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CANNING FACTORY TOMATOES

Economic Data on Costs and Production

by

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*Prepared by J. F. Harriott.

NEW YORK STATE COLLEGE OF AGRICULTURE

Department of Agricultural Economics and Farm Management

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QUANTITIES USED IN THE PRODUCTION OF TOMATOES

	Cost study		Cost account farms	
	1920	1930	1931	1932
Number of farms	133	9	4	10
Tomato acreage per farm	4.5	6.2	16.0	11.5
Tons of tomatoes per acre	8.7	5.4	6.3	9.5
<u>Quantities per acre</u>				
Plants, number	3377	3638	3045	3200
Fertilizer, pounds	622	867	691	1011
Manure, tons	3	2	1	2
Time growing tomatoes				
Labor, hours	62	38	38	30
Horse work, hours	61	24	19	18
Tractor, hours	1	4	4	4
Truck and auto, miles	2	8	-	9
<u>Quantities per ton</u>				
Time harvesting tomatoes				
Labor, hours	12	14	12	10
Horse work, hours	4	-	-	-
Truck and auto, miles	3	5	5	6

For the year 1920, L. J. Norton studied the cost of growing tomatoes in cooperation with 133 farmers in Orleans, Niagara and Chautauquá Counties. The results of this study were published in Cornell Bulletin 412, "An Economic Study of the Production of Canning Crops in New York".

In 1932, 10 of the 64 farmers keeping cost accounts with this department under the direction of J. F. Harriott grew canning factory tomatoes. Four of the 10 farms were located in Orleans County, 3 in Monroe, 2 in Genesee and 1 in Livingston.

Farmers keeping cost accounts have a larger business, more efficiently operated, and on better land than the average of their neighbors. The cost per ton to grow canning factory tomatoes as shown by the cost account farms is less than the average for the state.

In 1932, the cost account farmers, on the average, used only 30 hours of labor to grow an acre of tomatoes to picking time and only 10 hours per ton to pick and market tomatoes for the canning factory. Because farmers, in 1932, had so little money to hire help, less labor was used than in former years.

In 1920, the study of 133 unselected farms showed that it took 62 hours per acre to grow tomatoes to picking time and 12 hours per ton to pick and harvest the crop. The greater use of tractor and labor saving methods has probably reduced the hours of labor per acre to grow tomatoes since 1920.

ESTIMATED QUANTITIES REQUIRED TO PRODUCE ONE TON OF
TOMATOES WITH A YIELD OF 7 TONS PER ACRE

Cost items	Cost study 1920	Cost accounts 1930-32
Plants, number	482	471
Fertilizer, pounds	86	122
Manure, tons	0.4	0.2
Labor, hours	20.7	17.0
Horse work, hours	13.0	2.9
Tractor, hours	0.1	0.6
Truck and auto miles	3.5	6.1
Use of land, acres	0.14	0.14

The eight items listed above made up 93 per cent of the total cost in 1920 and 84 per cent of the total cost in 1932.

In 1930-32, greater use was made of the tractor and truck than in 1920, but less use was made of horses. On the cost account farms, only 3 hours of horse work were used per ton of tomatoes compared with 13 hours on the farms studied in 1920. The cost account farms used 17 per cent less man labor per ton of tomatoes than did those studied in 1920.

By using quantities listed above, costs at different prices may be estimated.

PRICES FOR PLANTS, FERTILIZER AND LABOR USED IN
GROWING AND HARVESTING TOMATOES

Items	Cost study	Cost account farms		
	1920	1930	1931	1932
Plants, per M.	\$ 6.51	\$ 6.29	\$ 5.54	\$ 5.72
Fertilizer, per ton	44	37	30	21
Manure, per ton	2.00	3.48	2.90	1.91
Cost per hour				
Labor	.42	.41	.31	.25
Horse work	.24	.22	.19	.12
Tractor	1.87	1.06	.62	.76
Cost per milk, auto and truck	.15	.10	.09	.06
Use of land, cost per acre	13.60	5.93	6.69	4.88

On the cost account farms, the cost per hour for labor, horse and tractor work was much lower in 1932 than in 1930. The decrease in the rates per hour were for labor 39 per cent, for horse work 45 per cent and for tractor 29 per cent.

With a yield of 7 tons per acre, the cost to produce one ton of tomatoes in 1920 was estimated at \$22. The quantities used in 1920 at 1932 prices would have cost \$13, or a decrease of about 40 per cent.

CANNING FACTORY TOMATOES

Average costs and returns

	Cost study	Cost account farms		
	1920	1930	1931	1932
<u>Costs per acre</u>				
Growing costs				
Plants	\$ 22	\$23	\$17	\$18
Fertilizer	13	16	10	11
Manure	6	8	2	4
Labor	26	15	13	8
Horse work	15	5	4	2
Tractor	1	5	2	3
Other equipment	6	5	4	3
Use of land	14	6	7	5
All other	2	1	1	2
Total	\$105	\$84	\$60	\$56
<u>Yield per acre</u>				
Tons per acre	8.7	5.4	6.3	9.5
<u>Costs and returns per ton</u>				
Harvesting costs				
Labor	\$ 4.93	\$ 5.48	\$ 3.39	\$ 2.43
All other	1.86	1.44	.78	.56
Total	6.79	6.92	4.17	2.99
Growing costs	12.09	15.56	9.46	5.89
Total cost per ton	18.88	22.48	13.63	8.88
Price per ton	21.29	16.31	14.12	10.21
Gain per ton	\$ 2.41	-\$6.17	\$.49	\$ 1.33
Returns per hour of labor	\$.55	\$.11	\$.33	\$.35

The low average cost of \$9 per ton in 1932 was due to low prices and to the high average yield of 9.5 tons per acre.

Because of greater efficiency and lower prices, labor, horse work and equipment made up a smaller proportion of the cost of producing tomatoes in 1932 than in 1920. Labor, horse work and the use of equipment amounted to 29 per cent of the growing cost in 1932, compared with 46 per cent in 1920.

5.

GPS:JW-2/1/34-40

ESTIMATE FOR YOUR FARM THE COST OF PRODUCING TOMATOES

Operation	Average per acre*	Work on _____ acres of tomatoes for the year 193_____			
		Labor	Horse	Tractor	Truck auto
	man hrs.	hours	hours	hours	miles
Plowing	5.5				
Harrowing (4) times	4.3				
Disking					
Rolling					
Planking	2.3				
Cultipacking					
Putting on cover crop					
Hauling fertilizer	0.7				
Applying fertilizer	3.0				
Hauling plants	2.2				
Taking care of plants	0.8				
Hauling water	0.1				
Marking	1.0				
Setting	18.3				
Resetting	1.5				
Returning flats	0.5				
Cultivating					
2 horses (2.3) times	3.4				
1 horse (3.3) times	10.7				
Hoeing, weeding	5.0				
Hauling and spreading manure	2.5				
Hauling help for setting	0.1				
Summer fallowing	0.1				
Total growing	62.0				

*Average per acre for 133 farms studied in 1920; yield 8.72 tons.

Operation	Average per ton man hrs.	Labor harvesting _____ acres and _____ tons on your farm			
		Labor hours	Horse hours	Tractor hours	Truck miles
Harvesting early crop	0.1				
Hauling crates	0.2				
Picking for factory	9.1				
Hauling	2.1				
Returning empty crates	0.1				
Total harvesting	11.6				

OTHER COSTS AND SUMMARY

Item	Your tomatoes acres _____, tons _____			Growing cost per acre	
	Amount	Price	Value	Your farm	Average 1930-32*
Growing costs					
Plants					\$19
Fertilizer					12
Manure					5
Labor (page 5)					12
Horse work (page 5)					4
Tractor (page 5)					3
Truck & auto (p.5)					-
Use of land					6
Total	XXX	XXX			\$61
Total growing	XXX	XXX		Cost per ton	\$ 9
Harvesting Labor (page 6)					2
Horse work (page 6)					-
Truck & auto (p.6)					1
Total, 80 per cent of all costs	XXX	XXX			\$12
Total costs or 100 per cent	XXX	XXX			15
Tomato sales					14
Profit or loss	XXX	XXX			-1

*Average of costs as shown by cost accounts 1930-32, see page four.

Canning-Factory Tomatoes

Estimated Cash Expenses, and Margins of Returns over
Cash Expenses for 1934.

Usual farm practices assumed.		Expected yield, 7.0 tons.	
Items of cash expense incurred if tomatoes are grown	Quantity or value per acre	Estimated cash expense with:	
		5 acres	20 acres
Plants at \$4 per 1000	3000	\$ 60	\$ 240
Fertilizer	1000 lbs.	55	220
Gas and oil for tractor work at 28 cents per hour	4 hours	6	22
Repairs for tractor at 7 cents per hour	4 hours	2	6
Repairs on other tools used	\$1	5	20
Cost of hired labor at 25 cents			
Growing 2/3 - 3/4 of 30 hours		25	110
Harvesting 2/3 - 9/10 of 80 hours		68	360
Cash expenses operating truck	\$2	10	40
Total cash cost		\$231	\$ 1018
Total returns with tomatoes at \$10 per ton	7.0 tons	\$350	\$ 1400
Margin of returns over cash expenses *		\$119	\$ 382
Margin, if tomatoes are worth \$13		\$224	\$ 802
Margin, if tomatoes are worth \$7		\$ 14	\$ - 38

* This is not profit or gain. It represents the amount left to pay the farm operator for his time on tomatoes, for the work of his horses, the use of land and manure, and for depreciation and interest on machinery and tools.

Canning-Factory TomatoesKinds, Quantities, and Cost of Fertilizer Used
for Canning-Factory Tomatoes on 10 Farms, 1932

Kind	Farms using	Amount used	Total cost
	number	pounds	dollars
Super phosphate	5	65,100	460.52
5 - 10 - 5	2	13,000	129.68
4 - 12 - 4	1	500	6.83
4 - 16 - 4	3	22,900	337.13
Muriate	1	282	6.66
Nitrate of soda	2	7,720	164.93
Sulfate of ammonia	3	6,876	108.28
Average per acre	-	1,011	10.55

Yields and Prices Necessary to Pay Various
Wage Rates for Canning-Factory Tomatoes

Price per ton of tomatoes	Yields necessary to cover all costs other than for labor and leave for each hour of labor:		
	No wage	25 cents	50 cents
	tons per acre		
\$7.00	8	13	26
\$10.00	5	8	12
\$13.00	4	6	8

RANGE OF COSTS OF PRODUCING TOMATOES

Cost per ton	Cost study, 1920		Cost account farms 1930-32	
	Farms number	Yield per acre tons	Farms number	Yield per acre tons
\$8 and less	-	-	4	12
9 to 11	7	16	6	10
12 to 14	19	11	2	5
15 to 17	25	11	2	5
18 to 20	25	9	1	5
21 to 23	18	7	-	-
24 to 26	12	7	2	5
27 to 29	6	5	2	7
30 to 32	6	5	1	6
33 to 35	6	5	-	-
38 to 41	4	3	-	-
45 and over	<u>5</u>	<u>2</u>	<u>3</u>	<u>2</u>
Total	133		23	
Average		8.7		7.1

In 1920, 71 per cent of the farms, 74 per cent of the acreage and 86 per cent of the tonnage was produced at or below a cost of \$23 per ton.

In the cost of producing tomatoes, the most important factor is yield. Because of the unusual yield of 19 tons per acre, 3 of the 133 farmers studied in 1920 produced tomatoes for \$10 per ton.

From 1930-32, about half of the cost account farms produced tomatoes at or below a cost of \$14 per ton. These low costs farms had yields averaging about 10 tons.

TOMATO ACREAGE, YIELD AND PRICE

Year	Total farms number	Farms growing tomatoes number	Percentage growing tomatoes per cent	Acreage for farms growing acres	Yield per acre tons	Price per ton* dollars
<u>Newfane-Olcott area</u>						
1913	89	27	30	2.8	7.7	8
1914	98	31	32	2.6	7.3	9
1915	81	14	17	2.4	4.5	5
1916	88	21	24	1.8	2.1	12
1917	113	51	45	2.0	1.2	26
1918	159	93	59	2.1	4.0	19
1919	156	77	49	1.9	7.4	18
1920	178	98	55	2.0	7.7	24
1921	171	51	30	1.1	7.6	18
1922	178	83	47	2.9	7.1	16
1923	194	97	50	2.3	5.7	16
1924	202	111	55	2.4	6.8	18
1925	172	109	63	2.5	5.4	19
1926	187	97	52	2.3	5.8	21
1927	170	92	54	2.3	6.1	20
1928	149	93	62	2.2	4.1	24
1929	156	90	58	2.1	6.2	20
1930	140	73	52	2.3	3.5	20
1931	156	77	49	2.0	7.0	15
1932	140	51	36	1.5	6.2	15
Average	149	72	46	2.2	5.7	17
<u>Hilton area</u>						
1928	109	12	11	2.6	5.9	16
1929	103	15	15	3.2	10.1	17
1930	109	31	28	4.4	6.2	16
1931	80	23	29	4.7	9.9	13
Average	100	20	20	3.7	8.0	16
<u>Morton area</u>						
1928	28	3	11	4.3	6.7	15
1929	48	19	39	3.1	8.8	15
1930	53	25	47	2.7	8.0	16
1931	54	26	48	3.2	11.5	12
Average	46	18	36	3.3	8.8	15

*Includes market tomatoes sold as well as canning factory tomatoes.

The above data were obtained from farm business analysis taken for 20 years in the Newfane-Olcott area, Niagara County, New York and for 4 years in the Hilton and Morton areas, Monroe County, New York.

PROPORTION OF TOMATO CROP SOLD TO CANNING FACTORY AND
TO MARKET AND AVERAGE PRICES RECEIVED.

Year	Percentage of tomato tonnage sold to		Average price tomatoes sold to		Tomato pro- duction for area when first year equals 100 per cent
	Canning factory. per cent.	Market per cent.	Canning factory dollars per ton	Market cents per bushel	
<u>Newfane-Olcott area</u>					
1926	81	19	15	122	100
1927	83	17	15	112	113
1928	72	28	15	119	78
1929	78	22	15	95	110
1930	83	17	15	108	62
1931	87	13	13	79	96
1932	52	48	9	54	38
Average	77	23	14	98	85
<u>Hilton area</u>					
1928	90	10	15	58	100
1929	92	8	15	84	248
1930	95	5	15	48	414
1931	98	2	13	74	703
Average	94	6	15	66	366

In the Newfane-Olcott area, usually more than three-quarters of the tomato crop has been sold to canning factories. In 1932, the average price received for canning factory tomatoes was only \$9 per ton compared with \$15 from 1926 to 1930. Market tomatoes in 1932 brought the growers about one-half of the 1926-30 average price. In 1932, less than one-half the usual acreage of tomatoes was set in this area.

In the Hilton area from 1928 to 1931, the production of canning factory tomatoes was increased about six times. The production of market tomatoes is less important in Hilton than in the Newfane-Olcott area. In the Morton area, practically all of the tomatoes produced were sold to canning factories.

TOMATO GROWERS SELLING OR NOT SELLING
TO CANNING FACTORIES

Newfane-Olcott area

Year	No tomatoes sold to canning factory		Part or all of crop sold to canning factory	
	Total tons per farm		Total tons per farm	
	Less 5 number of farms	5 and more number of farms	Less 5 number of farms	5 and more number of farms
1926	14	6	12	59
1927	15	3	8	63
1928	15	7	16	43
1929	21	7	6	56
1930	18	3	16	36
1931	22	3	6	45
1932	29	8	2	11
Average	19	5	9	45

About 30 per cent of the Newfane-Olcott tomato growers did not sell to the canning factories. Usually growers who produced market tomatoes had small tonnage. For every grower who produced more than 5 tons there were 4 who produced less.

For the growers who produced over 5 tons of tomatoes, nine sold to canning factories for one that did not.

TOMATO YIELDS

Year	Number of farms having following yields per acre						Total number farms
	Less 3 tons	3.0 to 5.9	6.0 to 8.9	9.0 to 11.9	12.0 to 14.9	15 and more	
<u>Newfane-Olcott area</u>							
1913	0	6	11	7	2	0	26
1914	4	3	14	6	4	0	31
1915	5	5	3	1	0	0	14
1916	14	5	2	0	0	0	21
1917	45	1	1	1	2	1	51
1918	29	40	20	3	1	0	93
1919	9	17	26	21	2	2	77
1920	9	23	28	22	14	2	98
1921	8	9	14	9	5	6	51
1922	15	19	26	15	1	7	83
1923	33	28	22	7	4	3	97
1924	22	29	36	10	5	3	105
1925	20	32	28	8	2	4	94
1926	25	25	12	10	7	2	81
1927	12	33	19	9	6	1	80
1928	34	20	13	6	3	0	76
1929	9	18	23	10	4	2	66
1930	17	28	8	0	0	0	53
1931	10	13	17	11	4	3	58
1932	5	10	4	3	0	1	23
Total	325	364	327	159	66	37	1278
<u>Hilton area</u>							
1928	2	0	3	-	-	1	6
1929	2	1	2	1	4	2	12
1930	4	10	11	4	-	-	29
1931	2	4	6	4	3	3	22
Total	10	15	22	9	7	6	69
<u>Morton area</u>							
1928	-	-	3	-	-	-	3
1929	1	3	5	5	1	2	17
1930	2	6	8	4	2	1	23
1931	-	2	-	2	2	4	10
Total	3	11	16	11	5	7	53
<u>Per cent of farms</u>							
Newfane	25	29	26	12	5	3	100
Hilton	14	22	32	13	10	9	100
Morton	6	21	30	21	9	13	100

TOMATO ACREAGE

Percentage of tomato growers with following tomato acreage

Year	Less than 1 A.	1.0 to 1.9	2.0 to 2.9	3.0 to 3.9	4.0 to 4.9	5 and more	Total
<u>Newfane-Olcott area</u>							
1913	-	15	46	23	8	8	100
1914	7	26	29	19	13	6	100
1915	7	14	43	22	7	7	100
1916	29	14	33	19	5	0	100
1917	25	16	31	16	8	4	100
1918	16	27	29	13	9	6	100
1919	25	27	27	9	7	5	100
1920	10	38	30	13	4	5	100
1921	49	27	12	10	2	0	100
1922	14	22	28	17	6	13	100
1923	14	24	33	12	10	7	100
1924	14	20	31	21	6	8	100
1925	14	22	27	17	10	10	100
1926	16	19	27	24	4	10	100
1927	13	25	24	22	10	6	100
1928	18	16	31	21	11	3	100
1929	27	23	19	9	11	11	100
1930	27	17	26	8	14	8	100
1931	25	20	25	18	6	6	100
1932	53	14	15	6	2	10	100
Average	20	22	27	16	8	7	100
<u>Hilton area</u>							
1928-31	11	6	16	24	16	27	100
<u>Morton area</u>							
1928-31	5	22	29	11	8	25	100

During the 20-year period from 1913-1932, one-fifth of the farmers growing tomatoes in the Newfane-Olcott area had less than one acre of tomatoes and two-thirds had less than 3 acres.

From 1928-1931, about one-quarter of the farmers growing tomatoes in the Hilton and Morton areas had 5 acres of tomatoes or more.