	0.18	0.35
Chicory	bushels	----	0.11	----	0.11	0.34
Parsley	dozen bunches	----	0.16	0.00	0.09	0.19
Squash	bushels	0.50	0.18	0.11	0.15	0.18
Broccoli	8-quart baskets	----	0.01	0.02	0.02	0.03
Rutabagas	bushels	----	0.02*	----	0.02	0.03
Radishes	dozen bunches	-0.03	-0.02	-0.03	-0.02	-0.07
Chard	bushels	----	-0.08	-0.06	-0.06	-0.07
Carrots	dozen bunches	----	-0.04	----	-0.04	-0.17
Onions	bushels	----	-0.22	***	-0.66	-0.40
Kohlrabi	dozen bunches	----	-0.09	-1.06	-0.39	-0.42
Average, all vegetables						0.33

* 1930-42

** 1926-40

***Crop failures

TABLE 23: FRUIT, HAY, GRAIN, AND LIVESTOCK,
PROFITS PER UNIT BY PERIODS, 1914-48
Market Garden Farm

Kind	Unit	Average profit per unit				Profit
		1914-28	1929-40	1941-48	1914-48	per dollar
		15 years	12 years	8 years	35 years	cost
						1914-48
						35 years
<hr/>						
Fruit						
Strawberries	quarts	----	\$ 0.03	----	\$ 0.03	\$ 0.35
Apples	bushels	\$ 0.01	----	----	0.01	-0.01
Raspberries	pints	----	0.00	----	0.00	-0.04
Average, fruit						0.15
Hay and Grain						
Corn, stalks,						
silage	tons	----	0.14	\$ 0.00	0.06	0.01
Wheat	bushels	0.16	-0.40	-0.25	-0.18	-0.11
Oats	bushels	0.00	-0.31	-0.51	-0.20	-0.23
Hay	tons	-0.84	-9.90	-7.30	-4.65	-0.24
Corn for grain	bushels	-0.23	----	-0.44	-0.32	-0.30
Average, hay and grain						-0.18
Livestock						
Hogs	per head	1.65	-7.05	-10.06	-0.48	-0.02
Hens, eggs	per dozen	0.00	-0.05	-0.01	-0.03	-0.07
Cattle	per head	-16.19	-16.33	-35.18	-20.77	-0.22
Pullets	per head	----	-0.39	-0.42	-0.41	-0.25
Colts	per head	-257.12	----	----	-257.12	-0.61
Average, livestock						-0.18
Average, all enterprises						0.18

TABLE 24: VEGETABLES, PROFIT PER HOUR OF LABOR
BY INDICATED PERIODS, 1914-48
Market Garden Farm

Crop	Average profit per hour*				
	1914-28 15 years	1929-34 6 years	1935-40 6 years	1941-48 8 years	1914-48 35 years
Major vegetables					
Muskmelon	\$1.73	\$0.22	\$0.45	\$1.49	\$1.09
Lettuce	0.97	0.25	0.45	1.65	1.06
Eggplant	1.41	-0.31	-0.37	0.73	0.81
Cabbage	0.46	-0.23	0.65	1.14	0.69
Tomatoes	0.59	0.02	0.29	0.77	0.62
Cauliflower	0.05	-0.08	0.25	0.97	0.59
Sweet corn	0.39	0.08	-0.06	1.03	0.42
Potatoes	0.40	-1.04	-0.82	----	0.32
Peppers	1.01	-0.50	-0.13	0.41	0.30
Spinach	0.41	0.06	0.17	0.36	0.26
Celery	----	----	0.07	0.27	0.25
Peas	0.32	-0.05	0.11	0.17	0.24
Beans, snap	0.34	0.12	0.11	0.30	0.23
Endive	----	----	0.19	0.19	0.19
Greenhouse	-0.14	0.27	0.44	0.19	0.17
Beets	----	0.28	-0.15	-0.25	-0.16
Minor vegetables					
Mustard, turnip greens	----	0.95	0.72	1.27	1.16
Cucumbers	0.35	-0.73	0.30	1.96	1.14
Chicory	----	-0.23	0.26	1.16	0.40
Celery cabbage	0.72	-0.02	0.24	-0.24	0.33
Squash	1.04	0.40	0.39	0.20	0.31
Rutabagas	----	0.02	0.14	-0.28	0.05
Parsley	----	0.35	0.36	0.01	0.18
Broccoli	----	-0.35	0.12	0.06	0.05
Radishes	-0.08	-0.32	0.06	-0.07	-0.06
Chard	----	----	-0.22	-0.08	-0.10
Carrots	----	-0.53	0.01	----	-0.11
Onions	-0.31	----	-0.09	-1.61	-0.25
Kohlrabi	----	-0.01	-0.70	-0.89	-0.70
All vegetables	0.44	0.04	0.22	0.57	0.42

* Averages weighted; the total profit divided by the total hours.

In the cost account reports "returns per hour" have been used to measure the relative returns by enterprises. If to the profit of \$1.09 per hour is added 51 cents, the cost of an hour of labor, then melons paid all costs except labor and returned \$1.60 per hour. The comparisons given in tables 24 and 25 show the profit per hour and not the return. In only five years were melons grown at a loss (table 26). In a few years the profits have been unusually high, exceeding \$3.00 per hour in 1921, 1928, 1943, and 1947.

Although the total profit from lettuce was much larger than from melons, lettuce required more labor and the "profit per hour" was 3 cents lower. In only three years, 1914, 1915, and 1929 was lettuce grown at a loss. The profit per hour exceeded \$2.00 in 1923, 1927, 1945, and 1948 but never quite reached \$3.00.

On the average, eggplant has paid well, returning a profit of 81 cents per hour, but most of the profitable years occurred prior to 1929. From 1929 to 1942, eggplant was produced at a loss in every year but one. For that reason, it was not grown from 1943 to 1946. In 1947 an acre and in 1948 an acre and a half were set and paid well, returning a profit of over \$1.00 an hour.

Cabbage has shown a profit of 69 cents per hour. Only five vegetables have paid better, but the profits have fluctuated violently. For example, in 1946 cabbage showed a loss of \$782 and the next year a profit of \$3,788. This was a loss of 65 cents an hour and a profit of \$3.67.

Tomatoes have paid within 7 cents an hour as well as cabbage, and the profits have fluctuated less violently. The surplus tomatoes that could not be sold for market have usually been sold to the canning factory. In only two years, 1924 and 1945, did the profit from tomatoes amount to as much as \$1.00 per hour. This crop, however, has been grown at a profit in every year but 1930, 1931, 1934, and 1938.

With the exception of mustard - turnip greens, every other enterprise has shown a loss in one or more years (tables 26, 27). Potatoes made a loss in 11 years and a profit in 11. In the last six years that potatoes were grown, less than an acre was usually planted, and were relatively unimportant.

The vegetables on this farm that have more frequently shown a loss than a profit are: beets, radishes, chard, carrots, onions, and kohlrabi.

Usually, half an acre has been planted to beets. The plants are grown in the greenhouse and are transplanted to the field during the last of March and the first of April. In 1949 the beets were charged \$333.90 for 47,700 plants. The beet account that year showed a loss of \$337.95. Since 1937 beets have been grown at a loss in every year but two.

The other crops that have been most often grown at a loss are of little importance. The radishes produced are not as bright as desired and the carrots, because of stones, are not shaped so well as those grown on the muck or sand.

TABLE 25: FRUIT, HAY, GRAIN, AND LIVESTOCK,
PROFIT PER HOUR OF LABOR BY INDICATED PERIODS, 1914-48
Market Garden Farm

Enterprise	Average profit per hour*				
	1914-28 15 years	1929-34 6 years	1935-40 6 years	1941-48 8 years	1914-48 35 years
Fruit					
Strawberries	----	\$0.14	\$0.21	\$0.32	\$0.22
Apples	\$0.01	-0.26	----	----	-0.01
Raspberries	----	-0.05	-0.01	----	-0.02
Hay and Grain					
Corn for silage, fodder	0.00	0.17	0.00	0.00	0.02
Corn for grain	-0.09	----	----	-0.83	-0.21
Wheat	0.18	-0.60	-0.64	-0.61	-0.29
Oats	0.01	-0.86	-0.79	-1.23	-0.47
Hay	-0.15	-1.56	-1.28	-1.73	-0.82
All hay and grain	-0.05	-0.92	-0.66	-0.79	-0.46
Livestock					
Hogs	0.09	-0.42	-0.07	-0.45	-0.02
Hens	0.00	-0.21	-0.31	-0.16	-0.17
Cattle	-0.39	-0.61	-0.45	-1.03	-0.57
Chicks	----	-0.47	-0.53	-0.93	-0.77
Colts	-0.97	----	----	----	-0.97
All livestock	-0.32	-0.46	-0.40	-0.65	-0.46
All enterprises	0.30	-0.08	0.12	0.41	0.27

* Averages weighted; the total profit divided by the total hours.

TABLE 26: VEGETABLES, PROFIT PER HOUR FREQUENCY, 1914-48
Market Garden Farm

Crop	Number of years	Number of years the loss or profit per hour was within indicated interval							
		Loss (cents)			Profit (cents)				
		100 and more	50 - 99	0 - 49	1 - 49	50 - 99	100 - 199	200 and more	
Major vegetables									
Muskmelon	29	0	1	4	5	7	6	6	
Lettuce	35	0	0	3	9	10	9	4	
Eggplant	31	1	6	6	3	5	8	2	
Cabbage	35	1	2	8	9	5	7	3	
Tomatoes	35	0	2	2	15	14	2	0	
Cauliflower	31	2	2	5	7	11	3	1	
Sweet corn	35	1	2	6	12	11	3	0	
Potatoes	22	2	6	3	4	1	5	1	
Peppers	33	1	6	6	7	7	5	1	
Spinach	35	0	1	8	16	5	5	0	
Celery	11	0	1	0	8	2	0	0	
Peas	35	0	1	10	20	3	1	0	
Beans, snap	26	0	0	3	21	2	0	0	
Endive	13	0	0	3	8	2	0	0	
Greenhouse	35	0	2	14	14	5	0	0	
Beets	20	0	1	11	6	1	1	0	
Minor vegetables									
Mustard, turnip greens	14	0	0	0	5	4	2	3	
Cucumbers	29	4	2	4	11	3	1	4	
Chicory	9	3	0	0	2	3	0	1	
Celery cabbage	27	2	1	7	6	6	4	1	
Squash	28	2	2	4	10	7	1	2	
Rutabagas	13	2	2	4	2	1	2	0	
Parsley	19	1	0	3	10	4	1	0	
Broccoli	19	2	2	4	7	3	1	0	
Radishes	21	1	1	11	7	0	1	0	
Chard	10	0	2	5	2	1	0	0	
Carrots	11	2	1	6	2	0	0	0	
Onions	7	2	1	1	3	0	0	0	
Kohlrabi	14	3	3	5	2	1	0	0	
Total, vegetables	682	32	50	146	233	124	68	29	
Per cent of total	100	5	7	22	34	18	10	4	

TABLE 27: FRUIT, HAY, GRAIN, AND LIVESTOCK
 PROFIT PER HOUR FREQUENCY, 1914-48
 Market Garden Farm

Enterprise	Number of years	Number of years the loss or profit per hour was within indicated interval							
		Loss (cents)			Profit (cents)				
		100	50	0	1	50	100	200	
		and more	- 99	- 49	- 49	- 99	- 199	and more	
Fruit									
Strawberries	14	0	1	5	2	4	2	0	
Raspberries	9	1	0	5	3	0	0	0	
Apples	16	5	2	2	5	2	0	0	
Hay and Grain									
Hay	35	18	7	4	2	2	2	0	
Corn for grain	8	0	3	3	2	0	0	0	
Corn silage	18	0	0	17	0	1	0	0	
Oats	23	7	7	4	1	2	1	1	
Wheat	31	7	4	8	6	4	1	1	
Livestock									
Cattle	35	5	13	16	1	0	0	0	
Hens	35	2	4	14	13	2	0	0	
Hogs	25	0	4	12	9	0	0	0	
Chicks	15	5	2	6	2	0	0	0	
Colts	10	5	3	2	0	0	0	0	
Total, hay, grain and livestock									
	235	49	47	86	36	11	4	2	
Per cent of total									
	100	21	20	37	15	4	2	1	

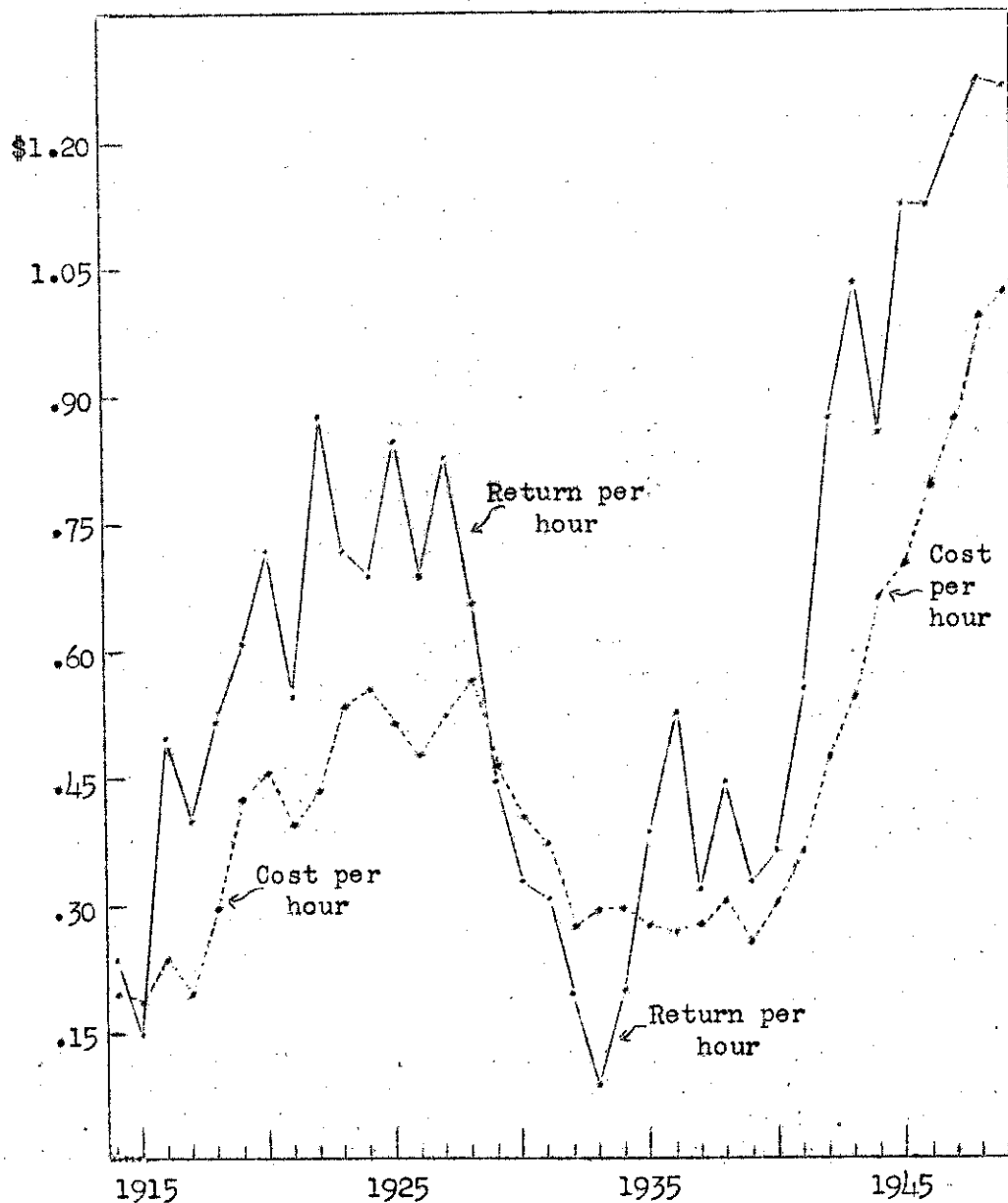


Figure 8: COST AND RETURN PER HOUR OF LABOR, 1914-48
Market Garden Farm

Because of the rapid rise in prices during the early forties, the biggest spread between the cost and the return of an hour of labor was 49 cents in 1943. By 1949 the profit had narrowed to 24 cents. Costs were up 48 cents, but returns were only 23 cents higher than in 1943.

When prices fall the returns fall faster than cost. From 1927-33 labor costs decreased from 53 cents to 30 cents an hour, but returns fell from 83 cents to 9 cents.

LABOR REQUIREMENTS

Seasonal Distribution

The amount of time, by months, spent on vegetables during 1945 and 1947 is summarized in table 28 and how this time compares with that spent on other enterprises is shown in table 29.

To do the livestock chores and haul the manure required 433 hours in January which was more than half of all the hours worked during the month. Repairs on the operators' house took over 100 hours and 78 hours were classified as work on vegetables. The work on vegetables included 27 hours, painting and repairing irrigation equipment - pumps and oscillators, 24 hours painting and repairing sash used in the flat bed, and 27 hours hauling and storing boxes (table 28).

Fire in the greenhouse was started February 8th in 1945, and January 30th in 1947.

In February, 26 per cent more hours were worked than in January. In the greenhouse, 539 hours were spent painting, mixing dirt, sterilizing soil, sowing seeds, and transplanting seedlings.

In March, 60 per cent more work was done than in February. More plants were started, some were moved to the flat bed, more manure was hauled, and the weather permitted 186 hours of plowing, sowing, and planting.

The next month the field work amounted to nearly 1,000 hours, and the total hours worked in April exceeded the March total by 40 per cent. The most time-consuming job was transplanting beets, chard, lettuce, parsley, broccoli, and cabbage from greenhouse or flat bed to the field. As soon as the land could be fitted, radishes, mustard-turnip greens, spinach, and peas were sown. This was also the month of maximum work in the greenhouse. Most of the cattle had been sold by April 1st, and compared with the preceding month, 200 fewer hours were spent on chores and manure.

The pressure of work continued through May when 27 per cent more hours were worked than in April. In 1945 harvesting began in early May, and during the month, 331 hours were spent cutting and washing spinach, and 297 hours harvesting mustard-turnip greens, radishes, parsley, and lettuce. In 1947 the harvesting of these vegetables started two weeks later. The maximum work on growing the vegetables came in May. The cultivating, hoeing, and thinning of lettuce during the month took 404 hours in 1945 and 344 in 1947. During May there was some work done on every vegetable grown except endive. About 150 hours were spent on cabbage, and about the same amount on melons and tomatoes.

TABLE 28: HOURS OF LABOR BY MONTHS, ON VEGETABLES
AVERAGE PER YEAR, 1945, 1947
Market Garden Farm

Month	Direct to vegetables			Irri- gating	Growing plants	Other*	Total
	Grow- ing	Har- vesting	Pea and bean pickers				
January				27	24	27	78
February				1	539	30	570
March	186			11	691	34	922
April	942			36	748	39	1,765
May	1,417	411		78	273	109	2,288
June	1,318	1,558	1,107	126	38	269	4,416
July	742	1,669	1,950	181	28	296	4,866
August	515	2,225	37	186	23	315	3,301
September	201	1,894	135	86	141	308	2,765
October	5	1,916		68	104	224	2,317
November	1	1,151		48	156	159	1,515
December		385			68	88	541
Total	5,327	11,209	3,229	848	2,833	1,898	25,344
Per cent of total	21	44	13	3	11	8	100

* Other labor includes work on containers, marketing, transporting pickers, etc.

TABLE 29: HOURS OF LABOR ON VEGETABLES, HAY AND GRAIN,
LIVESTOCK, AND MAINTAINANCE OF EQUIPMENT, BUILDINGS, ETC.
AVERAGE PER YEAR, 1945, 1947
Market Garden Farm

Month	Vege- tables	Hay and grain	Livestock and manure	Repairs, buildings, equipment	Cropland, woods, general	Total
January	78		433	174	79	764
February	570		323	54	20	967
March	922	9	485	68	57	1,541
April	1,765	42	263	56	24	2,150
May	2,288	18	282	93	52	2,733
June	4,416	24	219	30	26	4,715
July	4,866	109	167	8	39	5,189
August	3,301	113	185	6	17	3,622
September	2,765	113	178	17	8	3,081
October	2,317	21	310	25	19	2,692
November	1,515		347	43	70	1,975
December	541		385	79	8	1,013
Total	25,344	449	3,577	653	419	30,442

PERCENTAGE BY MONTHS

January	10		57	23	10	100
February	59		33	6	2	100
March	60	1	31	4	4	100
April	82	2	12	3	1	100
May	84	1	10	3	2	100
June	94	*	5	1	*	100
July	94	2	3	*	1	100
August	91	3	5	*	*	100
September	90	4	6	*	*	100
October	86	1	11	1	1	100
November	77		18	2	3	100
December	53		38	8	1	100
For year	83	2	12	2	1	100

* Less than 0.5 per cent

Within 100 hours as much work was done on growing vegetables in June as in May. It took nearly 200 hours in June to plant, cultivate, and dust celery. About the same amount of time was spent on melons and also on peppers. Sweet corn was still being planted in June and with the cultivating, hoeing, and dusting, more than 100 hours were spent on this crop.

Because of increased harvesting, about twice as many hours were worked in June as in May. Over 300 hours were used in pulling, washing, and bunching beets, and almost 500 hours in cutting and packing lettuce. The time of the pea picking crew was estimated at 1,107 hours, but the time of special crews used in picking peas and beans was not included in the labor charted in figure 9. The other vegetables marketed in June included broccoli, cabbage, chard, early cauliflower, kohlrabi, greens, parsley, spinach, and radishes.

If the labor of the special crews hired to pick peas and string beans is included, then July was the only month when the total hours worked exceeded 5,000 (table 29). Sowing, thinning, and hoeing endive and planting, hoeing, and cultivating celery come in July. In this month in 1947 307 hours were spent on celery, over 500 hours were required to harvest the lettuce, over 400 hours to harvest cauliflower, and more than 300 hours to harvest cabbage.

Excluding the pea and bean pickers, the maximum amount of harvest work occurred in August. In this month, over 800 hours were spent picking tomatoes, over 500 hours picking sweet corn, and 200 hours picking beans. In August, as well as in July, approximately 180 hours were spent moving pipe lines and doing other irrigation work. The work on growing vegetables in August consisted primarily in hoeing and dusting celery, and caring for the second crops of broccoli, cauliflower, lettuce, and spinach.

The hours worked in September were 19 per cent fewer than in August. Only about 200 hours were spent hoeing, cultivating, and dusting, primarily on celery and endive. By September the bulk of the tomatoes and sweet corn had been picked. However, more time than in the preceding month was used in harvesting melons and peppers and in bleaching and harvesting celery and endive.

In October, one-half of all the work on vegetables was on celery and endive. The other vegetables marketed included: late cauliflower, spinach, peppers, lettuce, squash, parsley, cabbage, tomatoes, and broccoli. About the same amount of work was done in October as in May, approximately 2,700 hours.

The hours worked declined to 1,975 in November which was comparable to the time worked in April. As many hours were spent on celery and cabbage in November as in October, but less work was done in harvesting other vegetables.

In December, the remainder of the celery crop was marketed.

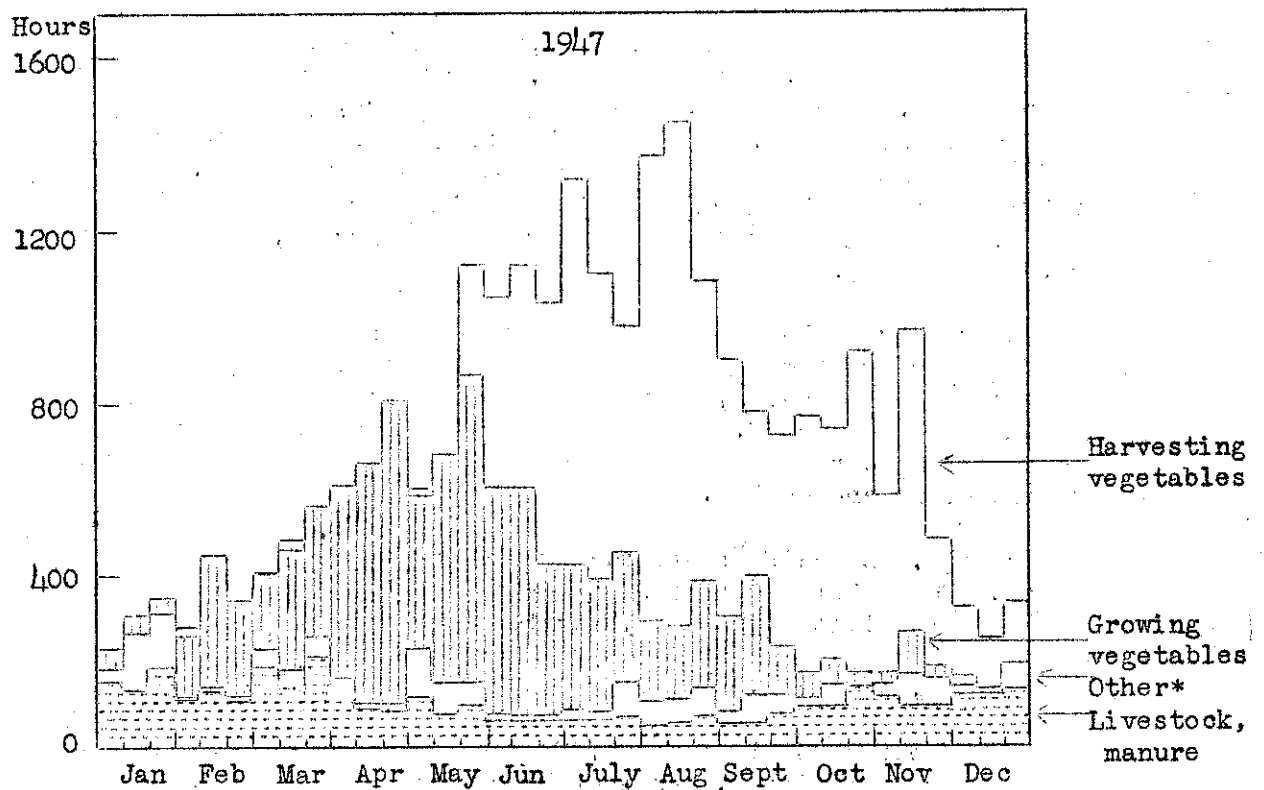
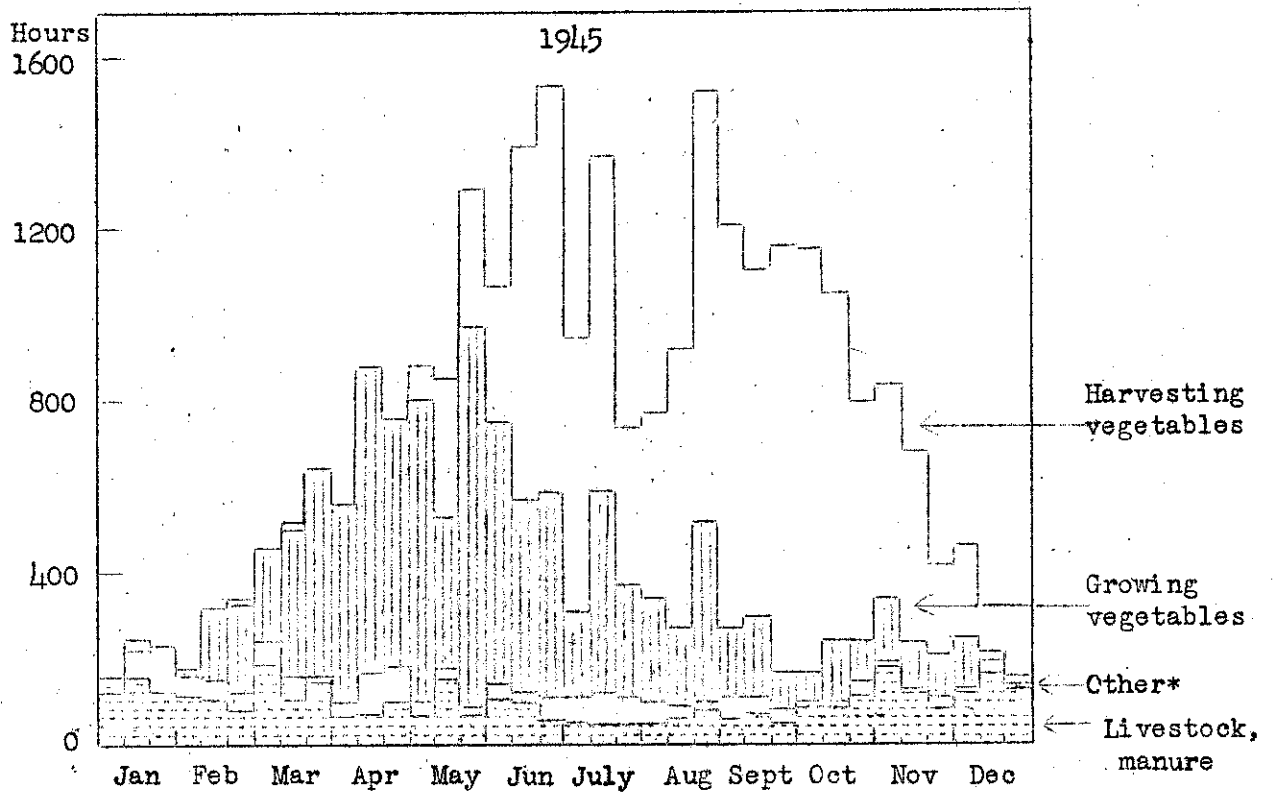


Figure 9: HOURS OF LABOR BY 10-DAYS PERIODS, 1945 AND 1947
Market Garden Farm

The labor distribution for each year follows the same general pattern. However, the hours worked for the same 10-days period often vary. These differences are largely due to differences in the weather.

* Includes buildings and equipment, hay and grain.

The Market Gardener attempts to plant and sow the different vegetables in such proportions as to return maximum profit. To do this, he plants each vegetable at such time and in such quantity that he thinks will best meet the market demand and supply steady work for his regular farm help. High-priced labor should have work comparable to their wage, work requiring special skills and knowledge, such as selling produce, sowing seeds, operating machinery, supervising labor, etc. Cheaper labor, costing half as much per hour can be used for weeding, thinning, transplanting, washing, bunching, and picking.

A glance at figure 9 shows that the labor was distributed more uniformly in 1947 than in 1945. This was, in part, due to the weather. August, 1947 was hot. The weather station at Buffalo reported an average temperature of 75.2° which was 6.8° above the normal for August. In that year, all of the tomatoes were harvested on this farm by August 29th. This resulted in a more uniform distribution of labor through August than was possible in 1945 when the harvesting continued into October and 86 per cent of the tomatoes were harvested after August 20th.

Hours Per Acre

As grown on this farm, beets have required the most labor per unit of area. Since 1941 about half an acre has been used for beets, on which has been transplanted around 60,000 beets and some seed sown for beet greens. On an average, 236 hours have been spent growing the beets, and 342 hours pulling and bunching them. This was equivalent to 1,156 hours per acre which was about 50 per cent more than the average given in table 30. In the earlier years, more seed and less transplants were used.

A second crop of spinach has been sown, usually in August. Recently, most of the spinach has been sold to processors for prepackaging. For the processors, the grower harvests the spinach by clipping and does not wash it. The varieties grown have been Blight Resistant, Long Standing, and Long Standing Savoy. About 150 hours per acre have been used in growing and harvesting spinach.

Approximately the same time per acre was spent on mustard and turnip greens. The greens were clipped, washed, and sold by the bushel. More than twice as much labor was involved in pulling, washing, and bunching radishes as in growing greens.

In 1949, 482 hours were spent on 0.6 of an acre of parsley. The plants, 13,500, were raised in the greenhouse and set out the third week in April. The variety grown was Perfection. Parsley was marketed throughout the season.

On April 13, 1949, 10,000 Calabrese broccoli plants were set, and about 200 hours of labor were used on this acre. The harvesting began June 8th and continued for a month.

TABLE 30: VEGETABLES, DISTRIBUTION OF HOURS OF LABOR PER ACRE
BY TEN-DAYS PERIODS, 1945, 1947
Market Garden Farm

10-days periods	Rad- ishes	M.&T. greens	Beets	Chard	Pars- ley*	Spin- ach	Broc- coli
March							
First							
Second		2	5	3		1	1
Third		2	13	---		1	---
April							
First	9	3	143	10	3	2	5
Second	1	5	132	290	---	1	1
Third	2	1	114	---	62	1	5
May							
First	3**	8**	25	27	7	5**	2
Second	53	28	85	70	---	16	1
Third	202	61	21	7	8	18	1
June							
First	68	73	14**	57**	3	18	4**
Second	156	20	339	303	78**	6	14
Third	18		267	170	155	---	18
July							
First			114	16	58	---	10
Second			25	50	78	1	14
Third					54	2	7
August							
First						1	---
Second						6	---
Third						2	2
September							
First					30	3	1
Second					10	3	1
Third					97	8***	3
October							
First					7	13	6
Second					33	19	9
Third					30	8	13
November							
First					57	6	5
Second					---	9	4
Third					33	5	
December							
First							
Second							
Third							
Hours per acre							
Growing	12	16	568	407	83	32	29
Harvesting	500	187	759	596	720	123	98
Total hours	512	203	1,327	1,003	803	155	127
Yield per acre	dozen bunches 220	bushels 719	dozen bunches 2,026	dozen bunches 1,000	dozen bunches 2,287	bushels 468	8-qt. basket 280
* 1949	** Harvesting		*** Harvesting, second crop				

TABLE 30: VEGETABLES, DISTRIBUTION OF HOURS OF LABOR PER ACRE
BY TEN-DAYS PERIODS, 1945, 1947 (con't)
Market Garden Farm

10-days periods	Iceberg lettuce	Other lettuce	Peas	Snap beans	Cauliflower		Cab- bage
					early	late	
March							
First							
Second	---	2	1		1		1
Third	8	33			1		---
April							
First	6	21	1	1	---		3
Second	14	18	1	1	1	1	4
Third	8	17	1	2	13	1	2
May							
First	21	16	1	3	6	---	5
Second	4	18		1	5	---	6
Third	34	13**	1	2	10	---	4
June							
First	18	44	26**	4	1	---	3
Second	23**	35	18	5	9**	2	5
Third	33	44	50	1	25	10	5**
July							
First	35	23	25	40**	41	1	10
Second	35		26	191	53	7	9
Third	7		13	93	7	3	10
August							
First	---			11		4	3
Second	1			---		7	4
Third	9			---		22**	4***
September							
First	---			15		10	3
Second	---			25		12	3
Third	9***					16	2
October							
First	8					16	1
Second	6					12	---
Third						16	2
November							
First						18	1
Second						7	3
Third							
December							
First							
Second							
Third							
Hours per acre							
Growing	138	135	6	20	42	52	34
Harvesting	141	149	158	375	131	113	59
Total hours	279	284	164	395	173	165	93
Yield per acre	dozen heads 1,263	dozen heads 1,260	bushels 84	bushels 225	bushels 300	bushels 194	bushels 385

** Harvesting

*** Harvesting, second crop

TABLE 30: VEGETABLES, DISTRIBUTION OF HOURS OF LABOR PER ACRE
BY TEN-DAYS PERIODS, 1945, 1947 (con't)
Market Garden Farm

10-days periods	Squash	Cucum- bers	Musk- melons	Sweet corn	Tom- atoes	Pep- pers	Egg- plant*
March							
First							
Second			1				
Third			---				
April							
First			---		1		
Second		2	1	1	---	1	
Third		---	3	1	1	---	
May							
First	3	8	1	1	---	---	
Second	8	13	8	1	1	---	
Third	2	1	17	2	9	10	35
June							
First	10	9	8	2	2	24	---
Second	3	4	13	2	4	3	3
Third	3	11	13	2	1	4	12
July							
First	7	4	4	1	1	9	---
Second	4**	9**	2	---	1	1	---
Third	4	11	4**	2**	2**	9**	---
August							
First	3	45	3	11	17	7	6**
Second	3	28	3	9	27	10	10
Third	7	5	13	6	19	13	1
September							
First	4		23	3	12	17	27
Second	4		12	2	5	21	31
Third	9		2		7	25	36
October							
First	4				5	11	5
Second	2				2	4	
Third	1					1	
November							
First	1						
Second							
Third							
December							
First							
Second							
Third							
Hours per acre							
Growing	36	58	74	13	21	60	50
Harvesting	46	92	57	33	96	110	116
Total hours	82	150	131	46	117	170	166
Yield per acre	bushels 160	bushels 271	bushels 228	dozen ears 446	bushels 228	bushels 265	bushels 193

* 1949

** Harvesting

TABLE 30: VEGETABLES, DISTRIBUTION OF HOURS OF LABOR PER ACRE
BY TEN-DAYS PERIODS, 1945, 1947 (cont'd)
Market Garden Farm

10-days periods	Endive	Celery	Celery cabbage*	Strawberries	
				Picking bed	New bed
March					
First					
Second					
Third					4
April					
First					---
Second		1			19
Third		---		7	3
May					
First		---		13	---
Second		---		---	10
Third		9		5**	1
June					
First		8		35	1
Second		10		149	---
Third		7		10	21
July					
First	1	5			5
Second	69	18	4		32
Third	21	11	5		---
August					
First	10	11	4		---
Second	32**	5	26		---
Third	55	17	18		---
September					
First	78	4	---		8
Second	58	4	---		13
Third	55	20**	---		3
October					
First	73	38	---		---
Second	66	41	---		---
Third	59	51	2**		---
November					
First	35	35	10		---
Second	49	48	34		---
Third		29	6		---
December					
First		26			---
Second		14			10
Third		20			
Hours per acre					
Growing	198	110	57	20	130
Harvesting	463	322	52	199	
Total hours	661	432	109	219	130
Yield per acre	18 heads 580	dozen bunches 563	dozen heads 267	quarts 2,427	

* 1949

** Harvesting

In April, 1947, 65,000 Iceberg lettuce plants were set and six pounds of seed sown on 5.1 acres. The harvesting began June 17 and continued to July 25. Between 7 and 8 minutes were required to harvest and pack a dozen heads of lettuce. A total of 121 hours per acre were used in growing and 150 hours in harvesting the crop. In the latter part of 1945, a second crop was sown, and the harvesting began in late September and continued through October. The varieties of lettuce grown in 1949 were: 456, Premier Grand Lakes, and Penn Lake.

About an acre of other lettuce including White Boston, Dark Green Romaine, and Grand Rapids was grown in 1949.

To pick the peas and string beans, a large amount of labor is needed for a short period of time, and special crews have been obtained for these jobs. In 1949 the string beans yielded only 128 bushels per acre and about an hour was spent picking a bushel. Another 20 minutes per bushel was used to transport the pickers, to weigh the beans picked per picker, and to distribute the baskets. Only 24 hours per acre were used in growing the crop to picking time. The varieties of string beans were: Black Valentine, Valentine Wax, Longgreen Rivals, and Cherokee Wax.

In 1945 it was estimated that 2,660 hours were spent picking 1,537 bushels of peas. This was at the rate of one hour and $\frac{44}{60}$ minutes per bushel. In addition, 158 hours were used in transporting pickers and busheling. Less than six hours per acre were spent in plowing, fitting, weeding, and sowing the peas.

In 1949 this gardener began setting cabbage on March 29 and cauliflower on April 21. The fall cauliflower was set in late June and the last cabbage plants on July 18th. The first cabbage was cut on June 3, 1949, and marketings continued throughout the season. The varieties were: Yellow Resistant Copenhagen, Penn State, Seneca Danish, Red Acre, and Golden Acre.

The first cauliflower was cut June 8, 1949, and the marketing of the early cauliflower continued through July 6th. Due to hot weather, less than 20 per cent of the plants were cut. The centers turned brown before the heads were formed. The harvesting of the fall cauliflower began September 22nd and continued through November 26th. The varieties grown were: Snowdrift, Reliance, Holland Erfurt, and Snow White. Including tying, a little less than 200 hours per acre were usually spent on cauliflower. The labor on cabbage was 100 hours.

In 1949 this gardener began planting squash and cucumbers on May 4th, and melons on May 9th, and continued off and on until June 1st. The plants were started in the greenhouse and transplanted with a cabbage planter, 5-1/2 - 6 feet, in rows of six feet apart. The varieties of squash included Yankee Hybrid, Butternut, Table Queen, Delicious, and Caserta. The summer squash, Yankee Hybrid, was first harvested on June 22nd. From then on squash was marketed throughout the season.

Cucumbers were harvested from July 9th to the last of August. The varieties grown in 1949 were: A & C, Marketer, and Highmoor.

The melons were harvested during August and September. The varieties were: Seneca Bender, Iroquois, and Schoon's Hardshell. In 1949, in addition to 8 acres of muskmelon, one acre was planted to watermelons, the Early Arizona. Over the years, somewhat less than 100 hours per acre have been spent on squash, about 150 hours on melons, and 200 hours per acre on cucumbers.

For the vegetables grown, sweet corn has required the least labor per acre, an average of 68 hours (table 31). Only 40 hours per acre were used in 1949 when 50 acres were grown. Sweet corn was planted off and on from April 20th to May 30th in 1949. The varieties were: Carmelcross, North Star, Golden Cross, Golden Security, Seneca Chief, Victory Golden, and Spancross. The first corn was picked on July 8th and the last on August 21st.

In 1949, 92,200 pepper plants, 62,500 tomato plants, and 11,500 eggplants were set. The tomatoes were transplanted from April 30th to May 27th, the peppers from May 16th to June 4th, and the eggplant on May 31st. The first 4,000 tomatoes set were protected by hot tents. They were first picked on July 12th, peppers, July 24th, and eggplant, August 4th. The pickings continued until October. The tomato varieties grown included Wisconsin 55, Valiant, Longred, Gem; the pepper varieties were: King of the North, Penn Wonder, California Wonder, Heiferhorn, and Sunnybrook. The eggplant variety was Black Beauty.

Endive, celery, and celery cabbage, as grown on this farm, round out the season by supplying work late in the fall.

Among the major crops grown on this farm, celery has required the most work, over 400 hours per acre (table 31). Over six acres of celery were grown in 1945 and again in 1947, and between three and four acres in 1949. The varieties were: Triumph, Summer Pascal, California Strain # 9, and Cornell 19. In May and June, 1949, the plants were grown in the seed bed and 40,600 were transplanted on the first and second of July. The cutting began the last of September and continued through November. The bleaching was done with paper, and the labor spent bleaching was included with harvesting. The Pascal was not papered. The Triumph was all papered but some sold in the rough. When the hearts are sold, two are wrapped in one parchment paper. Celery could not be successfully grown on this farm without irrigation.

The time spent on irrigation has not been included in the hours of labor required for each vegetable because a separate account was kept with irrigation. The labor charged directly to the vegetables represents 78 per cent of the total labor used in growing, harvesting, and marketing these crops (table 28).

TABLE 31: LABOR REQUIREMENTS FOR CROPS, 1911-48
Market Garden Farm

Crop	Hours of labor per acre	Unit	Units per acre*	Units per 9 hours of labor
Vegetables				
Beets	757	dozen bunches	1,439	17.1
Parsley	---	dozen bunches	---	18.3
Endive	737	1-1/2 dozen heads	802	9.8
Chard	565	dozen bunches	802	12.8
Carrots	514	dozen bunches	1,249	21.9
Radishes	500	dozen bunches	1,489	26.8
Celery	492	dozen stalks	675	12.3
Beans, snap	399	bushels	182	4.1
Lettuce	338	dozen heads	1,849	49.2
Peas**	222	bushels	146	5.9
Tomatoes	214	bushels	358	15.0
Cucumbers	200	bushels	259	11.6
Eggplant	193	bushels	477	22.2
Cauliflower	191	bushels	341	16.1
Peppers	166	bushels	253	13.8
Celery cabbage	160	dozen heads	291	16.5
Mustard, turnip greens	158	bushels	547	31.1
Broccoli	155	8-quart baskets	421	24.5
Spinach	147	bushels	433	26.6
Muskmelon	144	bushels	235	14.7
Cabbage	109	bushels	397	32.7
Potatoes	108	bushels	176	14.6
Squash	96	bushels	190	17.8
Rutabagas	77	bushels	179	20.9
Sweet corn	68	dozen ears	579	76.8
Fruit				
Strawberries	428	quarts	3,456	72.7
Raspberries	311	pints	1,822	52.7
Apples	56	bushels	57***	9.2
Hay and Grain				
Corn for grain	57	bushels (shelled)	38	6.0
Silage corn and sweet corn stalks	---	tons	---	3.4
Oats	19	bushels	42	19.9
Wheat	16	bushels	26	15.1
Hay	11	tons	2.0	1.6

* Weighted average: sum of units divided by total acreage.

** Includes 155 hours, special labor picking.

*** Ciders not included.

In 1945 and 1947 one and one-half acres of endive were grown. The seed was sown in the latter half of July, and tying and cutting started the last of September, continuing through November. The varieties were: Full-heart, Green Curled Pink, and Green Curled White. Because of the increased demand for pre-packaging, more of the Green Curled White Rib is being grown. This is not bleached.

Accomplishment of Labor

The output per hour of labor was obtained by dividing the yield per acre by the hours per acre spent on the crop. All of the accounts kept on this farm since 1914 were used in obtaining the outputs per 9-hour day, as given in table 31. For example, these accounts show that, for the 35-year period, 9 hours of labor have been used to produce six bushels of peas or 15 bushels of tomatoes, or 33 bushels of cabbage.

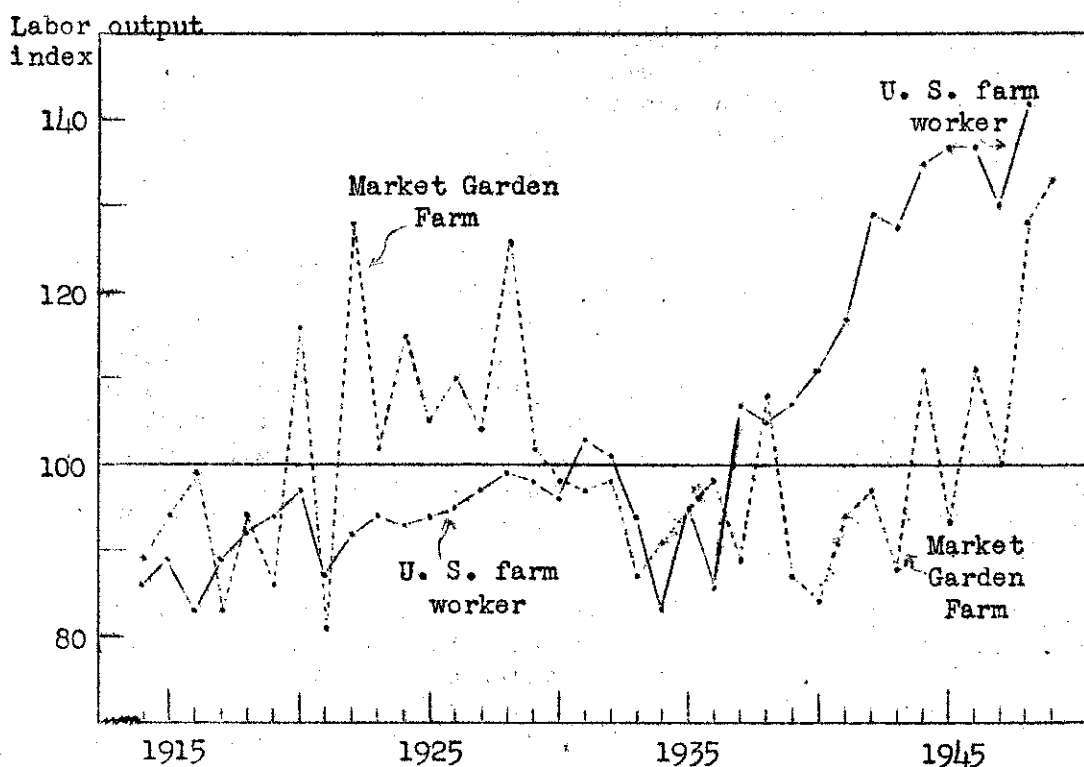
On the basis of these output units, it would require 2,607 9-hour days to grow and harvest the vegetables produced on this farm in 1949. The labor records show that 1,957 9-hour days were actually used. The ratio between these numbers indicates that the labor on this farm in 1949 accomplished in 100 days what would have required, at average output rates, 133 days. The output per 9-hour day in 1949 was 33 per cent above the 35-year average.

Usually, in years of favorable weather, the labor output has been high, and in years of poor yields, low. The indexes of labor output and crop yield have moved up and down together 76 per cent of the time. It is surprising that, with the increased mechanization and with a larger business, the labor output from 1941-48 averaged about what it was 20 to 25 years ago (table 32). Apparently, the hand labor jobs which constitute much of the work on vegetables had not been materially reduced. A factor that has tended to keep labor output low was the low crop yields during 1941-48. The vegetable crop index was 15 per cent lower than in 1914-28.

Perhaps 1948 and 1949 forecast a higher level of labor output for this farm. The index of labor output reached 128 in 1948 and an all-time high in 1949 of 133. The gross production per farm worker in the United States, as reported by the United States Department of Agriculture, reached an all-time high in 1948 of 142, when 1935-40 is expressed as 100 (figure 10).

TABLE 32: ACCOMPLISHMENT OF LABOR BY PERIODS, 1914-48
Market Garden Farm

Period	Market Garden Farm		Index of labor output	United States gross production per farm worker <u>1/</u>
	Number of 9-hour days on vegetables			
	Actually spent	Required at average output rates		
1914-28	976	997	102	92
1929-40	998	932	94	99
1941-48	2,245	2,298	103	132

Figure 10: INDEX OF LABOR OUTPUT, 1914-48 = 100 - Market Garden Farm
GROSS PRODUCTION PER UNITED STATES FARM WORKER, 1935-39 = 100 ^{1/}

On the Market Garden Farm, 1922-29 was a period of high output per day per worker. From 1930-47, even with more mechanical power and equipment, this rate of output was duplicated in only three years out of 18. However, output was unusually high in 1948 and 1949 and is nearer the output for all farm workers in the United States.

^{1/} "Farm Production Practices, Costs, and Returns", United States Department of Agriculture, Bureau of Agricultural Economics, Statistical Bulletin No. 83, October, 1949.

TABLE 33: ACCOUNT WITH GREENHOUSES, 1949
Market Garden Farm

Debit		Credit	
Inventory beginning year		Inventory end of year	\$ 4,400.00
Greenhouses and cold frames	\$ 4,200.00	Sold	
Seeds purchased		Tomato plants, 8,500	85.00
Beets, 29 lbs.	36.82	Pepper plants, 200	2.00
Broccoli, 3/4 lb.	4.20	Melon hills, 50	2.50
Cabbage, 2-1/2 lbs.	18.40	Greenhouse crops	
Cauliflower, 2-1/4 lbs.	97.20	Tomatoes, 980 lbs.	274.00
Chard, 1 lb.	1.35	Lettuce, 399 flats	262.30
Celery, 1-7/8 lbs.	44.87	Plants charged to crops	
Cucumbers, 9 lbs.	22.15	Beets, 47,700 @ \$7 per M	333.90
Eggplant, 3/4 lb.	6.50	Broccoli, 10,000 "	70.00
Lettuce, Iceberg, 5-1/2#	31.95	Cabbage, 121,100 "	847.70
Lettuce, other, 4-3/4 lbs.	20.20	E. Caulif., 65,000 "	455.00
Muskmelon, 11-1/4 lbs.	47.30	Chard, 10,000 "	70.00
Parsley, 1/2 lb.	1.00	Celery, 40,600 "	284.20
Peppers, 4 lbs.	32.35	Eggplant, 11,500 "	80.50
Squash, 12-1/4 lbs.	45.90	Lettuce	
Tomatoes, 2 lbs.	19.80	Iceberg, 79,500 "	556.50
Watermelon, 3 oz.	6.75	Other, 49,700 "	347.90
Progress, 2 oz.	2.70	Parsley, 13,500 "	94.50
Sand, 3,700 lbs.	5.55	Peppers, 92,200 "	645.40
Fertilizer, 300 lbs. 5-10-10	7.18	Tomatoes, 62,500 @ \$9	562.50
Steaming soil	120.00	Cucumbers, 2,590 @ \$50	129.50
Coal for steaming, 1,070 lbs.	6.02	Melons, 15,880 "	794.00
Coal, 9 tons	187.95	Squash, 11,520 "	576.00
Puttylastic, 20 gals.	85.00		
Glass, 5 boxes 16" x 24"	35.50		
2 boxes	7.11		
Paint, 5 gals.	26.87		
Plant boxes, 890	80.10		
Fungicides, dust	28.71		
Supplies, equip., freight	33.70		
Packages	24.06		
Electricity	31.23		
Interest	215.00		
Taxes	68.30		
Man hours, 2,482	2,681.47		
Tractor hours, 41	30.78		
Truck miles, 51	10.17		
Use of buildings	6.28		
Water system	32.71		
Use of equipment	399.04		
Marketing expense	28.65		
Gain	2,082.58		
	<u>\$10,873.40</u>		<u>\$10,873.40</u>

ACCOUNTS SUMMARIZED

Greenhouses, Cold Frames

As previously pointed out, more time has been spent growing plants in the greenhouses and cold frames than on any crop except peas (table 11). Most of the work in the greenhouse has been done by the regular hired help. Although women could do the work more cheaply, there is nothing better for most of the men to do at this time of year.

In 1949 about 540,000 plants were credited to the greenhouse and charged to the proper crop accounts at \$7.00 per thousand (table 33). The 62,500 tomato plants were valued at \$9, and 30,000 melons, squash, and cucumbers at \$50 per thousand. At these prices, the greenhouse account showed a profit of \$2,083. This was the largest profit the greenhouse ever made. In only one other year did the profit exceed \$1,000. For the 36-year period the average annual profit has amounted to \$278.

In 1949 it cost this grower one-third less than the above prices to produce the plants. The greenhouse account would have balanced if the tomatoes had been credited at \$5.76 per thousand, the melons, squash, and cucumbers at \$32, and the other plants at \$4.50 per thousand.

The largest item of expense in growing the plants was \$2,681 for labor. Over \$400 was spent for seeds used in the greenhouse. These two items, however, represented less than half of the total cost of operating the greenhouse.

Sweet Corn

In 1949 this farmer planted the most sweet corn he has ever grown, 20 acres at home, and 30 acres on rented land. The sweet corn account showed a profit of \$790. With a much smaller acreage but with two-fifths more corn per acre, a larger profit than this has occurred in eleven of the past 36 years. A loss occurred in nine years, including the year 1935.

The yields per acre in 1935 and 1949 were about the same, averaging 450 and 474 dozen ears respectively. The costs and returns per acre for these two years are summarized in table 34.

In the 15 years the cost per acre has more than doubled, an increase from \$60 in 1935 to \$135 in 1949. In this 15-year period much has happened to the value of the dollar and to the methods used in producing sweet corn.

One of the most striking changes has been the wage rate, an increase on this farm from 30 cents in 1935 to \$1.08 in 1949. With such an increase, it was more important than ever to economize on labor.

TABLE 34: COSTS AND RETURNS FROM SWEET CORN, 1935, 1949

Market Garden Farm

Items	1935			1949		
	14.7 acres 6,619 dozen ears			50.3 acres 22,570 dozen ears, 7 tons to freezer		
	Amount	Price	Value	Amount	Price	Value
<u>Cost per acre</u>						
Use of land, acre	1	\$11.39	\$11.39	1	\$15.69	\$15.69
Plant food						
Manure, tons	0.56	2.60	1.45	0.87	4.16	3.62
Cover crop			0.66			2.61
5-10-5, lbs.	578	0.012	7.00	28	0.029	0.81
Ammonium nitrate, lbs				179	0.045	8.02
6-12-6, lbs.				596	0.022	13.28
Uramon, lbs.				20	0.048	0.97
Seed, lbs.	10.4	0.18	1.89	7.8	0.39	3.05
Crow repellent, qt.				0.02	1.75	0.03
Dust, lbs.				54	0.11	5.78
Spray, No. 2, 4-D, gals.				0.08	6.50	0.52
Labor						
Growing, hours	27.6	0.30	8.22	9.5	1.08	10.26
Picking, hours	30.6	0.30	9.11	30.7	1.08	33.12
Power, equipment						
Horse work, hours	24.4	0.29	7.10	6.3	0.85	5.34
Tractor, hours	2.6	0.61	1.58	6.5	0.77	5.01
Other equipment			3.63			7.78
Irrigation						2.46
Interest on growing costs			0.38			0.73
Containers			3.06			7.35
Marketing			4.98			8.35
Total cost per acre			\$60.45			\$134.78
<u>Returns per acre</u>						
Market corn, doz. ears	450	0.115	51.86	449	0.33	146.31
Freezer corn, tons				0.14	30.00	4.18
Seed corn, lbs.	5.7	0.11	0.65			
Feed corn, bu.	3.4	0.10	0.34			
Corn for fodder, tons	4.5	0.50	2.25	3.0	0.00	0.00
Total returns per acre			\$55.10			\$150.49
Gain or loss per acre		Loss	\$ 5.35		Gain	\$ 15.71
<u>Per dozen ears</u>						
Price			0.115			0.326
Net cost			0.127			0.291
Difference		Loss	0.012		Gain	0.035
<u>Labor</u>						
Hours per acre, growing and picking	58			40		
Returns per hour			\$0.21			\$1.47
Cost per hour			0.30			1.08
Difference		Loss	\$0.09		Gain	\$0.39

In 1935 four hours per acre were spent cultivating with horses, two hours with the small Bolen tractor, and 1 $\frac{1}{4}$ hours hand-hoeing. In 1949 this farmer sprayed for weed control and spent only two hours per acre cultivating with the Allis Chalmers, and 1 $\frac{1}{4}$ hours hand-hoeing. It took 18 fewer hours per acre to grow the corn to picking time in 1949 than in 1935. In 1949, 18 fewer horse hours were used per acre but four more tractor hours.

Dusting corn for worm control and irrigating 10 acres were practices followed in 1949 that were not used in 1935. In 1935 corn fodder was credited at 50 cents per ton. The corn stalks were put in the silo in 1949, but no value has been placed on them since 1945. With high-priced labor and small stalks, they are hardly worth the cost of gathering.

If the methods used on this farm in 1935 had been followed in 1949, then the cost per acre would have been \$16 more, and there would have been no profit.

Cauliflower

Under the direction of Dr. E. G. Misner, this department made a study of the production and marketing of cauliflower for the year 1936 on 100 farms in Delaware County.

On an average, the Delaware farmers grew four acres of cauliflower. In the same year, the Market Gardener had 1.3 acres of early and 1.2 acres of late cauliflower. The late cauliflower was a failure but the early produced 481 crates per acre which was 11 per cent above the Delaware average (table 35).

The Delaware growers followed more intensive practices. They applied 3,600 pounds of fertilizer per acre on their cauliflower which was more than twice the amount used on the Market Garden Farm. Not including work on the seed bed, the Delaware growers spent 397 hours on an acre of cauliflower or 120 more than the Market Gardener.

The Delaware growers received 47 cents more per crate, but their costs were 66 cents higher; consequently, the Market Gardener, on his early cauliflower, made the larger profit per crate. On the four acres the Delaware farmers cleared \$345 while the Market Gardener made \$243 on his early but lost \$189 on his late.

Prior to 1936, cauliflower on the Market Garden Farm had shown a profit in 10 years and a loss in eight. Since 1936, it has shown a profit in every year but one, an average profit of \$975.

For the last seven years (1942-48), compared to the preceding six (1936-41), costs on an acre basis increased 59 per cent. However, cauliflower prices more than doubled. This encouraged more intensive practices. The fertilizer applied per acre was increased from 986 pounds to 1,845, and dust, from 61 pounds to 159 (table 36).

TABLE 35: ANALYSIS FACTORS, CAULIFLOWER, 1936
Market Garden Farm and Delaware County Farms Compared

Factors	Average of 100 Delaware County farms 1/	Market Garden Farm	
		Early	Late
Acres in cauliflower	4.1	1.3	1.2
Yield per acre, crates	424	481	25
Labor			
Hours per acre			
Growing plants	43	---	---
Cultivating, tying, etc.	241	158	154
Harvesting, marketing	156	119	22
Total	440	277	176
Return per hour	\$0.45	\$0.96	-\$0.62
Cost per hour	0.26	0.28	0.28
Gain per hour	\$0.19	\$0.68	-\$0.90
Fertilizer			
Pounds used per acre	3,600	1,308	1,583
Price per ton	\$30.81	\$27.40	\$26.53
Average, per bushel crate			
Price	\$1.45	\$0.98	\$0.74
Cost	1.25	0.59	7.05
Gain	\$0.20	\$0.39	-\$6.31
Gain from crop	\$345	\$243	-\$189

But, wages also doubled and, therefore, less labor was used. For example, cauliflower is now graded and packed in the field as it is cut. If there is a market for seconds, an extra box is carried along. Cauliflower formerly was sold in bushel baskets. Now closed crates holding a dozen heads are used.

If the cauliflower had been grown by the methods followed in the earlier period, then the cost in the last seven years would have averaged \$48 more per acre.

1/ "Production and Marketing of Cauliflower in Delaware County, 1936", J. N. Efferson, Cornell University Agricultural Experiment Station, Ithaca, New York, Bulletin 701, July, 1938.

TABLE 36: COSTS AND RETURNS FROM CAULIFLOWER, 1936-41, 1942-48
Market Garden Farm

Items	1936-41			1942-48		
	35.7 acres 14,068 bushels			57.9 acres 19,915 bushels		
	Amount	Price	Value	Amount	Price	Value
<u>Costs per acre</u>						
Use of land, acre	1	\$10.21	\$10.21	1	\$15.41	\$15.41
Plant food						
Manure, tons	4.3	2.52	10.84	4.8	3.83	18.23
Cover crops			2.42			3.04
Sodium nitrate, lbs.	291	0.018	5.12	332	0.022	7.33
Other fertilizer, lbs.	695	0.019	13.23	1,513	0.018	27.92
Lime, lbs.	28	0.004	0.12	813	0.003	2.82
Borax, lbs.				3		0.09
Plants, M	4.8	5.29	25.56	5.0	5.91	29.90
Seed, ounces	2.3	2.60	6.09	2.1	4.31	9.09
Dust, calogreen, lbs.	0.5	2.50	1.18	0.4	3.20	1.38
Dust, other, lbs.	61.0	0.058	3.50	159	0.089	14.19
Irrigation						
Labor, hours	19	0.31	5.78	10	0.78	7.56
Electricity			3.14			3.27
Use of equipment			10.00			14.76
Twine			5.14			4.95
Marketing						
Containers			20.20			37.52
Labor, hours	29	0.31	8.99	16	0.74	12.03
Truck, miles	110	0.08	8.54	93	0.11	10.04
Other			12.81			5.78
Other labor						
Growing, hours	76	0.31	23.30	50	0.76	38.31
Tying, cutting, hours	164	0.30	50.08	116	0.77	89.69
Power, equipment						
Horse work, hours	34	0.22	7.30	26	0.54	13.80
Tractor, hours	7	0.53	3.49	8	0.76	6.32
Other equipment			3.71			7.90
Interest on costs			1.96			1.82
General expense			0.12			3.17
Total cost per acre			\$242.83			\$386.32
<u>Returns per acre</u>						
Cauliflower, bushels	394	0.79	309.87	344	1.64	564.13
Plants sold			0.76			1.04
Total returns per acre			310.63			565.17
Gain per acre			67.80			178.85
<u>Gain per bushel</u>						
Return			\$0.79			\$1.64
Cost			0.61			1.12
Gain per bushel			\$0.18			\$0.52
<u>Labor</u>						
Hours per acre	287			192		
Return per hour			\$0.54			\$1.70
Cost per hour			0.31			0.77
Gain per hour			\$0.23			\$0.93

Cattle

Here is an enterprise which has been continued even though the cattle account has shown a loss in every year but one since 1914. The loss has amounted to an average of \$670 per year when the manure in the barn was valued around \$2.00 per ton. If the manure had been credited to the cattle at \$6.36 per ton, the account would have balanced (table 37).

During the 34 years, an average of 1,181 hours of labor charged at \$543 was used caring for the cattle. The cattle were also charged an average of \$163 for the use of the barn. If no charge were made for labor and buildings, the cattle account would balance with manure at \$2.00 per ton.

The Market Gardener has continued wintering cattle over the years at a loss for the following reasons: (1) in order to keep a good man, he has hired one by the year with the result that he has surplus labor in the winter, (2) the barn was built years ago when the home farm was operated with a dairy. According to his judgment, the best use that could be made of surplus winter labor and the cow barn was to donate them for manure at \$2.00 per ton.

Some have suggested that these considerations be shown in the account by charging labor and buildings at opportunity cost. But this mixes interpretation with the accounting and is confusing. The purpose of keeping cost accounts is to find how much better some enterprises pay than others. Interpretation follows after the accounts have been closed.

In recent years, cattle have been boarded as well as purchased. During the winter of 1942-3, this farmer boarded 13 steers for \$265 and was paid 12.5 cents for each pound of gain. He has also boarded cattle for dairy farmers. During the winter of 1944-5 twenty heifers and a bull were boarded for \$500. In 1948-9, \$914.75 was received for boarding the equivalent of 3,867 cattle days, a return of 24 cents per day per head.

For the past five years (1945-49) the accounts show that \$2,034 has been lost on hay, \$697 on oats, and \$5,595 on cattle. This amounts to a loss on the three enterprises of \$1,665 per year.

If there is no way to reduce these losses, and if these enterprises cannot be replaced with something that will lose less, then the losses can be reduced by letting the land that is unsuitable for sweet corn and other vegetables lie idle and by purchasing the manure from nearby dairy farms.

TABLE 37: COSTS AND RETURNS FROM CATTLE, 1914-47, 1949
Market Garden Farm

Items	Average per year for 34 years 1914-47		1949	
<u>Returns</u>				
Cattle	32 head @ \$71	\$2,269	25 head @ \$173	\$4,316
Calves	4 head	72		
Butter, milk		300		
Boarding cattle, hides, etc.		116	18 head	918
Increase in inventory		52		990
Total returns other than manure		\$2,809		\$6,224
<u>Costs</u>				
Cattle purchased	32 head @ \$54	\$1,738	44 head @ \$91	\$4,014
Feed and bedding				
Grain	11.9 tons @ \$39	462	12.2 tons @ \$50	610
Hay	8.8 tons @ \$13	118	33.6 tons @ \$20	673
Pea vines	7.0 tons	51		
Corn silage	82.4 tons @ \$4.18	364	141 tons @ \$7.48	1,055
Corn stalks, etc.		24		
Sawdust shavings		23		
Straw	9.6 tons	95	9.5 tons	169
Other direct costs				
Veterinary medicine		12		10
Marketing insurance, etc.		22		10
Interest on costs		92		195
Total direct costs		\$3,001		\$6,736
Returns less direct costs		-\$192		-\$512
<u>Other costs</u>				
Labor	1,181 hours @ 46¢	\$543	618 hours @ \$1.08	\$668
Use of buildings		163		274
Pasture and fences		21		68*
Use of equipment		45		46
Water, telephone, electricity		22		63
Total other costs		\$794		\$1,119
<u>Manure</u>				
Net cost	155 tons @ \$6.36	\$986	252 tons @ \$6.47	\$1,631
Value	155 tons @ \$2.04	316	252 tons @ \$2.00	504
Difference, loss		\$670		\$1,127

* 4 acres rented

FARM ANALYSIS

Market Garden Farm 2

In 1936 a farm management class had the opportunity of visiting another Erie County gardener. He spent an evening with us, recounting his experiences as a gardener and answering specific questions about his 1935 business, the acreage, yield, and income from each crop, and each item of expense. From this information the students made a summary of the year's business as shown in table 38.

After all of his farm expenses were paid and a charge was made for interest on his farm capital, there was left for his labor, \$4,290. His labor income exceeded that on the cost account farm by about \$1,000.

We found that a considerable part of his farm, besides the seven acres of muck, was a sandy loam, free from stones - soils especially favorable for root crops. Differences in soils between this farm and the cost account farm was our explanation for the differences in acreage of root crops. This farmer had more than 30 acres of radishes, carrots, and beets, while the cost account farmer grew less than two.

We were surprised that so many radishes could be marketed. He distributed his supply over the season, and in addition to the Buffalo market, supplied other nearby cities by selling to chain stores and to truckers at the farm. He mentioned that a light top dressing of manure heightened the color of his radishes. A gardener usually finds it profitable to make a speciality of products that he can grow unusually well.

From the labor records kept on cost account farms, work unit and output unit rates have been calculated. The students multiplied the acreage of each vegetable grown on this farm by the work units per acre, as given in table 48. The sum of the products showed that this farmer had 3,153 work units. In other words, the acreages of vegetables on this farm would, under average conditions, call for 3,153 days of work.

The output units, on the other hand, are calculated from production. The total production of each vegetable was divided by the units of output per 9 hours of labor. The sum of the quotients showed that 3,070 days or output units would be required, under average conditions, to raise the vegetables on this farm. For example, to grow 10 acres of sweet corn would require, on the average, 70 days.

10 acres x 7 work units per acre = 70 work units
But, to grow 7,255 dozen ears of sweet corn would require, on the average, 102 days.

7,255 dozen ears ÷ 71 dozen ears per 9 hours = 102 output units
The work units and output units can be used to calculate the yield index. This farmer's yield of sweet corn was 46 per cent above the standard yield of 500 dozen ears per acre.

$$102 \div 70 \times 100 = 146 - \text{yield index}$$

TABLE 38: FARM NUMBER 2: BUSINESS ANALYSIS RECORD
Erie County Market Garden Farm

Year ending December 31, 1935. Total acres owned, 86; cash rented, 10. Soil type, Palmyra gravelly loam, Wooster gravelly loam, Toledo silty clay loam. Elevation, 820'. 1/2 mile to town, 8 to city.

Kind	Acres	Yield		Sales		
		Per acre	Total	Amount	Price	Value
Asparagus	2	303 doz. bunches	606	606	\$1.05	\$ 634
Asparagus, new bed	2					
Beans, green	3	275 bushels	826	826	0.88	725
Beans, yellow	1.5	167 bushels	250	250	1.04	260
Beets	7	761 doz. bunches	5,329	5,329	0.24	1,266
Beet greens	2	386 bushels	771	771	0.49	380
Carrots	12	136 bushels	1,633	1,633	0.61	996
		802 doz. bunches	9,629	9,629	0.17	1,616
Cauliflower	4	616 bushels	2,463	2,463	0.58	1,424
Celery	4	990 doz. bunches	3,959	3,959	0.51	2,006
Lettuce	5	517 2 doz. heads	2,583	2,583	0.49	1,255
Onions, dry	4	427 bushels	1,709	1,709	0.94	1,610
Onions, green	.75	doz. bnch.	10,021	10,021	0.05	524
Parsley	.25	doz. bunches	1,282	1,282	0.26	334
Parsnips	4	500 1/2 bushels	2,007	2,007	0.54	1,080
Peas	1.5	395 bushels	593	593	0.89	529
Radishes	10	1,326 doz. bnch.	13,258	13,258	0.18	2,440
Rhubarb	.12	doz. bunches	150	150	0.25	37
Spinach	15	326 bushels	4,896	4,896	0.42	2,033
Squash, Hubbard	2	167 bushels	334	334	0.77	257
Sweet corn	10	145 5 doz. ears	1,451	1,451	0.56	818
Tomatoes	.75	bushels	340	340	0.63	216
Totals	90.87					\$20,440

TABLE 38; FARM NUMBER 2: BUSINESS ANALYSIS RECORD (con'd)
Erie County Market Garden Farm

Farm Expenses		Inventory of Farm Capital		
Hired help			Beginning	End
2 year men	\$ 1,760	86 acres	\$25,000	\$25,000
Other help @ 17.5 ¢ per hour	4,524	Cows, 1	100	100
Value, son's labor		Horses, 2	350	350
46 weeks	1,380	Hens, 20	20	20
Building repairs	200	Reo 2 ton truck	875	700
Fire insurance	87	Tractor, Cletrax	700	500
Hay, straw, grain	490	Tractor, garden	250	175
Horse shoeing	25	Other tools	1,150	1,000
Manure, 250 tons	188	Irrigation system	1,000	1,000
Fertilizer, 40 tons, 5-10-5	1,000	Total	\$29,445	\$28,845
Seed, plants	720	Average	\$29,145	
Spray materials	568			
Taxes	496			
Telephone, farm share	22			
Electricity	15			
Packages	1,321			
Stall rent	75			
Water rent, 22¢ per M gallons	379			
Repairs, irrigation system	20			
Rent, 10 acres	145			
Truck expenses				
Insurance	56			
License	43			
Tires	50			
Repairs	75			
Tractor repairs	200			
Repairs, other machinery	220			
Gas and oil	425			
Farm share auto	100			
Decrease in capital	600			
Total	\$15,184			

Financial Summary		
Receipts		
Crops		\$20,440
Calf sold		16
Milk, 2,000 quarts @ 8¢		160
Jury, 10 days		40
Team work, off farm		25
Tractor work, off farm		250
Total		\$20,931
Expenses		
Income from capital		
and operator's labor		\$5,747
Interest on \$29,145 @ 5%		1,457
Labor income		\$4,290
Privileges		
Milk & vegetables	\$200	
Rent for house	600	800
Labor earnings		\$5,090
Value operator's labor		\$1,560
Return on capital		
Total		\$4,187
Per cent		14.4

Work units were calculated on the basis of acreage, and output units on the basis of production. To these work and output units on vegetables were added 4.6 more to include the work required in caring for a cow and 20 hens, and the work that was done off the farm.

The cost account farm, in 1935, was found to have 1,156 work units and 1,089 output units. This included the work on hay, grain, and livestock, as well as on vegetables. For neither farm do the work and output units account for all of the labor. They do not include work caring for horses, repairing machinery, buildings, and the like. For the market garden crops the standards do not include either the labor spent irrigating or the time to grow the plants in the greenhouse. The units should be used as index numbers and not as absolute quantities.

The students found that this farmer had a business, at that time, about three times larger than the cost account farm (table 39). The labor on this farm, reduced to the equivalent in year-men, was 13.1 compared to 4.6 for the cost account farm. The accomplishment per man, the yields per acre, and the prices received were about the same on both farms.

Since our visit, this farmer has added several labor-saving tools. All sowing is now done with a 5-row seeder and then cultivated five rows at a time. He is using weed killers on parsley, parsnips, celery seed bed, and carrots, eliminating a lot of stoop labor. Such practices have been instrumental in preventing the labor bill from increasing as rapidly as wages.

Market Garden Farm 4

The farm management class of 1948 had the opportunity of visiting farmer 4. This young man was especially interested in his agricultural studies in high school, and, upon graduation in 1936, decided to be a market gardener and began clearing a piece of muck on his father's farm.

For the next six years, he spent most of his time clearing and draining the 35 acres of muck. He did this work with his own machinery and laid about four miles of tile. He was adept at engineering and mechanical work and did an outstanding job developing the muck and installing an irrigation system. In 1941 he bought the farm from his father on contract.

I like the way he has arranged his account book for keeping track of his workers and vegetable sales. He uses a Daybook, 12" x 8". He turns over the first leaf and, on the left margin of page 2, writes the names of his workers, one under the other, and, toward the bottom of the page, the names of the vegetables that he is marketing at that time, one under the other. The next six leaves (pages 3 to 14) are trimmed so that, when turned, they do not cover the names listed on page 2. This furnishes a page a day for a week and eliminates writing the names every day. On page 2 he checks the persons who worked that day and enters the quantity and price of vegetables sold. He turns the page to record the

TABLE 39: BUSINESS ANALYSIS FACTORS, 1935
Market Garden Farms

Factors	Farm 2 Analyzed by students	Cost account farm
<u>Size of business</u>		
Acres		
Owned	86	78
Rented	10	0
Cropped	80	62
Work units	3,199	1,156
Output units	3,116	1,089
Operator's capital	\$29,145	\$27,095
<u>Acres in vegetables</u>		
Radishes	10	.10
Carrots	12	.25
Beets	9	1
Parsnips	4	--
Celery	4	--
Onions	5	--
Spinach	15	6.10
Lettuce	5	3.30
Cauliflower	4	3.50
Sweet corn	10	14.70
Melons	--	2.60
Other	13	18.40
Total	91	50.00
<u>Organization</u>		
Number of vegetables grown	17	25
Per cent work units on vegetables	99	80
Man equivalent	13.1	4.6
Inventory value of machinery	\$3,675	\$1,612
Inventory value of machinery, per crop acre	\$46	\$26
<u>Yields and Fertilizer purchases</u>		
Vegetable yield index	97	95
Fertilizer purchased	\$1,000	\$509
Fertilizer per crop acre	\$12.50	\$8.21
<u>Labor costs</u>		
Hired	\$7,664	\$1,967
Value of operator's time	1,560	1,500
Total	\$9,224	\$3,467
Per man equivalent	\$704	\$754
<u>Accomplishments of labor</u>		
Work units per man	244	251
Output units per man	238	237
<u>Prices</u>		
Vegetable price index	82	81
Labor income per operator	\$4,290	\$3,187

next day's entries. This leaves him all the pages on the right hand side to jot down notes. It is worth while to have plenty of space for comments. Among other things, he made a sketch of how he could rebuild and improve one of his machines. The pages contain many ideas which are worth his while to keep in mind. For example, "Short of boxes. Should have gotten more last winter." "Using too much high-priced labor. Should have more women help." From these books were obtained the sales by month for 1947 and 1949, as given in table 40.

In the early spring most of his income came from asparagus. Some muck soil was sold on the market for potted plants. By June he was selling green onions, radishes, and spinach. By July lettuce was included, and, by August, most of his crops including celery, onions, carrots, and cucumbers were moving to market. Potatoes were sold in the fall and the season ended with the sale of Christmas trees.

Farmer 4 differs from the other market gardeners visited in that he sells on both the retail and wholesale markets. The retail market has furnished him an outlet for surpluses and a chance to sell vegetables of low grade that could not have been disposed of on the wholesale market. Selling at both markets required an extra man, and his father looked after the retail trade.

A summary of the year's business for 1949 shows that the sales and the farm expenses each amounted to slightly more than \$21,000. He earned \$1,100 for work off the farm which accounted for his labor income (table 41). A comparison of the factors on this farm (farm 4) with the cost account farm and farm 3 may help in understanding why this farm did not pay so well as the others (table 43).

It is not because of size of business. As measured by work units, this farm was as large as farm 3 and 58 per cent as large as the cost account farm. However, the output units were low relative to the work units. This was caused by relatively low yields. His celery and onion yields were about average, but carrots, radishes, spinach, and lettuce produced half a crop or less. His vegetable yield index of 73 was one-fourth lower than the cost account farm and one-third lower than farm 3.

This farm is situated a few miles from the other market garden farms and conditions may not be as favorable for vegetables as they are in the market garden area. This farmer does not have a greenhouse.

The father spends the winter in Florida and there raises the celery plants which he ships to his son. This business is being expanded this year and orders taken from other market gardeners.

Emphasis on the different vegetables varies among the gardeners. The cost account farmer grew 22 different vegetables and the two most important ones, sweet corn and cauliflower, each accounted for only 13 per cent of the total output units on vegetables. The young gardener was more specialized. He produced only 11 vegetables, and celery and carrots accounted for more than half of his total output units.

TABLE 40: SALES BY MONTHS ON NEWLY DEVELOPED MUCK FARM, 1947, 1949
Farm 4

Kind	1947			1949		
	Amount	Price	Value	Amount	Price	Value
Muck soil, bushel						
May	596	\$.40	\$239.20	263	\$.43	\$112.95
June	96	.40	38.40	40	.44	17.50
	692	.40	277.60	303	.43	130.45
Asparagus, pound						
May	1,118	.21	239.50	1,006	.20	201.20
June	1,959	.20	391.80	1,729	.19	330.60
July	60	.20	12.00	399	.19	75.40
	3,137	.20	643.30	3,134	.19	607.20
Green onions, dozen bunches						
May	67	.40	26.80	76	.38	29.20
June	475	.41	193.00	302	.40	121.95
July	437	.36	157.05	3,196	.46	1,464.92
August	155	.35	54.25			
	1,134	.38	431.10	3,574	.45	1,616.07
Radishes, dozen bunches						
May	110	.50	55.00			
June	481	.40	192.30	756	.33	253.20
July	520	.40	208.00	979	.41	401.15
August	240	.49	118.50	1,046	.36	375.63
September				239	.33	78.65
October				268	.30	81.50
	1,351	.42	571.80	3,288	.36	1,190.13
Spinach, bushel crate						
June	133	1.16	154.50	161	1.05	168.25
July	107	1.44	153.90	22	1.52	33.45
August	118	1.20	141.90	8	1.50	12.00
September				123	1.17	143.65
October				313	.75	235.30
	358	1.26	450.30	627	.95	592.65
Curly lettuce, 8# flat						
June	15	1.27	19.10	6	.50	3.00
July	190	.41	78.70	124	.63	78.45
August	105	.52	54.40	177	.68	121.20
September				324	.67	216.40
	310	.49	152.20	631	.66	419.05
Boston lettuce, 2 dozen heads						
July	154	1.15	176.55	34	1.25	42.50
August	10	1.00	10.00			
	164	1.14	186.55	34	1.25	42.50

TABLE 40: SALES BY MONTHS ON NEWLY DEVELOPED MUCK FARM, 1947, 1949 (con't)
Farm 4

Kind	1947			1949		
	Amount	Price	Value	Amount	Price	Value
Romaine lettuce, 2 dozen heads						
July	163	\$1.05	\$171.00			
August	21	1.30	27.20			
	<u>184</u>	1.08	198.20			
Iceberg lettuce, 2 dozen heads						
July	89	1.50	133.50	59	\$1.51	\$ 89.20
August	39	1.69	65.80			
	<u>128</u>	1.56	199.30	<u>59</u>	1.51	<u>89.20</u>
Beets, dozen bunches						
July	65	.74	47.85			
August	134	.56	75.50			
	<u>199</u>	.62	123.35			
September, bushels	22	1.38	30.30			
Carrots, dozen bunches						
July	38	.60	22.80			
August	1,556	.70	1,089.60	2,155	.31	659.95
September	958	.59	564.30	1,460	.71	1,032.30
October	99	.76	75.20	1,556	.52	805.70
November	4	.75	3.00	598	.51	307.13
	<u>2,655</u>	.66	1,754.90	<u>5,769</u>	.49	2,805.08
Carrots, bushel						
August	56.5	1.46	82.75			
September	218	1.54	335.15	172.5	.89	154.35
October	393	1.54	605.45	177	.69	122.90
November	260	1.65	428.25	47	.60	28.00
December	3	2.00	6.00	76	1.37	104.26
	<u>930.5</u>	1.57	1,457.60	<u>472.5</u>	.87	409.51
Cucumbers, bushel						
July				20	2.66	53.10
August	160	1.63	261.25	121.5	.90	109.20
September	106	1.64	174.00	135	.86	116.00
	<u>266</u>	1.64	435.25	<u>276.5</u>	1.01	278.30
Dill, bushel						
August	24	1.14	27.40	87	.95	82.30
September	59	.96	56.50	305	.86	261.50
	<u>83</u>	1.01	83.90	<u>392</u>	.88	343.80
Celery, dozen bunches						
August	631	1.03	650.00	2,627	.50	1,320.85
September	880	.84	735.30	2,298	.84	1,925.45
October	1,412	.88	1,240.70	3,548	.62	2,185.85
November	173	.91	156.70	861	.43	371.95
December				218	.67	146.88
	<u>3,096</u>	.90	2,782.70	<u>9,552</u>	.62	5,950.98

TABLE 40: SALES BY MONTHS ON NEWLY DEVELOPED MUCK FARM, 1947, 1949 (con'd)
Farm 4

Kind	1947			1949		
	Amount	Price	Value	Amount	Price	Value
Onions, 10# sack						
August	60	\$.50	\$ 30.00	102	\$.55	\$ 56.00
September	849	.53	453.45	417	.65	271.45
October	1,320	.58	772.00	594	.65	386.10
November	718	.66	475.35	130	.65	84.25
	<u>2,947</u>	.59	1,730.80	<u>1,243</u>	.64	797.80
Onions, 50# sack						
August	16	2.12	34.00	4	2.38	9.50
September	323	2.28	737.25	274	2.43	666.35
October	454	2.51	1,138.00	244	2.50	610.00
November	76	2.67	202.55	95	2.40	228.00
December	5	4.00	20.00	11	1.50	16.50
	<u>874</u>	2.44	2,131.80	<u>628</u>	2.44	1,530.35
Potatoes, bushel						
September	140	2.00	280.00	130	1.82	236.65
October	1,116	1.79	1,994.70	210	1.54	323.25
November	1,069	1.93	2,058.50	167	1.49	248.00
December	10	2.00	20.00	1,791	1.43	2,564.83
	<u>2,335</u>	1.86	4,353.20	<u>2,298</u>	1.47	3,372.73
Corn, dozen ears						
September				385	.28	109.47
October				12	.60	7.20
				<u>397</u>	.29	116.67
Christmas trees						
December			143.00			120.00
Margin on handling						348.00
			<u>143.00</u>			<u>468.00</u>
Grand total			\$18,137.15			\$20,760.47

TABLE 41: FARM NUMBER 4: BUSINESS ANALYSIS RECORD
ON NEWLY DEVELOPED MUCK FARM
Erie County, N. Y.

Year ending December 31, 1949. Total acres owned, 148; upland: 113, muck: 35, woods: 15. Elevation 868'. Upland soil type, Groton loam. Slope, Hummocky. Drainage, excessive to good. 3 miles to village, 19 to city.

Crops					
Kind	Acres	Yield per acre	Sales		
			Amount	Price	Value
Muck					
Celery	12	796 dozen bunches	9,552	\$.62	\$ 5,951
Onions	4	894 dozen bunches	3,574	.45	1,616
		219 50 lb. sacks	877	2.65	2,328
Carrots	10	577 dozen bunches	5,769	.49	2,805
		47 bushels	472	.87	410
Radishes	5	658 dozen bunches	3,288	.36	1,190
Spinach	5	125 bushels	627	.95	593
Lettuce					
Curly	2	316 8-lb. flats	631	.66	419
Boston	.5	68 2 dozen heads	34	1.25	42
Iceberg	.5	118 2 dozen heads	59	1.51	89
Upland					
Potatoes	18	128 bushels	2,298	1.47	3,373
Asparagus	2	1,567 pounds	3,134	.19	607
Dill	.5	784 bushels	392	.88	344
Cucumbers	4	69 bushels	276	1.01	278
Sweet corn	1	397 dozen ears	397	.29	117
Wheat	15	11 bushels	158	1.90	300
		ton (straw)	2	15.00	30
Total	79.5				\$20,492
Second crop	10.0				
Difference	69.5				

TABLE 11: FARM NUMBER 14: BUSINESS ANALYSIS RECORD
ON NEWLY DEVELOPED MUCK FARM (con'd)
Erie County, N. Y.

Farm Expenses		Farm Expenses (con'd)	
Hired labor		Repairs	
Regular help, boarded		Truck	\$ 262
48 weeks @ \$30	\$1,432	Machinery	434
board	230	Fertilizer, lime	1,941
14 weeks @ \$15	213	Seeds, plants	1,760
board	70	Spray material and	
17 weeks @ \$13	222	weed control	786
board	85	Bags, boxes	1,329
Regular help, with dinner		Soil testing	30
19.4 weeks @ \$25	485	Stationery, stamps	25
dinners	97	Interest for current	
28.4 weeks @ \$29.50	839	use of money	96
dinners	167	Market fees	265
128 days @ \$2.50	320	Taxes, land and school	444
dinners	58	Telephone	140
Women and others		Electricity	125
684 days @ \$5.00	3,420	Farm dues, papers	17
Father on market		Total	\$21,348
6 months	600		
Transportation of help	378		
Building repairs	155		
Insurance			
Labor	249		
Accident	66		
Fire	101		
Truck	102		
Collision	28		
Auto 1/2	38		
Freight	21		
Machines hired			
Baler	12		
Combine	113		
Gas and oil	1,288		
Equipment purchased			
Cub tractor	850		
Fertilizer attachment	70		
Power shovel	1,161		
Elevator	372		
Small tools	111		
Other	234		
Licenses			
2 trucks	85		
Truck	4		
Auto	18		

Inventory of Farm Capital

	Jan. 1, 1949	Dec. 31, 1949
148 acres	\$20,000	\$20,000
Machinery	10,817	12,600
Supplies	1,000	1,000
Total	\$31,817	\$33,600
Average capital	\$32,708	

Financial Summary

Receipts	
Increase in capital	\$ 1,783
Crops sold	20,492
Christmas trees	468
Muck soil, 303 bushels	130
Outside work	1,100
Scrap iron	81
Patronage dividends	2
Total	\$24,056
Expenses	21,348
Farm income	\$ 2,708
Interest on capital @ 5%	1,635
Labor income	\$ 1,073

Farmer 4 has not found, as yet, the best combination of vegetables for his conditions. This year he plans to cut out potatoes because his yields have been too low. He has a considerable area of upland soil that could be used for sweet corn. Being outside the market garden area, he is not well located to attract truckers who buy in large units at the farm.

Dr. Paschal reported that farmers who sold a large volume of produce marketed their crops in larger loads than did the others. In 1932 and 1933 it cost only 35 cents more to market a \$30 load than to market a \$10 load. 1/

The price index for vegetables sold from this farm was 170 when 1935-40 prices as given in table 48 were called 100. Except for celery, his prices were comparable to those received by the other two farmers. He received only about one-half as much per dozen stalks for celery.

This young man handled his labor well. His labor costs per man equivalent and per output unit were below the cost on the other farms. As measured by work units, his labor accomplished the most per man, while his output units per man of 239 were higher than farm 3 but not as high as the cost account farm. All costs, including his own labor and interest on the farm capital, amounted to \$16.73 per output unit which was about \$3 less than the cost on the other two farms.

The weakness on this farm is the low return of \$15.49 per output unit, which is \$3.51 less than on farm 3 and \$6.63 less than on the cost account farm. This factor can be improved by a better combination of vegetables, better production, and better prices for celery.

MARKET GARDEN FARM 3

A visit was made by a farm management class to this farm in 1938. This farmer spent an evening with us and answered specific questions about his farm business. His father was the first market gardener in the community to irrigate, using an old steam pump.

It is relatively easy to get a business record on this farm because the accounts are well summarized. The sales are kept by listing the quantities of each vegetable loaded on the truck. After the load is sold, the prices are recorded. The wife enters this information in the account book and, at the end of the year, totals the sales for each vegetable as well as each item of expense.

Before starting to farm here in 1923, this farmer spent two years in the Army in World War I, did carpenter work for a while, studied electrical engineering, and worked for Westinghouse in Pittsburgh. For the past 10 years he has been operating the farm in partnership with a son. A second son who last year finished the four-year agricultural course at Cornell is now at home, and another son is studying at Alfred. They all plan to be market gardeners.

1/ Cornell Bulletin 673 (see reference following table 45)

TABLE 42: FARM NUMBER 3: BUSINESS ANALYSIS RECORD

Erie County Market Garden Farm

For Year Ending December 31, 1949

Kind	Acres	Yield per acre	Unit	Crops		
				Sales		
				Amount	Price	Value
Beans, snap						
Early	.50	*	bushels	29	\$1.50	\$ 44
Late	1.00	329	bushels	329	1.50	494
Beets						
Early	.50	*	dozen bunches	626	.65	407
Late	1.00	1,566	dozen bunches	1,566	.50	783
Greens	.10	*	bushels	45	1.00	45
Broccoli, set out	.25	*	8-quart baskets	224	.75	168
Cabbage						
Early	1.00	1,026	bushels	1,026	.90	923
Late	6.00	9.5	tons	57	30.00	1,711
Red	.10	*	bushels	88	.75	66
Carrots	3.00	1,283	dozen bunches	3,849	.65	2,502
Cauliflower						
Early	1.25	350	dozen heads	438	1.50	657
Late	5.00	621	bushels	3,107	1.25	3,884
Celery	10.00	833	dozen bunches	8,333	1.50	12,499
Cucumbers	.50	*	bushels	112	2.00	225
Lettuce						
Boston & leaf	.25	*	dozen heads	478	.50	239
Iceberg	4.00	456	dozen heads	1,824	.90	1,642
Muskmelon	.25	*	bushels	73	1.50	110
Peas						
Early	1.00	213	bushels	213	3.00	639
Late	1.00	4	bushels	4	2.00	8
Radishes						
Early	1.00	1,433	dozen bunches	1,433	.30	430
Winter	.10	*	bushels	38	1.50	57
Raspberries	1.00	636	pints	636	.25	159
Spinach						
Early	2.00	196	bushels	392	.90	353
Late	8.00	406	bushels	3,249	.81	2,632
Squash, summer	.25	*	8-quart baskets	714	.50	357
Sweet corn						
Early	2.00	438	dozen ears	876	.60	526
Late	2.00	473	dozen ears	946	.30	284
Swiss chard	.10	*	dozen bunches	33	1.50	50
Tomatoes						
Factory	10.00	14	tons	143	23.00	3,284
Staked	1.25	4,335	8-quart baskets	5,419	1.00	5,419
Field	1.00	466	bushels	466	1.67	781
Plants						
Tomatoes, etc.			dozen	640	.25	160
Flowers			dozen	764	.25	191
Oats	20.00	30	bushels	575	.60	345
	85.40			Total value		\$42,074

* Less than one acre.

Erie County Market Garden Farm
For Year Ending December 31, 1949

<u>Farm Expenses</u>		<u>Inventory of Farm Capital</u>
Hired labor		Jan. 1, Dec. 31,
84.8 weeks @ \$36	\$ 3,054	1949 1949
32.5 weeks @ \$42	1,365	56 acres land \$22,000 \$22,000
Sons - 14.5 months	2,700	3 tractors 3,000 3,200
Colored help @ 75¢ an hour	2,303	2 trucks 2,000 1,800
Women @ 65¢ an hour	5,148	Other equipment 5,000 5,000
Boys, girls @ 60¢ an hour	3,360	Supplies, packages 2,000 2,000
Market helper @ \$1.50 an hour	234	Total capital \$34,000 \$34,000
Building repairs	173	
Insurance		
Fire	240	
Trucks	110	
New equipment		
Tractor	793	
Steam boiler	635	
Other	437	
Repairs, machinery	1,451	
Gas and oil	1,564	
Truck licenses	104	
Rental, cold storage	503	
Freight	21	
Crates, packages	4,184	
Fertilizer and lime	3,149	
Seeds, plants	1,157	
Spray materials	500	
Taxes - land, school	673	
Water tax	490	
Telephone	74	
Electricity	110	
Market rental	150	
Interest	196	
Rent of land	695	
Total	\$35,573	
Elevation 800'		
Location: 1/2 mile to town, 8 miles to city		

<u>Financial Summary</u>	
Receipts	
Crop sales	\$42,074
Gas tax refund	159
Total	\$42,233
Expenses	35,573
Farm income	\$ 6,660
Interest on \$34,000 @ 5%	1,700
Labor income - 2 operators	\$ 4,960
Labor income per operator	\$ 2,480

<u>Land</u>	<u>Acres</u>
Owned	56
Rented	90
Total	146
Use of land	
Cropped	85
Double cropped	10
Difference - used for crops	75
Rye grass	3
Grass cover crop	15
Tree plantings	5
Waste, woods, idle, etc.	48
Total	146

Soil types, drainage good: Palmyra gravelly loam, Wooster gravelly loam, silt loam, and muck (3 acres)
Drainage very poor: Toledo silt loam

TABLE 43: FINANCIAL SUMMARY AND
BUSINESS ANALYSIS FACTORS
3 Market Garden Farms, 1949, Including 1938 For Farm 3

Items	Cost account farm	Farm 4	Farm 3	
	1949	1949	1949	1938
<u>Financial Summary</u>				
<u>Operator's farm capital</u>				
Real estate	\$57,272	\$20,000	\$22,000	\$ 9,958
Equipment	22,094	11,708	10,000	2,388
Livestock, supplies, etc.	15,026	1,000	2,000	325
Total capital	\$94,392	\$32,708	\$34,000	\$12,671
<u>Operator's financial summary</u>				
Receipts	\$72,996	\$24,056	\$42,233	\$13,293
Expenses	48,355	21,348	35,573	8,536
Farm income	\$24,641	\$ 2,708	\$ 6,660	\$ 4,757
Interest on farm capital	4,720	1,635	1,700	634
Labor income	\$19,921	\$ 1,073	\$ 4,960	\$ 4,123
Labor income per operator	\$ 4,980	\$ 1,073	\$ 2,480	\$ 4,123
<u>Business Analysis Factors</u>				
<u>Size of business</u>				
Acres				
Owned	137	148	56	31
Rented	68	0	90	25
Cropped	198	70	85	39
Work units	3,379	2,120	1,948	1,438
Output units				
Vegetables	2,577	1,497	2,017	1,368
Greenhouse	376	0	175	60
Berries	61	---	11	---
Hay and grain	64	12	20	5
Livestock	321	---	---	14
Outside labor	1	44	---	---
Total output units	3,300	1,553	2,223	1,447

TABLE 43: FINANCIAL SUMMARY AND
BUSINESS ANALYSIS FACTORS (con'd)
3 Market Garden Farms, 1949, Including 1938 For Farm 3

Items	Cost account farm	Farm 4	Farm 3	
	1949	1949	1949	1938
<u>Business Analysis Factors (con'd)</u>				
<u>Leading vegetables*</u>				
Per cent of vegetable work units on:				
Sweet corn	13	**	2	1
Cauliflower	13	0	7	14
Celery	7	29	29	33
Carrots	0	25	9	9
Radishes	0	12	3	0
Onions	0	11	0	0
Tomatoes	10	0	11	3
Lettuce	9	6	10	4
Beets	1	0	7	18
Other	47	17	22	18
	100	100	100	100
<u>Vegetable factors</u>				
Vegetable sales	\$62,564	\$20,162	\$41,570	\$13,261
Sales per output unit	\$21.93	\$13.47	\$18.96	\$9.29
Vegetable yield index	95	73	118	101
Vegetable price index	185	170	226	113
Number of vegetables	22	11	17	13
<u>Labor</u>				
Man equivalent				
Number of operators	4.0	1.0	2.0	1.0
Hired labor	8.4	5.5	8.4	5.1
Total	12.4	6.5	10.4	6.1
Labor cost				
Operators' time	\$12,000	\$ 3,000	\$ 6,000	\$ 2,500
Hired labor	16,997	8,238	18,164	3,902
Total cost	\$28,997	\$11,238	\$24,164	\$ 6,402
Cost per man equivalent	\$2,338	\$1,729	\$2,323	\$1,050
Labor accomplishment				
Work units per man	272	326	187	236
Output units per man	266	239	214	237
<u>Per output unit</u>				
Interest on farm capital	\$ 1.43	\$ 1.05	\$.77	\$.44
Labor cost	8.79	7.24	10.87	4.43
Other costs	9.50	8.44	7.83	3.20
Total cost	\$19.72	\$16.73	\$19.47	\$ 8.07
Receipts	22.12	15.49	19.00	9.19
Profit	\$ 2.40	-\$ 1.24	-\$.47	\$ 1.12

* Vegetables that amounted to 10 per cent or more of the total output units on one or more farms.

** Less than 1 per cent.

Since we were there in 1938, they have added 27 acres at a cost of \$8,000.

After the farm expenses are paid, the father and son divide the amount left equally. In 1949 each had \$3,832. As summarized in table 42, after deducting interest on the farm capital, each had a labor income of \$2,480. Labor incomes vary from year to year depending upon the yield and price of vegetables, as well as costs. In 1938, when the father operated the farm alone, the students calculated his labor income as \$4,123.

Factors for this farm are given in the last two columns in table 43. As measured by work units, the business was 29 per cent larger in 1949 than in 1938. The vegetable yields were, on the average, 17 per cent higher in 1949, and vegetable prices, 100 per cent higher. On the other hand, wage rates were more than twice as high in 1949, and the accomplishment of labor, as measured by output units per man, was only 214 in 1949 compared with 237 in 1938, a decrease of 10 per cent. This seems to be the weak factor in their 1949 business.

It is the policy of the father to let the sons assume responsibilities. Apparently, the labor was not as efficiently used in 1949 as in 1938.

The Capitol District

This department made a Farm Management survey of 149 vegetable farms in the capitol district for the year 1937. Compared with the Market Garden cost account farm, most of their farm businesses were small.

The acreage in vegetables per farm varied from 4 to 75, the median average being 15. Only 13 of the 149 farmers had more than 37 acres of vegetables which was the acreage in 1937 on the cost account farm.

On the average, these farmers valued their farms at \$162 per acre. The cost account farm was valued at about \$100 more. The land and buildings on this farm were inventoried in 1937 at \$22,515 (table 44). Only 4 farms in the capitol district study were valued for as much as \$20,000, and two-thirds of them for less than \$10,000.

The tomatoes sold from the 149 farms brought over \$50,000. Next in importance was asparagus with sales of over \$40,000. The sales from sweet corn, peppers, snap beans, spinach, and cabbage each accounted for over \$20,000 and sales of over \$10,000 were obtained from carrots, cauliflower, celery, and melons. The returns from these 11 most important vegetables accounted for three-fourths of all vegetable sales.

The yield index on the cost account farm was 205 and the price index 119 when the averages for the 149 farms are expressed as 100. Only 16 farms had a yield index above 150.

TABLE 44: BUSINESS ANALYSIS FACTORS
 149 Vegetable Farms in Capitol District and Cost Account Farm, 1937

Factors	Albany District, N. Y.*		Market Garden cost account farm
	Average per farm		
	149 farms	6 farms**	
<u>Size of business</u>			
Total acres	56	119	82
Acres of cropland	32	67	61
Acres used for vegetables	18	35	37
Work units	479	860	1,078
<u>Capital</u>			
Land, buildings***	\$8,210	\$12,441	\$22,515
Livestock	652	921	2,618
Trucks, tractors, autos	492	1,085	744
Other equipment	529	1,173	3,397
Feed, supplies	32	86	1,088
Total capital	\$9,915	\$15,706	\$30,362
Value real estate per acre	\$162	\$123	\$275
<u>Leading vegetables</u>			
Asparagus			
Number of farms	95	4	
Acres per farm	2.5	2.9	0
Dozen bunches per acre	129	163	
Price per dozen bunches	\$1.32	\$1.36	
Beans, snap			
Number of farms	113	4	
Acres per farm	2.2	6.2	1.4
2 1/4-quart baskets per acre	131	209	325
Price per 2 1/4-quart basket	\$0.68	\$0.71	\$0.92
Beets			
Number of farms	81	3	
Acres per farm	0.6	0.7	1.0
Dozen bunches per acre	930	4,430	1,487
Price per dozen bunches	\$0.20	\$0.21	\$0.47
Cabbage			
Number of farms	115	6	
Acres per farm	2.2	3.9	3.5
10-peck barrels per acre	120	202	200
Price per 10-peck barrel	\$0.88	\$0.93	\$1.21
Carrots			
Number of farms	101	5	
Acres per farm	0.9	1.9	0.25
Dozen bunches per acre	1,110	2,487	838
Price per dozen bunches	\$0.16	\$0.19	\$0.20
Melons			
Number of farms	69	3	
Acres per farm	1.6	4.2	5.1
Bushels per acre	190	182	351
Price per bushel	\$0.81	\$0.62	\$1.00

TABLE 141: BUSINESS ANALYSIS FACTORS (con'd)
 149 Vegetable Farms in Capitol District and Cost Account Farm, 1937

Factors	Albany District, N. Y.*		Market Garden cost account farm
	Average per farm		
	149 farms	6 farms**	
<u>Leading vegetables (con'd)</u>			
Peppers			
Number of farms	123	5	
Acres per farm	1.7	2.0	1.1
10-peck barrels per acre	127	157	70
Price per 10-peck barrel	\$0.95	\$1.08	\$2.66
Spinach			
Number of farms	65	5	
Acres per farm	2.7	2.8	4.4
Bushels per acre	363	615	380
Price per bushel	\$0.39	\$0.37	\$0.54
Sweet corn			
Number of farms	128	6	
Acres per farm	4.6	10.1	10.2
100 ears per acre	46	85	65
Price per 100 ears	\$0.92	\$0.89	\$1.53
Tomatoes			
Number of farms	136	5	
Acres per farm	2.3	2.8	2.5
24-quart baskets per acre	271	304	400
Price per 24-quart basket	\$0.66	\$0.63	\$0.63
<u>Vegetable factors</u>			
Number of vegetables****	12	14	20
Yield index	100	147	205
Price index	100	102	119
<u>Labor</u>			
Man equivalent	2.6	3.9	5.1
Cost of labor			
Hired	\$ 682	\$1,602	\$1,895
Unpaid	<u>1,411</u>	<u>1,517</u>	<u>2,525</u>
Total	\$2,093	\$3,119	\$4,420
Cost per man equivalent	\$805	\$800	\$867
Accomplishment per man			
Work units	181	228	211
Vegetable sales	\$943	\$1,728	\$2,146
Labor income	-\$348	\$2,438	\$2,241

* "Farm Management Survey, 149 Vegetable Farms, Capitol District, 1937", by C. A. Bratton - A. E. 241, January, 1939

** These were the only six farms that had a total of 500 or more work units, 190 or more work units per man, and a vegetable crop index of 114 per cent or higher.

*** The value of additional land rented was not always included in the capital.

**** Vegetables with less than five man work units omitted.

The labor other than that of the operator amounted to less than 1 man equivalent on 49 farms. On the 12 farms where the most labor was used, the man equivalent varied from 5.0 to 12.9. The man equivalent on the cost account farm was 5.1, and the vegetables sold per man equivalent came to \$2,146. On only 5 capitol district farms did the sales per man amount to \$2,000.

The six farms that had a total of 500 or more work units and at least 190 per man, and a crop index of more than 114 per cent compared favorably in all the important factors with the cost account farm. The labor incomes on these six farms varied from \$1,163 to \$4,967, averaging \$2,438 which was approximately the labor income made on the cost account farm. Only 5 of the 149 farmers made a labor income as high as \$2,000, and 106 failed to make a labor income. That is, the farm expenses, value of family labor, and interest on the farm capital exceeded the farm receipts.

Factory employment and vegetable prices declined during the last half of 1937 reducing the income on the market garden farms. However, the low returns indicate that market gardening is highly competitive.

Rochester Area

The study of market garden farms in the Rochester area under the direction of Dr. E. G. Misner was made during the depression of the early thirties. A few of the farms were large, but most of them were small with a higher value than the farms in the Capitol district.

The farms with greenhouses in the Rochester area were valued around \$20,000 which included \$5,000 for the greenhouses. Since the acreage averaged only 15, it made a value per acre of over \$1,300. Many of these farms had a value for subdividing into lots that was far beyond their agricultural value. Some were within the city limits of Rochester. The farms without greenhouses were larger, averaging around 40 acres and were valued at \$11,000.

In 1932, on the 197 farms, the farm expenses including \$384 per farm for unpaid labor exceeded the receipts by \$86. In that year, on the average, nothing was left either for interest or for the operator's labor.

In 1933 vegetable prices were 16 per cent higher than in 1932 and, with costs somewhat less, the receipts exceeded the farm expenses by \$471. This was equal to 2.8 per cent on the farm capital of \$16,903 but left nothing for the operator's labor.

In 1934 only the farms with greenhouses were studied and they paid about the same, on the average, as they did the year before.

TABLE 45: OPERATORS' LABOR INCOMES, 1932-34, 1937
Market Garden Farm Surveys and Cost Account Farms

	Rochester area 1/			Albany area
	197 farms 1932	142 farms 1933	50 farms 1934	149 farms 1937
Per cent of labor incomes in indicated intervals				
-\$5,750 to -\$2,000	11	3	4	5
-1,999 to -1,000	36	22	20	17
-999 to -500	21	16	16	23
-499 to 0	12	27	18	26
1 to 499	11	15	18	12
500 to 999	5	9	4	5
1,000 to 1,999	3	5	14	9
2,000 to 4,970	1	3	6	3
	100	100	100	100
Mean average, labor income				
Rochester area	-\$857	-\$309	-\$115	-\$348
Market Garden cost				
account farm	\$1,517	-\$969	\$243	\$2,241
All cost account				
farms	-\$1,464	\$726	\$310	\$365

1/ "Economic Studies of Vegetable Farming in New York"

I Market Garden Farms with Greenhouses, Rochester area.
G. A. M. Baptist and E. G. Misner, Bulletin 671, 1937

II Market Garden Farms without Greenhouses, Rochester area.
J. L. Paschal, Bulletin 673, 1937

Cornell University, Agricultural Experiment Station, Ithaca, N. Y.

In 1932 the 64 farmers keeping cost accounts with this department lacked, on the average, \$1,464 of having a labor income (table 45). In that year the Market Gardener did the best of the cost account farmers with a plus labor income of \$1,517. However, his turn came the next year when in 1933 he failed to make a labor income by \$969. This is the only year that the Market Gardener failed to make a labor income.

Labor Incomes

The farmers who co-operate with the College in keeping cost accounts are selected. Cost account farms are usually larger, often on more productive soil and frequently have better markets than the average.

The two brothers on the Market Garden Farm began farming just before the outbreak of World War I. By 1916, prices were rising rapidly. In that year the labor income amounted to \$4,025 if the time of one brother was valued at \$650. The labor incomes of all the cost account farms during these years of war prices averaged nearly \$2,000 (figure 11).

Prices collapsed in 1921 and the labor incomes for the next four years on the cost-account farms averaged less than \$300. But the labor income on the Market Garden Farm continued at about the \$4,000 level. Nearness to market is an advantage in depression years when farm prices are very low and freight and marketing costs are still high.

From 1925 to 1928 the price level was stable and the cost account farmers adjusted their businesses so as to make labor incomes of about \$1,000. On the Market Garden Farm, the brother's time had been increased to \$1,500 and the labor income continued around \$4,000.

Then came the price collapse of the thirties. This was so severe that the farm expenses and the interest on the farm capital usually exceeded the farm receipts. In 1932 minus labor incomes occurred on 51 of the 64 cost account farms. On six of the farms, the receipts were more than \$4,000 short of meeting expenses and interest on the farm capital.

In 1933 the Market Gardener failed to make a labor income and for several years his labor income was less than the wage paid his hired man. However, his labor incomes from 1930 to 1934 averaged \$437 which was \$855 higher than the average of all cost account farms.

From 1935 until the outbreak of World War II the relationship between farm receipts and costs improved and the cost account farmers were again making labor incomes averaging around \$1,000 and the Market Gardener nearly \$4,000.

Labor incomes
dollars

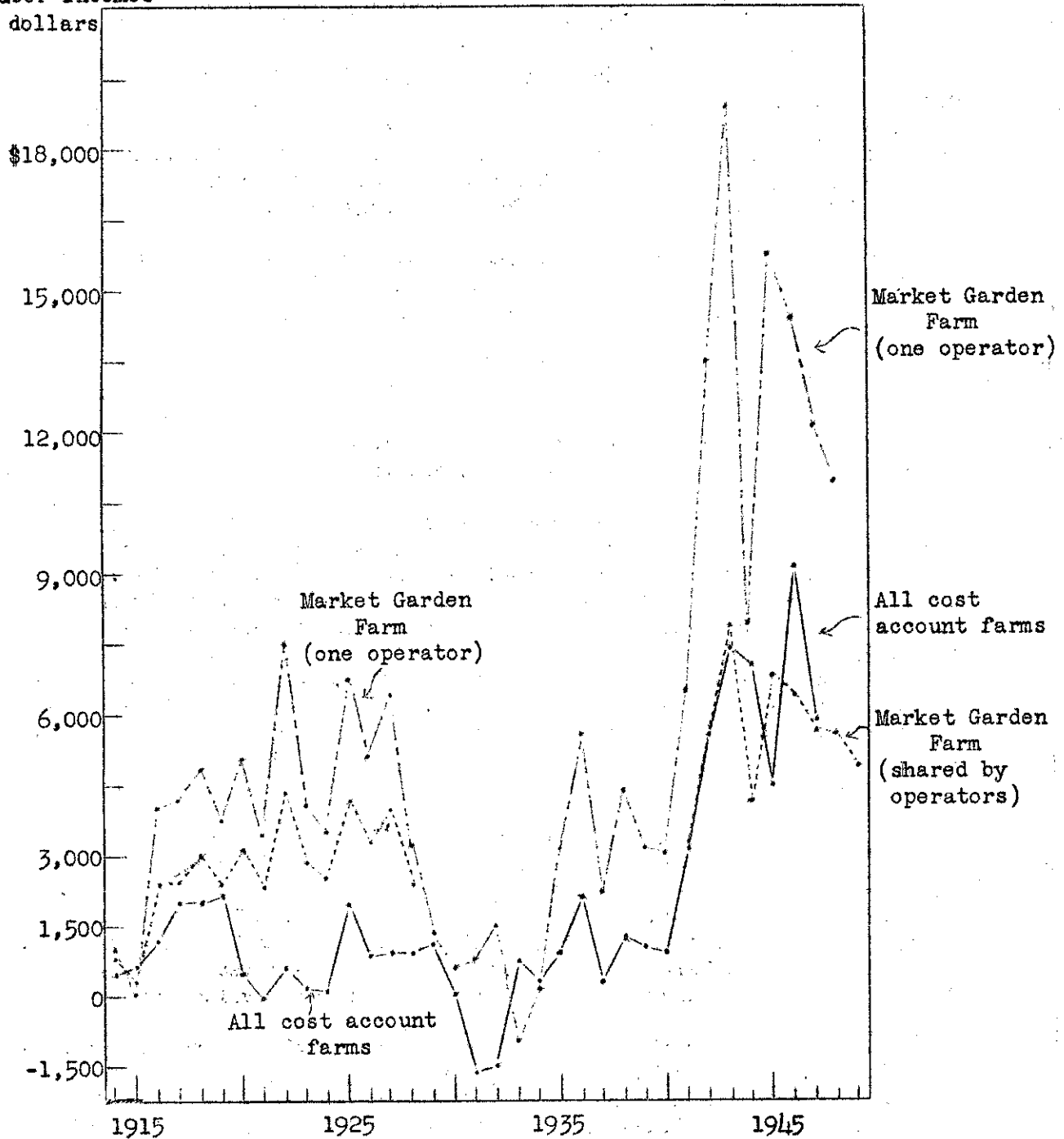


Figure 11: LABOR INCOMES TO ONE OPERATOR AND SHARED BY OPERATORS, MARKET GARDEN FARM AND THE AVERAGE FOR ALL COST ACCOUNT FARMS, 1914-49

For 29 of the 35 years the labor income on the Market Garden Farm was more than twice the average of all cost account farms.

Then came the financing of World War II which caused the greatest agricultural boom in our history. During 1941 to 1948, the labor incomes on the cost account farms averaged \$6,221 and were more than three times as large as those made during World War I. The labor incomes made on the Market Garden Farm were still twice as high as the cost account average. The reason for large labor incomes during inflation is that the prices for the produce that the farmer sells increase faster than do the prices for the things he buys.

During the 36 years that the Market Gardener has kept cost accounts, his labor income has been the highest of the cost account farms in 7 years and has exceeded the cost account average in 32.

Partnerships

Most of the larger farms keeping cost accounts with the College have two operators, the father and son combination being the most common.

In 1947 the labor force on 22 cost account farms exceeded a man equivalent of 3.75. A landlord lived on one of these farms, did some supervising, but the farm was worked on shares by a non-relative. Three farms were operated by managers, the owners doing some supervising and work but having full-time jobs off the farm. Three were operated by brothers and twelve by a father-son combination. Thus, only three farms are left that were managed by only one operator. On the other 28 farms where the man equivalent was less than 3.8, only one was a father-son combination; the other 27 were operated by the owner without a partner. Only on larger farms is the income likely to be sufficient to attract a second member of the family.

The method used in calculating labor income on cost account farms having two operators has been to include the value of the time of one operator in the expenses and calculate the labor income of the other. For comparing the relative profitableness of a farm, this is the correct procedure if one of the operators performs only the work of a hired man. This method on the Market Garden Farm gave an average labor income of \$4,212 from 1914-28 when the other brother's time was valued at \$1,162.

However, each brother had business and managerial responsibilities. Probably neither would have made a labor income of \$4,212 without the other. Operating alone, one could not have been on the market and on the farm at the same time. It is more realistic to say that together they made a labor income of \$5,374 or \$2,687 per brother.

In 1914 the labor of each brother was valued at \$600 and by 1928 this had been increased to \$1,500. In 1914 their father's time had been valued at \$500 but by 1928 he had retired to the extent that his labor was estimated to be the equivalent of three months, valued at \$300.

The partnership was a success. On the average, after deducting interest at 5 per cent on the farm capital and the value of their father's and mother's work, board furnished hired help, and all other expenses, there was left from the receipts for each brother an average of \$2,687 per year. The brothers decided to divide the farm and operate separately in 1929.

This necessitated another set of buildings. A house was built at a cost of \$11,000 and a greenhouse and barn for an additional \$4,200. This increased the investment in real estate from \$25,000 to over \$40,000 and added about \$1,800 to the annual building charge without any corresponding increase in returns. The duplication of equipment was postponed. Except for trucks, the machinery was undivided and each bought his own new equipment as the old was replaced.

In 1929 prices collapsed and partnerships are difficult if there is little or nothing to divide but debts. From this point of view, 1928 was an opportune time to dissolve the partnership.

Considering the severity of the depression, they did well during the thirties. One brother's labor income averaged about \$1,000 and the other about \$2,000.

One reason for separating the business was the differences in outlook due to children. One brother had four, the other none. The brother with the children required a larger income, had more help, and had three reasons for expanding the business. The three are now his partners.

The farm is, of course, over-staffed with operators. But, at any time, the eldest son's farm could be run separately from the home farm.

The responsibilities are divided. The eldest son does the marketing and is the salesman. The second son lays out the work. The help is usually divided into two or three groups. It is desirable for one of the operators to be with each group. The third son has charge of the poultry. He has a challenge to put this enterprise on a paying basis. The father is the chairman. If the sons cannot agree, they look to their father for the final decision.

After all farm expenses have been paid, each partner has shared alike in the returns except that the eldest son received interest on the value of his farm. In 1949 each received between \$4,000 and \$5,000. They have received annually about this amount since the partnership was started in 1941. In boom times when there is more to divide than anyone expected, satisfaction is likely to be general.

In 1949 the time of each operator was valued at \$3,000. If the father had paid the sons at this rate, he would have made a labor income of \$10,921 (table 46).

TABLE 46: CHANGES IN OPERATORS BY PERIODS, 1914-48
Market Garden Farm

Factors	Two brothers 15 years 1914-28	One brother 12 years 1929-40	Father, 2 sons 8 years 1941-48	Father, 3 sons 1 year 1949
<u>Labor force</u>				
Operators	2.0	1.0	3.0	4.0
Other labor	<u>2.2</u>	<u>3.6</u>	<u>7.6</u>	<u>8.4</u>
Man equivalent	4.2	4.6	10.6	12.4
<u>Cropland</u>				
Original farm	85	62	62	62
Purchased in 1944	--	--	40*	64
Cash rental	<u>--</u>	<u>--</u>	<u>46</u>	<u>72</u>
Total	85	62	148	198
<u>Operators' farm capital</u>				
Land	\$13,805	\$ 9,331	\$14,797	\$20,247
Buildings and improvements	13,015	13,392	25,387	37,025
Irrigation system	-----	983	4,569	7,008
Livestock	2,558	1,878	4,414	5,087
Machinery, equipment	3,507	1,959	7,500	15,086
Supplies, fall plowing, etc.	<u>2,722</u>	<u>1,099</u>	<u>5,149</u>	<u>9,939</u>
Total capital	\$35,607	\$28,642	\$62,316	\$94,392
<u>Operators' income</u>				
Income, farm capital and operators' labor	\$7,154	\$3,540	\$20,283	\$24,641
Interest on farm capital @ 5%	<u>1,780</u>	<u>1,432</u>	<u>3,116</u>	<u>4,720</u>
Labor income, all operators	\$5,374	\$2,108	\$17,167	\$19,921
Labor income per operator	2,687	2,108	5,722	4,980
Value of partners' time	1,162	-----	4,638	9,000
Labor income for one operator	4,212	-----	12,529	10,921

* Purchased in 1944, 64 acres of cropland; 64 acres for five years and no acres for three gives an average of 40 acres for eight.

An exchange teacher from England spent a year as an agricultural high school instructor in this community and frequently visited this farm. The following from his article in "The Countryman", London, England, aptly describes these people.

"With but two exceptions, the thirty or so farms are owned and worked by families of almost pure German-cum-Alsatian descent, who have become sufficiently American in their outlook to be progressive and remain German enough to be hardworking and thrifty. Furthermore, they manage to infuse the male members of their large families with a love of the land and an intelligently scientific interest in it."

TABLE 47: WEIGHTS PER UNIT FOR FRUITS, VEGETABLES, AND OTHER CROPS

Commodity	Unit	Approximate net weight	Commodity	Unit	Approximate net weight
		Pounds			Pounds
Alfalfa seed	bushel	60	Carrots	bunch	1.5
Apples	4-quart*	7.4		doz. bunches	18
	8-quart*	13.7	(topped)	bushel	50
	1/2 bushel*	26	Cauliflower	head	4
	bushel	48		1/2 bushel	25
	egg crate	60		18-20 head crate	75
	orange crate	70	Celery	stalk	1
	box (1)	144	hearts	bunch	1
McIntosh**			green	bunch	2
Apples	Size			doz. stalks	12
285	2 1/4"	box (2)		2/3 crate (4)	90
195	2 1/4-2 1/2"	" "		1/2 crate	65
156	2 1/2-2 3/4"	" "	Cherries	quart	1.5
107	3"	" "	with stems faced "		1.8
Newtown Pippin	" "	50	with stems	12-quart	18
R. I. Greening	" "	46	" "	bushel	56
McIntosh	" "	42	without stems	bushel	64
Duchess	" "	40		flat box (5)	15
Asparagus	bunch	2	Chicory	bushel	25
	doz. bunches	25	Chives	quart	1.5
	crate	30	Clover seed	bushel	60
Barley	bushel	48	Corn		
Beans			28# grain, 7# cob "		35
Lima, dry	bushel	56	shelled	bushel	56
Others, dry	bushel	60	green, sweet	bushel	35
Lima, unshelled	bushel	32	green, sweet	doz. ears	12
Snap	bushel	30	Cucumbers	each	0.5
Lima, shelled	quart	2.5		bushel	48
Lima, pods	2 quarts	2.5			
Beets	bunch	1.5			
(topped)	doz. bunches	18			
Blackberries	bushel	52			
Bluegrass seed	24-qt. crate	36			
Brussel sprouts	bushel	14-30			
Broccoli	16-qt. crate	30			
	bunch	3.5			
	doz. bunches	42			
	16-qt. crate	30			
Buckwheat	bushel	48			
Cabbage	head	4			
	bushel	50			
Cantaloup	each	3			
	bushel	50			
	crate (3)	70			

Approximate inside dimensions in inches:

- (1) Western apple box
10 1/2" x 11 1/2" x 18"
- (2) Eastern apple box - 1 1/8 bu.
11" x 14" x 17"
- (3) 13" x 13" x 22 1/8"
- (4) 22" x 16" x 20 3/4"
- (5) 3 3/4" x 11 1/2" x 14 1/8"

* Baskets as sold at stand, heaped full.

** McIntosh apples in Eastern box counted and weighed by Prof. R. M. Smock.

TABLE 47: WEIGHTS PER UNIT FOR FRUITS, VEGETABLES, AND OTHER CROPS

(con'd)

Commodity	Unit	Approximate net weight	Commodity	Unit	Approximate net weight
		Pounds			Pounds
Currants, ripe	quart	1.5	Parsnips	bushel	50
	1/2 bushel	30	Peaches	2-quarts	3.5
	32-qt. crate	50		bushel	48
Dill	bunch	1.5	Pears	2-quarts	3.5
	doz. bunches	18		bushel	57
Eggplant	bushel	25	Peas (dry)	bushel	60
	each	2	green, unshelled "		30
	bushel	33	Peppers	bushel	25
Endive	bushel	25	Pickles	100	10
Escarole	bushel	25	Plums, prunes	quart	2
Gooseberries	quart	1.5		bushel	56
	32-qt. crate	50		crate (7)	20
Grapes	quart	1.5		lug (8)	16
	12-quart	18	Potatoes	bushel	60
	bushel	48	Maine	barrel	165
Greens	bushel	25	Pumpkins	each	5
Kale	bushel	18		bushel	50
Kohlrabi	bunch	1.5	Quinces	bushel	48
	doz. bunches	18	Radishes	bunch	1.5
	bushel	45		doz. bunches	18
Lettuce & Romaine	head	1.1		bushel	40
	doz. heads	14	Rutabagas	bushel	56
	24-head crate	25	Raspberries	pint	1
	5-peck basket	38		quart	1.5
	crate (6)	70		24-qt. crate	36
Leaf lettuce			Rye	bushel	56
(Simpson)	2 quarts	1.5	Scallions (see onions, green)		
	bushel	20	Soybeans	bushel	60
Meadow fescue seed	"	24	Spinach	bushel	18
Millet	bushel	50	Strawberries	quart	1.5
Muskmelon (see Cantaloup)				24-qt. crate	36
Oats	bushel	32	Squashes	each	5
Onions (dry)	quart	2		bushel	53
	2-quarts	3.5	Swiss chard	bushel	25
(late)	bushel	57	Timothy seed	bushel	45
(early)	bushel	50	Tomatoes	quart	2
Green	bunch	1		12-quart	24
	doz. bunches	12		bushel	53
	crate (6)	50-55		lug (9)	32
Okra	12-quart	20	Ripe	lug (6 x 6)	30
Orchard grass (seed)			Green	lug (6 x 6)	25
	bushel	14	Turnips	bunch	1.5
Parsley	bunch	0.25		doz. bunches	18
	doz. bunches	3		crate (6)	60-80
	100 bunches	25	without tops	bushel	54
	bushel	20	Watermelon	each	25
			Wheat	bushel	60

Approximate inside dimensions in inches:

- (6) 13" x 18" x 21 5/8" - Western crate
 (7) 4 1/2" x 16" x 16 1/8"
 (8) 3 1/4" x 11" x 18" - suitcase lug
 (9) 5 3/4" x 13 1/2" x 16 1/8"

TABLE 48: STANDARDS USED IN ANALYSING MARKET GARDEN FARM
WORK UNITS, OUTPUT UNITS, YIELDS, AND PRICES

Crop	Days' work per acre (work units)	Unit	Yield per acre	Units per 9-hour day (output units)	Price per unit 1935-40	Cost per unit 1935-40
<u>Vegetables</u>						
Asparagus	20	pounds	2,400	120	\$ 0.10	----
Beans, snap	45	bushels	200	4.5	1.23	\$ 0.96
Beets, early	80	dozen bunches	1,400	17	0.37	0.47
Beets, late	25	bushels	300	12	0.48	----
Beets, factory	16	tons	6	0.4	13.00	----
Broccoli	18	8-qt. basket	450	25	0.40	0.32
Cabbage	12	bushels	400	33	0.63	0.43
Cabbage	10	tons	8	0.8	10.54	----
Cabbage, celery	18	dozen heads	300	17	0.56	0.39
Carrots	50	dozen bunches	1,500	30	0.23	----
Carrots	25	bushels	400	16	0.41	----
Cauliflower	20	bushels	300	15	0.77	0.59
Chard	60	dozen bunches	800	13	0.48	----
Celery	50	dozen stalks*	600	12	0.60*	----
Cucumbers	20	bushels	250	12	1.14	0.78
Endive	80	18 heads	800	10	0.58	0.43
Eggplant	20	bushels	350	18	0.69	0.80
Lettuce	40	dozen heads	2,000	50	0.30	0.20
Muskmelon	15	bushels	250	17	1.14	0.79
Mustard, turnip greens	18	bushels	500	28	0.51	0.32
Onions	50	dozen bunches	2,000	40	0.25	----
Onions	45	50 lb. bag	500	11	0.61	----
Parsley	100	dozen bunches	2,000	20	0.38	0.22
Peas	25	bushels	150	6	1.16	0.97
Peas, factory	20	tons	1	.05	55.00	----
Peppers	18	bushels	250	14	0.94	1.02
Potatoes	10	bushels	200	20	0.59	----
Radishes	50	dozen bunches	1,500	30	0.14	0.13
Rutabagas	10	bushels	200	20	0.73	0.65
Spinach	15	bushels	500	33	0.44	0.37
Squash	10	bushels	200	20	0.78	0.55
Sweet corn	27	dozen ears	500	71	0.14	0.14
Tomatoes	23	bushels	350	15	1.03	0.75
Tomatoes, factory	13	tons	9	0.7	12.00	----
<u>Berries</u>						
Raspberries	35	pints	2,000	57	0.09	0.09
Strawberries	45	quarts	3,000	70	0.11	0.08
<u>Hay and grain</u>						
Corn for grain	2	bu. (shelled)	36	18	0.91	----
Corn for silage	2.5	tons	13	5	----	----
Oats	1.25	bushels	35	28	0.47	0.89
Wheat	1.25	bushels	30	24	0.90	1.41
Hay per cut	1.0	tons	1.7	1.7	9.00	18.40

* When sold as hearts, two stalks counted as one. Price for 1940.