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Working Paper

Evolution and Change in New York Agriculture

Staff Paper, No. SP 85-01

Provided in Cooperation with:

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Suggested Citation: Stanton, B.F. (1985) : Evolution and Change in New York Agriculture, Staff Paper, No. SP 85-01, Cornell University, Charles H. Dyson School of Applied Economics and Management, Ithaca, NY,
<https://doi.org/10.22004/ag.econ.184840>

This Version is available at:

<https://hdl.handle.net/10419/276660>

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CORNELL
AGRICULTURAL ECONOMICS
STAFF PAPER

EVOLUTION AND CHANGE IN NEW YORK AGRICULTURE

by

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January 1985

No. 85-1

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EVOLUTION AND CHANGE IN NEW YORK AGRICULTURE

This space on the program was intended, I think, to encourage us to spend some time trying to gain perspective on where agriculture is today. Change has come so rapidly and repeatedly to New York's farms and farmers that perspective is not easy to obtain. It is particularly important when looking to the future to try to understand the process of progress.

Some Agricultural History

Think with me briefly about 100 year intervals in our agricultural history starting with 1585, followed by 1685, 1785, 1885 and the present. Some 400 years ago (1585) New York was the land of the Iroquois and the Algonquins. There was some agriculture; corn, beans, and pumpkins were the principal crops. Most of the land was in forest. Perhaps as many as 50,000 Indians¹ lived in villages across the hills and valleys of what would some day be called New York.

By 1685 the Europeans had come and settled parts of Long Island and the Hudson Valley. A population census in 1698 counted 18,067² inhabitants of which 68% were located in the five counties we now think of as New York City. The Dutch and English brought with them domestic livestock, vegetables and cereal grains. But the land yielded little surplus for the

¹Thompson, John H., Geography of New York State, Syracuse University Press, 1966, pp. 115.

²Ibid, Thompson, pp. 130.

port city traders. Colonization of the Hudson Valley was resisted by the Indian natives. Counting the Indians, perhaps as many as 100,000 people lived in this state.

Two hundred years ago in 1785, the American Revolution had just ended. The Hudson Valley and the Mohawk Valley west to German Flats were now settled and controlled by Northern Europeans. General Sullivan's march had decimated Indian settlements and their resistance in Central and Western New York. It had also opened the eyes of his soldiers to the fertility of the land and its potential for agriculture. Perhaps as many as 300,000 people including the Indians lived within the state's borders.³

Farming was a constant struggle for survival. Hedrick provides this description:

"The hoe was a commoner tool than the plow, the hoe-blade was made by the smithy, heavy, ill-formed, and clumsy, the handle a stick cut from the forest with the bark left on. The cradle was not in use until after the Revolution and grain was cut with a sickle; grass with a scythe. At least 80 percent of the inhabitants of New York before the Revolution were farmers, in the sense of living on a farm, but farmers who

³Ibid, Thompson, pp 143.

were turning their hands to making or doing something in a dozen trades....In culture, harvesting, and threshing of grains, the colonists were not much advanced beyond Biblical times."⁴

Self-sufficiency was the order of the day. Hunting and fishing added to the food supply. Clothing was fashioned from home-spun wool, flax and hides. There was little surplus for trade; barter was more important than money.

One hundred years later, in 1885 the industrial revolution had touched everyone. New York was rapidly settled. By 1820 New York's wilderness had been conquered by the axe. In James Fenimore Cooper's words, "The American axe! It has made more real and lasting conquests than the sword of any warlike people that ever lived." Hedrick waxed more eloquently:

"No other implement used by pioneers in forest regions can compare in usefulness to the keen-edged, shining trenchant American axe, skillfully hung on its helve of American hickory, and efficiently swung by the corneous handed American sons of toil in carving farms from the American wilderness."⁵

⁴Hedrick, U.P., A History of Agriculture in the State of New York, Albany, New York State Agricultural Society, 1933 pp. 64-67.

⁵Ibid, Hedrick pp. 111.

New York State had nearly 1.4 million people in 1820; New York City was the nation's leading city and center of trade; more than 85 percent of the state's people were rural or lived in villages of 3000 people or less.

By the time of the first agricultural census in 1840 New York was the nation's leading agricultural state and dairying was its chief industry. Wheat grown in the Genesee Valley was the envy of the rest of the country. First the Erie Canal and then the railroads made New York the gateway to the West. Commerce and industry flourished along with agriculture.

But it was not easy. To many farmers there were more downs than ups. The first lush crops on virgin soils in a few years were often followed by trouble.

"Constant cropping had reduced the yield (of wheat) and winter killing was proving very destructive in the upland regions. During the Revolution, the Hessian fly ravaged the wheatfields of Long Island and gradually spread up the lower Hudson Valley. Smut, rust and mildew, not to mention grasshoppers and Canadian thistle, blighted and destroyed many fields."⁶

The heyday of the Genesee Valley as one of the nation's grain centers ended in the 1850's when the midge finally became

⁶Ellis, Frost, Sysett, and Carman, A Short History of New York State, Cornell University Press, 1957, pp. 168.

an intolerable problem. There was a Merino sheep boom and bust between 1805 and 1815. Then flocks were rebuilt with English breeds to a high point in 1845, but competition from the West steadily reduced numbers from the 1850's onward. Farming was both a way of life and a business in which the "ups" and "downs" were part of the expected patterns of life.

By 1885, three-fourths of the land area of New York was encompassed by some 225,000 farms. Both the number of farms and the land in farms held remarkably stable from 1870 to 1910. Mechanization, the opening of the West and improved transportation had brought increased competition to farmers for Eastern markets. New York's population of 5.5 million was now classified as 40 percent rural. In this setting, President White of the New York State Agricultural Society included this statement as part of his address just 100 years ago.

"Next to the exhausting effects of famine, penury and want, in the business world comes the demoralizing influence of too great prosperity, producing more than the community can consume or use. The surplus is an incubus on all effort and enterprise; stagnation and starvation join hands in a weary waiting for a healthy demand of the powers of production. What is wanted is a market where we can dispose of what we can

raise and what we can produce and manufacture, so that labor may be employed and occupation provided; give us the markets and America is equal to feeding and clothing the civilized world."⁷

Surpluses and markets were problems then as now. When supply exceeded effective demand, prices fell drastically. The last 30 years of the nineteenth century were beset by chronic low prices and agricultural depression. New York's farmers were caught in the same economic environment as the rest of the country.

Table 1. CHANGES IN NEW YORK AGRICULTURE
Agricultural Census Data, 1900, 1950, 1982

Description	Census statistics		
	1900	1950	1982
Number of census farms	226,720	124,780	42,200**
Number of milk cows	1,502,000	1,218,000	875,100
Milk production mil. lb.	6,646	7,481	11,147
Land in farms, acres	22,648,000	16,017,000	9,189,000**
Total cropland, acres	15,600,000*	8,485,000	5,697,000
All hay harvested, acres	4,965,000	3,196,000	2,463,000
Corn for silage, acres	190,000	459,000	655,000
Corn for grain, acres	659,000	163,000	594,000
Oats for grain, acres	1,330,000	564,000	273,000

Source: U.S. Census of Agriculture.

*Improved land including pasture (1900 only).

**The best estimates by the USDA of farm numbers and land in farms using all sources of data in 1982 are 48,000 farms and 9.5 million acres.

⁷White W. M., "Presidential Address, 1885," Transactions of the New York State Agricultural Society, Vol. 34: 1883-1886 pp. 373.

In the one hundred years since 1885 rates of change have increased, if anything. Land in farms has shrunk to less than half of that in the peak years (Table 1). Farm numbers are one-fourth of what they were. There is less land in crops, fewer cows and fewer farmers. But output has continued to increase through the miracles of new technology and attendant increases in productivity.

Some sense of the scope of this change is provided in Table 2. In 1900, power on farms came mostly from horses, teams of oxen and human beings. Fields were small. Most full-time farms had less than 180 acres. By 1950 tractor power and electric motors had replaced most of the animal power on farms as well as reducing at least a part of the human drudgery of farming. Small farms were being combined into larger units; many of the smaller units (less than 100 acres) were part-time or residential farms. In the next 30 years, primarily between 1950 and 1970, the pace of exodus quickened. Farms with 180 acres or more in 1982 accounted for more than 80 percent of the land in farms.

Table 2. DISTRIBUTIONS OF FARMS BY ACRES
 PER FARM AND TOTAL ACRES
 New York Census Data 1900, 1950, 1982

Acres per farm	<u>Percent of total number</u>			<u>Percent of total acres</u>
	1900	1950	1982	1982
	<u>percent</u>			
1 - 49	29.8	27.0	22.1	2.1
50 - 99	28.1	21.4	15.5	5.2
100 - 179	28.2	27.7	19.2	11.9
180 - 259	9.4	13.0	14.0	13.9
260 - 499	3.9	9.1	19.7	32.0
500 - 999	0.5	1.6	7.8	23.2
1000 and over	<u>0.1</u>	<u>0.2</u>	<u>1.7</u>	<u>11.7</u>
Total	100.0	100.0	100.0	100.0
Number of farms	226,720	124,780	42,207	42,207

The current structure of farming in New York is shown in Table 3. Size of business is measured on the basis of sales volume, a general industry practice. Three different classes of farms are designated. One group has been called residential farms, those with agricultural sales of less than \$5,000. They account for more than 35 percent of the farms counted by the census but only 1 percent of total value of sales. A second group has been designated as part-time farms, those with sales between \$5,000 and \$40,000. These farms encompass a wide range of situations -- some who are trying to get into farming, others who are retired. In nearly all cases, off-farm sources of income are more important to these families than net returns

from farming. They make up 27.5 percent of the total number and nearly 8 percent of total sales.

Table 3. NUMBER OF FARMS AND VALUE OF PRODUCTS SOLD
New York Census, 1982

Value of agricultural sales	Number of farms	Percent of total	Total value of sales	Percent of total
<u>millions</u>				
<u>Residential farms:</u>				
Less than \$5,000	14,900	35.3	\$ 25.2	1.0
<u>Part-time farms:</u>				
5,000 - 9,999	4,339	10.3	30.7	1.3
10,000 - 19,999	3,563	8.4	50.3	2.1
20,000 - 39,999	3,696	8.8	107.8	4.5
<u>Commercial farms:</u>				
40,000 - 99,999	8,313	19.7	563.3	23.2
100,000 - 199,999	4,991	11.8	682.6	28.1
200,000 - 499,999	1,975	4.7	567.9	23.4
\$500,000 and over	398	0.9	391.7	16.1
Abnormal farms*	32	0.1	7.4	0.3
Total	42,207**	100.0	\$2,426.9	100.0

*Abnormal farms are institutional, experimental and cooperative operations.

**USDA estimates another 6000 farms with sales of less than \$10,000 which were not counted by the Census.

Most commercial farms in New York have annual sales of at least \$40,000 or more. In the 1982 census there were a little less than 16,000 such businesses accounting for more than 90 percent of agricultural output. There are nearly 400 farms now with sales of \$500,000 or more annually that produce one-sixth

of our output. Most of these are family businesses organized as partnerships or family corporations.

The structure of farming in New York has many similarities to that in the rest of the United States but there are some important differences as well (Table 4). Farms with sales of less than \$5,000 make up about equal proportions of both the total number of units and total sales. Relatively large numbers of people are now able to live in the country, earn essentially all their family living away from the farm, but still grow a few crops or keep some livestock.

Part-time farming (\$5,000 to \$40,000 of sales) is more important in other parts of the country than in New York. It makes up 37 percent of farm numbers compared to 27.5 percent in New York and proportionately more of total sales. Many of these part-time farms nationally are in the South where small acreages of tobacco and other crops are combined effectively with off-farm jobs.

There are important differences in the commercial sector as well. A higher proportion of all the units counted as farms sell \$40,000 or more of farm products in New York compared to the rest of the country (37 percent vs. 29 percent). More of them in terms of numbers and proportion of sales in New York can be characterized as traditional family farms. Perhaps the biggest contrast is the importance of the farms with \$500,000 of sales or more. In the United States they now account for 30 percent of total output while only 16 percent in New York.

Large corporate farms are not yet an important part of New York's farm economy.

Table 4. PERCENT OF FARMS BY SIZE AND TOTAL SALES
New York and United States, 1982

Value of agricultural sales	<u>Number of farms</u>		<u>Total value of sales</u>		
	New York	U.S.	New York	U.S.	
<u>Residential:</u>		<u>percent of total</u>			
Less than \$5,000	35.3	34.4	1.0	1.4	
<u>Part-time:</u>					
5,000 - 9,999	10.3	13.8	1.3	1.8	
10,000 - 19,999	8.4	11.7	2.1	3.1	
20,000 - 39,999	8.8	11.4	4.5	6.1	
<u>Commercial:</u>					
40,000 - 99,999	19.7	16.4	23.2	19.2	
100,000 - 199,999	11.8	7.7	28.1	19.3	
200,000 - 499,999	4.7	3.6	23.4	19.0	
\$500,000 and over	1.0*	1.0	16.4*	30.1	

*Abnormal farms included.

Forces Influencing the Future

This brief overview of the development of New York's agriculture at 100 year intervals since 1585 omits much of the drama of the intervening years. Yet it does provide some perspective as we think about the future.

My forecast is that one hundred years from now we will have fewer commercial farms than today, perhaps as few as 5,000. Instead of one-third of the state's total land area in farms it may shrink

to one-quarter. But forage crops fed to livestock will continue to be the primary basis for much of our commercial farming. Fruits and vegetables will still be important on specialized farms. More land will have returned to forest but nothing like the change that occurred in the last 100 years.

Energy - Consider for a few minutes the changes in the sources of power for farming. In 1685 Europeans and Indians alike lived in villages and practiced a primitive agriculture powered almost entirely by human energy. Even in 1785 as the surge westward into central and western New York began, animal power provided only a small fraction of the energy required to fell trees and then to plant and harvest crops. It was not until the 19th century that oxen and horses did a high proportion of the heavy field work. Human effort was still a major ingredient in most operations. In 1985 tractor power has essentially replaced animal power and electrical motors are a key component of many agricultural systems.

In 2085, sources of power are likely to continue to be a major determinant of the way farms are organized and operated. For example, looking at my solar powered calculator makes me wonder if farming, the industry so dependent on solar power for photosynthesis and crop farming, may well be the place where some new solar collecting technology is applied. Regardless of its source, the energy requirements of modern agriculture will continue to constrain and influence the shape of farming in the years ahead.

Capital - Another evolutionary force has been the amount of capital used per worker in farming. When simple tools like the hoe and sickle were so important, the amount of capital used per worker was indeed small. Successively, as the new technology of each period was adopted by farmers, capital was used to replace labor. Particularly in the last 50 years, the price of capital relative to labor has fallen and labor productivity increased. In the last 5 years, the real price of capital has increased relative to labor. Is this change a small blip in the long term trend or are there now so many competing demands on the supplies of capital that in the future capital to labor ratios in farming may become more stable? In other words, are we beginning to reach some upper limit on the number of acres of crops per worker that are handled most efficiently, or will the long term trends continue? Experience in the last 5 years suggests this to be a fair question. Even if this is not so, should we not expect that the rate of increase in capital requirements per worker in farming will begin to slow perceptibly?

Interdependency - Anyone thinking about developments in farming from Colonial times to the present is struck by the change from self-sufficiency of 200 or 300 years ago, to the interdependent specialized business world of farming today. Farmers are dependent on many different suppliers for their basic necessities of production: -- seed, gasoline, herbicides, electricity, even semen to breed their cows. They are specialists living in a world of specialists. Most go to the grocery store to buy their daily food supply. Consumer tastes and preferences finally determine which

products are sold, where market demand expands and where it contracts. New York farmers must compete for markets with those in the rest of this country and throughout the world. Competition has changed the face of New York agriculture consistently over the past 150 years and can be expected to be equally powerful in the decades ahead.

As one of the many people who grew up on a farm, but who now lives and works outside production agriculture, I wonder what the costs to society may be as more and more of the nation becomes urban and suburban reared. Is this a somewhat nostalgic view of a farm reared professor, comfortably settled in suburbia? Or is this another important perspective to recognize in looking at the evolution of New York agriculture? Once the nation's most important farm state from 1830 to 1860, New York today is the ready example of an industrialized, urban place to live. Commercial farming employs less than one percent of the state's labor force. To be born and grow up in the countryside, much less on a farm, is now a rarity. Is it possible to teach the lessons of seed time and harvest and the dependence of human life on nature without personal experience? Can we share in some way the sense of wonder and humility that comes from harvesting a bumper crop or from accepting a crop failure?

The pragmatic part of me says that raising questions like these has no place in this presentation. But the questions do not go away. One special role of an organization like the New York State Agricultural Society is to provide leadership in emphasizing how much all of the people of the state are dependent on each other.

It can help the general public understand how the different parts of the food system contribute to providing us with the necessities of life. We can no longer be self-sufficient regardless of where we live. We need to understand the problems of the people from whom we buy our inputs. We need to get the perspective of those businessmen to whom we sell our products. There is a continuing need to pass on, not only the story of commercial farming and its place in a specialized commercial business world, but the rural values that go with it. The New York State Agricultural Society had its start by filling a special educational need to farmers before the days of Cooperative Extension. Perhaps the new challenge is also in education, now to explain how the larger food system works -- both for the benefit of its own members and the rest of society as well.

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January 1985

This paper was presented at the 153rd Annual Meeting of the New York State Agricultural Society on January 3, 1985.

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