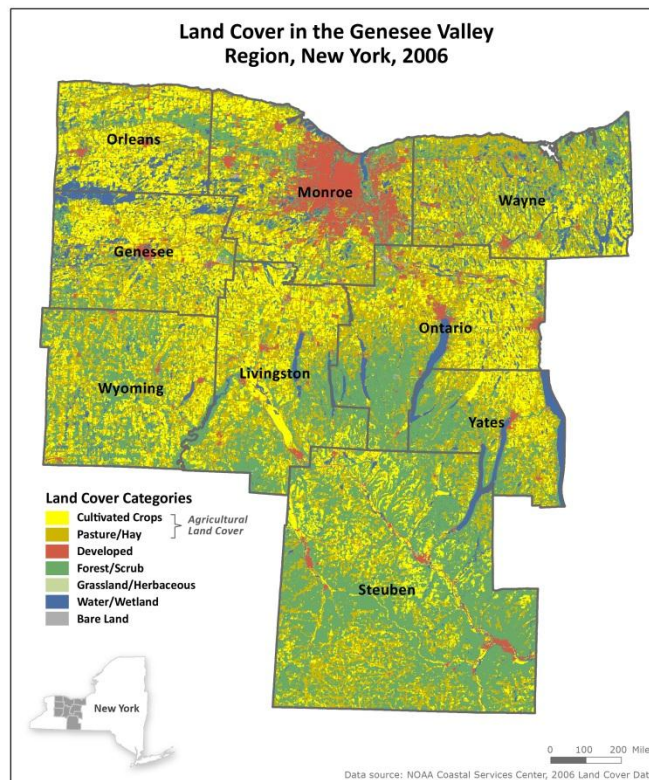


# Quantitative and Qualitative Measures of Fruit and Vegetable Production in the Genesee Valley



Kristen S. Park

Charles H. Dyson School of Applied Economics and Management  
College of Agriculture and Life Sciences  
Cornell University  
Ithaca, New York 14853-7801

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## Introduction

Agriculture is a vibrant part of New York state's economy and is especially so in the Genesee Valley region in Western New York. This study covers a nine-county region called the Genesee Valley region comprised of Genesee, Livingston, Monroe, Ontario, Orleans, Steuben, Wayne, Wyoming, and Yates counties. Several economic factors are having an impact on agriculture in the region. Two large yogurt processing plants are opening in the region. In addition, Bonduelle, a large, international vegetable processor, has purchased two existing vegetable processing plants and one vegetable packaging plant from Allen's, Inc., while Champlain Valley Specialty, a fresh-cut apple processor from eastern New York, has expanded its operations to include an additional fresh-cut plant in Oswego County, not far from the largest apple-growing county in the state, Wayne County.

These separate infusions of agribusiness capital have created excitement in the production community and also some uncertainty. The new business partners have the potential to reshape production decisions. Will milk needed for yogurt production expand dairy needs and force out land formerly used for vegetable production? Will the new vegetable processor be successful in this, their first U. S. venture, and provide stable demand and contracts for processed vegetable growers?

In addition, an explosion in the number of new farmers' markets, has created a demand for farmer vendors, but sometimes finding farmers able and willing to staff these new farmers' markets has not been easy. Cost accounting data from fruit and vegetable direct marketers using various direct marketing channels suggest that farmers' markets may be less profitable than other direct marketing channels such as Community Supported Agriculture (CSAs), farm stores, and farm stands (LeRoux, M. N., et al., 2009).

This report will present information about production capacity and production flows in and out of the region. It will provide useful information for discussions with agricultural economic development in the region. Data were obtained from a producer survey as well as industry member interviews, U. S. Census, U. S. Department of Agriculture, and additional secondary resources.

## National Fruit and Vegetable Trends

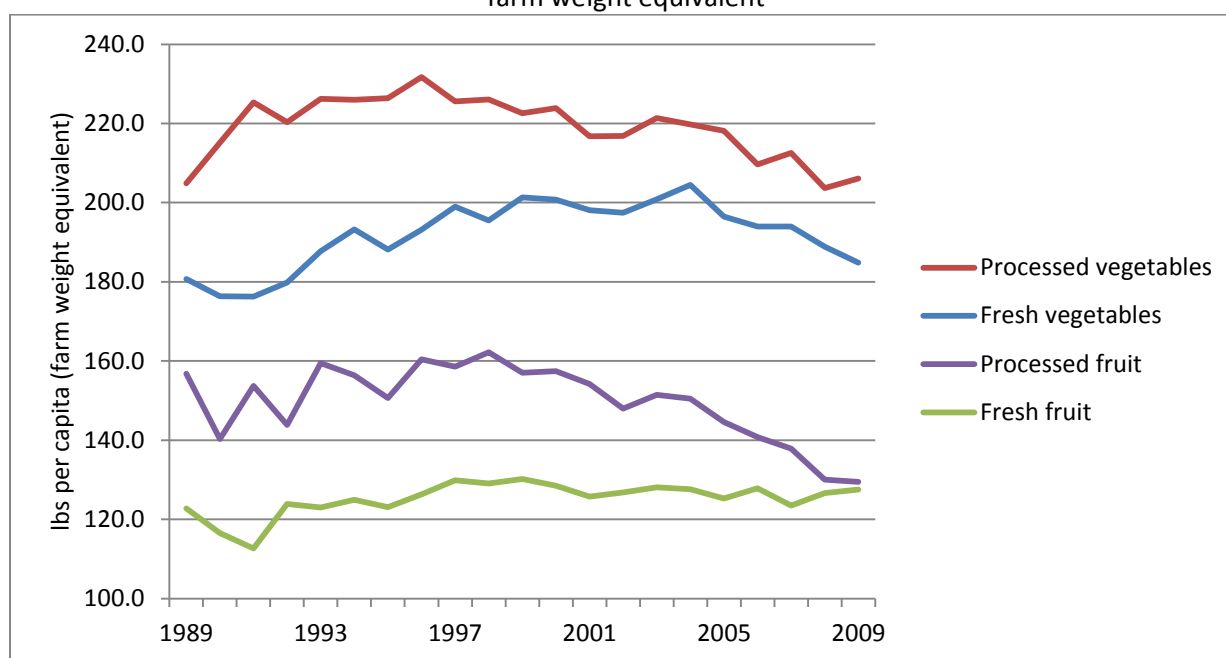
For more than ten years total U.S. fruit and vegetable consumption, fresh and processed, has declined. Most of the decline has occurred in the consumption of processed products, particularly fruit juices and canned and frozen vegetables (Figure 1). This has occurred despite recommendations from various nutritionists, medical professionals, health care professionals, and federal and state agencies to increase overall consumption of fruits and vegetables. The decline in consumption is leading to market challenges for growers, processors, and retailers of fruits and vegetables.

Almost all of the decline in per capita fruit consumption can be attributed to a decline in juice consumption since the late 1990s, and more specifically a decline in orange juice consumption. Orange juice consumption, measure as fresh weight equivalent at the farm level, dropped almost 30 pounds since the late 1990s. Apple juice, on the other hand, has increased since the late 1990s. Slight declines in per capita consumption of canned and dried fruits since 1989 have been observed.

Trends in vegetable consumption per capita have taken a number of twists and turns during the last two decades. Since the mid-1990s, processed vegetable consumption declined. In particular, canned vegetable per capita utilization dropped roughly 10% by 2009 from record highs in the early 1990s. However, it is now at levels roughly equal to consumption during the 1970s-1980s. The changes in canned vegetable use were largely driven by shifts in canned tomato purchases that represent about 70% of canned vegetable consumption. Frozen vegetable consumption jumped roughly 15% from 1989 to 1999 and dropped slightly since then through 2009. Frozen potatoes represent roughly 70% of frozen consumption.

Declining per capita consumption is predominant in the United States; and the trend impacts every business in the supply chain. As a consequence, New York fruit and vegetable industries must also cope with the impact of this decline in consumption. Industry members are pressured to manage production costs while attempting to keep pace with innovations in technology and new product development even as per capita consumption declines.

Figure 1. Estimates of Per Capita Fruit and Vegetable Consumption  
--farm weight equivalent--



Source: USDA – Economic Research Service. Food Availability Data System.  
<http://www.ers.usda.gov/Data/FoodConsumption/FoodAvailIndex.htm>

The impact on the processing sector has also been observed. According to the U. S. Economic Census, although the value of U.S. fruit and vegetable manufacturing shipments increased 13.1% from 2002 to 2007, the value of fruit and vegetable manufacturing shipments in New York actually declined by 1.0% (Table 1). In New York, however, the loss of processing establishments was not as severe as the loss of establishments nationally.



In 2007, New York State had 86 fruit and vegetable processors with sales of approximately \$2.8 billion. A number of national brands such as Mott's, Silver Floss, and Libby's are processed in the Genesee Valley region, while the region also has some frozen fruit and vegetable repackers as well as niche processors.

Table 1. Change in Fruit and Vegetable Processing Establishments and Value of Shipments, 2002 to 2007  
--Percent Change--

Industry	No. of establishments	Value of shipments
U.S. Fruit and Vegetable Manufacturing	-7.8%	13.1%
New York State Fruit and Vegetable Manufacturing	-2.8%	-1.0%

Source: U. S. Census Bureau – Economic Census, 2002 and 2007

Despite the flat to declining per capita consumption of fruits and vegetables, fresh produce sales in the retail sector have been growing (Table 2). Consumer interest in health and convenience have been well met by supermarket produce department offerings of packaged salads, fresh-cut vegetables, and organics. Retail sales have increased due primarily to inflation and sales of higher margin, value-added products. Actual increases in volume have not been enough to keep up with population growth.

Table 2. Estimates of All U. S. Retail Sales of Fresh Fruits and Vegetables<sup>1</sup>

	2002	2007	% change
	\$ billions		%
Retail Produce Sales	49.6	63.5	28.1%

<sup>1</sup> includes sales from all retail outlets

Sources: U. S. Census Bureau – Economic Census and Cornell calculations

Retail sales of canned and frozen vegetables grew in 2008 and 2009 during the depression but sales estimates for 2010 indicate minimal growth (Table 3). Canned fruits showed mostly flat or negative growth from 2007 to 2010 and frozen juices slipped drastically 2008 to 2010. Even shelf-stable juices showed little or negative growth from 2008 to 2010.

Table 3. Changes in Retail Sales of Processed Fruits and Vegetables

	% change vs year ago		
	2008	2009	2010
Frozen vegetables	6.0	3.4	0.1
Canned vegetables	5.8	8.0	1.6
Canned fruit	0.0	0.7	-3.6
Frozen juices, drinks	-3.3	-7.0	-11.6
Shelf-stable juice, drinks	-0.4	-2.4	0.2

Source: Chanil and Major, 2011a

## The Genesee Valley Study Region

*The study area is a region of nine counties in western central New York comprised of Genesee, Livingston, Monroe, Ontario, Orleans, Steuben, Wayne, Wyoming, and Yates counties.*

### Demographics

- 1,280,895 people in 2010 up 1.26% from 2000 (*slower population growth than the NYS growth of 2.1%*)
- Metropolitan or Micropolitan Statistical Areas include: Rochester (metropolitan area) and Batavia and Corning (micropolitan areas).

Source: U.S. Census Bureau, 2007 State and County QuickFacts, <http://quickfacts.census.gov/qfd/states/36/36123.html> and County Summary Highlights: 2007 and 2000

### Agricultural Demographics

Genesee Valley study region:	As a percent of New York state:
• 5,742.52 square miles of total land area	12.2% of New York state land area
• 7,482 farms	20.6% of New York farms
• \$1,281 million market value of agricultural products sold	29.0% of New York ag product sales
• \$990 million Total farm production expenses	28.3% of New York farm production expenses
<hr/>	
Changes in the regional agricultural statistics between 1997 and 2007:	
• 19.5% increase in number of farms	
• 110.9% increase in market value of agricultural products sold	
• 111.5% increase in total farm production expenses	

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Sources: U.S. Census Bureau, 2007 State and County QuickFacts, <http://quickfacts.census.gov/qfd/states/36/36123.html> and U.S. Department of Agriculture – National Agricultural Statistics Service. Censuses of Agriculture, State and County Summaries, <http://www.agcensus.usda.gov/Publications>

## Land Cover

The region covers over 5,742 square miles (Table 4 and Figure 2). The study uses a land cover dataset from the National Oceanic and Atmospheric Administration that describes all the land cover in a geographic area. The region is largely agricultural with a large percentage of land cover in agriculture. In 2006, the most recent year for which data are available, agricultural land, defined as pasture, hay, and cultivated crops, covered 49% of the total area of the region. The region is much more developed agriculturally than New York in general. In New York, 22.8% of the land cover is in agriculture. The greatest land cover in the state is forest and woodland systems that comprise 53.7% of the land cover.

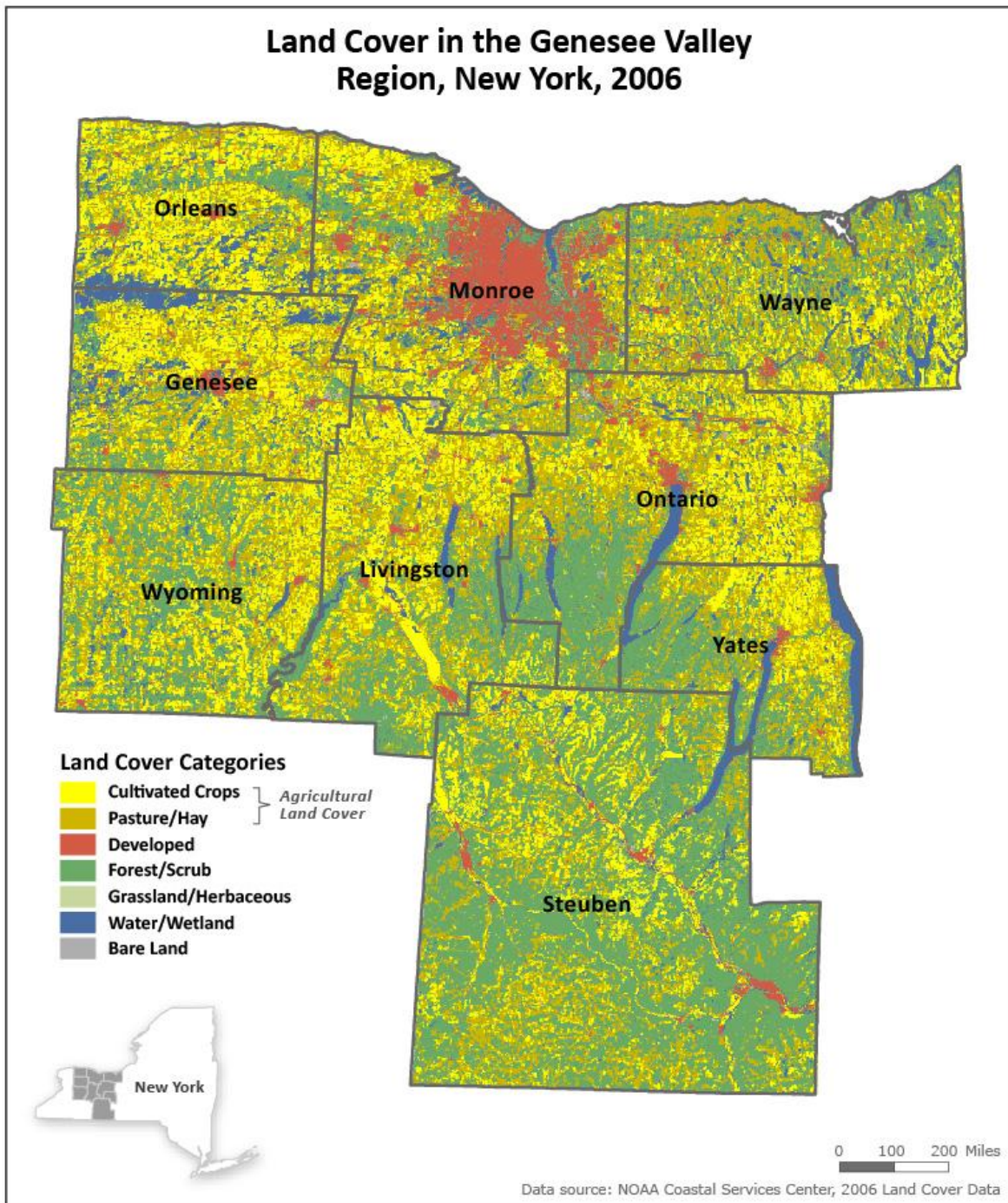
Table 4. 2006 Agriculture Land Cover in the Genesee Valley Region

County	Total area	2006 Ag land cover	% of total land area
	<i>sq miles</i>	<i>sq miles</i>	<i>%</i>
Genesee	492.94	304.62	61.8
Livingston	631.76	360.91	57.1
Monroe	657.21	276.19	42.0
Ontario	644.07	354.21	55.0
Orleans	391.26	244.58	62.5
Steuben	1,390.56	478.84	34.4
Wayne	603.83	314.31	52.1
Wyoming	592.75	323.11	54.5
Yates	338.14	171.92	50.8
Genesee Valley region	5742.52	2,828.69	49.3

Source: National Oceanic and Atmospheric Administration, C-CAP Land Cover Atlas.  
<http://www.csc.noaa.gov/ccapatlas/#app=53cc&b8de-selectedIndex=2>

Figure 2 illustrates the land cover in the region and contrasts areas of development with non-developed lands which includes agricultural, forests, grasses, water, and barren lands.

Figure 2. Land Cover in the Genesee Valley Region, New York, 2006



The region's agricultural land cover remained extremely stable from 1996 – 2006. Although some land changed and moved from other land into agricultural production and some moved from agricultural cover into other land cover, the net change in land area averaged less than one percent (0.07%) from 1996 to 2006 (Table 5 and Figure 3).

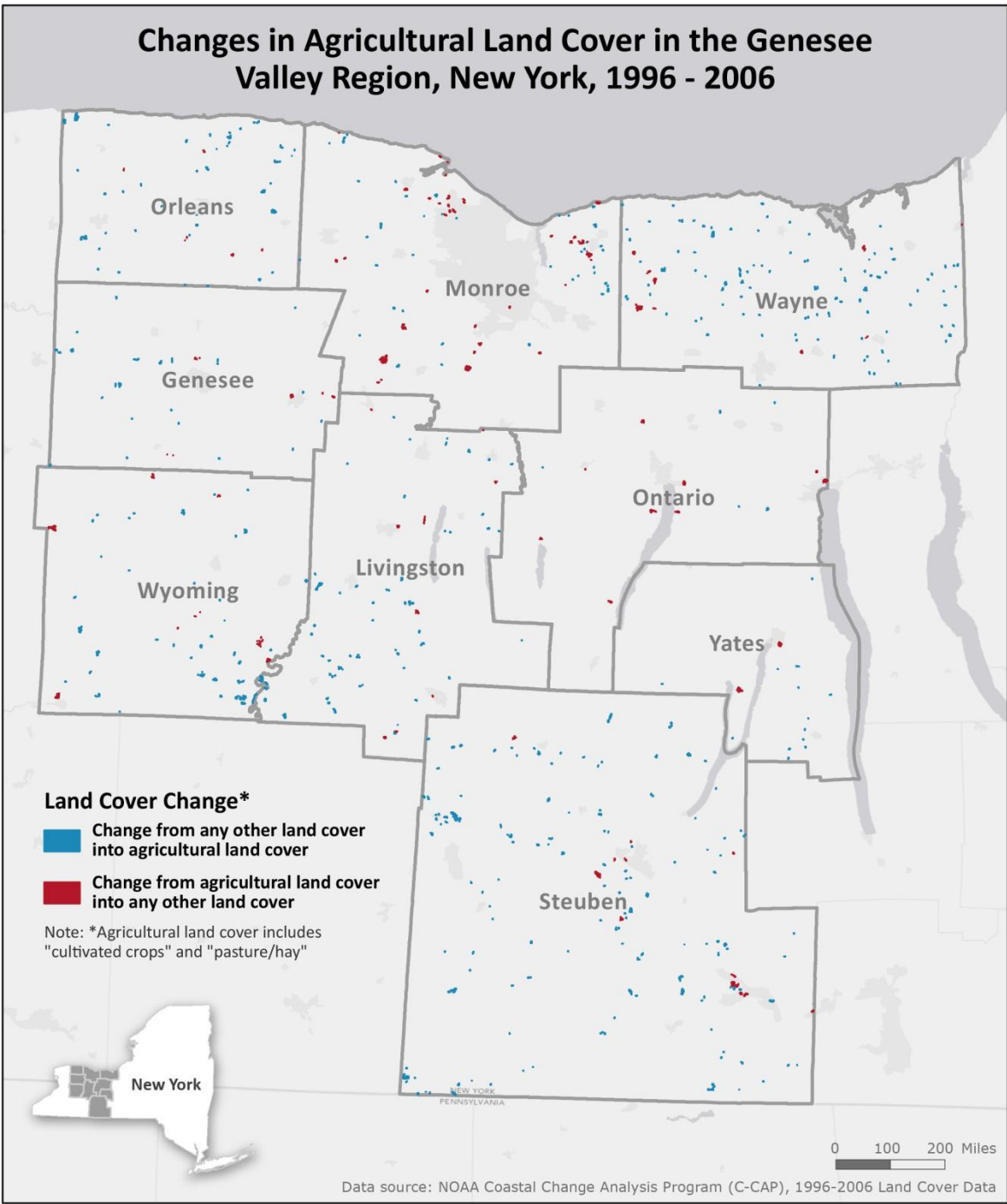
Table 5. Changes in Agriculture Land Cover in the Genesee Valley Region, 1996 – 2006

County	1996	2006	Net gain/loss	% change
	<i>sq mi</i>	<i>sq mi</i>	<i>sq mi</i>	%
Genesee	304.64	304.62	-0.02	-0.01%
Livingston	360.45	360.91	0.46	0.13%
Monroe	276.48	276.19	-0.30	-0.11%
Ontario	354.36	354.21	-0.16	-0.04%
Orleans	244.16	244.58	0.42	0.17%
Steuben	477.87	478.84	0.96	0.20%
Wayne	313.80	314.31	0.51	0.16%
Wyoming	322.90	323.11	0.21	0.06%
Yates	171.93	171.92	-0.01	-0.01%
GVR	2,826.59	2,828.69	2.10	0.07

Source: National Oceanic and Atmospheric Administration, C-CAP Land Cover Atlas.

<http://www.csc.noaa.gov/ccapatlas/#app=53cc&b8de-selectedIndex=2>

Figure 3. Changes in Agricultural Land Cover in the Genesee Valley Region, New York, 1996 – 2006





## Fruit and Vegetable Production Capacity

The region is an exporter of many agricultural products including a number of fruit and vegetable crops. Regional production was estimated by obtaining fruit and vegetable crop acreage from the 2007 Agricultural Census and multiplying it by average crop yields for the region obtained from researchers at the New York State Agricultural Experiment Station. By these estimates, the Genesee Valley region produced approximately 75.5% of New York's vegetable crop and 49.9% of its fruit crop (Table 6)

Table 6. Estimated Production of Fruits and Vegetables in the Genesee Valley Region<sup>1</sup>

	New York production	Regional production <sup>2</sup>	% of New York Production
	<i>million lbs</i>		<i>%</i>
Fruits, incl. berries	1,715.5	855.4	49.9
Vegetables and melons	2,164.7	1,633.2	75.5
Total fruits and vegetables	3,880.2	2,488.6	64.1

<sup>1</sup> farm weight equivalent of fresh and processed products

<sup>2</sup> estimated using data from U.S. Department of Agriculture, National Agricultural Statistics Service, 2007  
*Agricultural Census*

Regional consumption was calculated by obtaining estimates of average per capita consumption for an extensive list of fruit and vegetable products, including fresh and processed forms. The per capita consumption data are farm weight equivalents before losses due to shrink, storage, transportation, processing, etc. and are from the U. S. Department of Agriculture, Economic Research Service, *Food Availability (Per Capita) Data System*.

If all fruit and vegetable production is combined and then divided by total fruit and vegetable consumption in the region, the region would theoretically produce almost 286% of its needs (Table 7). This includes production for both fresh and processing channels. Because the region does not and cannot produce many items that are consumed, such as bananas and mangoes, it may be more useful to estimate the capacity and consumption of some of the individual fruit and vegetable crops. This will help describe some of the strengths and weaknesses of the region's production in more detail.

Table 7. Estimated Consumption and Production of Total Fruits and Vegetables  
in the Genesee Valley Region<sup>1</sup>

	Regional consumption <sup>2</sup>	Regional production <sup>3</sup>	Production as a % of regional consumption <sup>4</sup>
	<i>million lbs</i>		<i>%</i>
Fruits, incl. berries	330.3	855.4	259.0
Vegetables and melons	540.5	1,633.2	302.2
Total fruits and vegetables	870.8	2,488.6	285.8

<sup>1</sup> farm weight equivalent of fresh and processed products

<sup>2</sup> estimated using data from U.S. Census Bureau, *2010 Census* and U.S. Department of Agriculture, Economic Research Service, *Food Availability (Per Capita) Data System*

<sup>3</sup> estimated using data from U.S. Department of Agriculture, National Agricultural Statistics Service, *2007 Agricultural Census*

<sup>4</sup> calculated

Production of fruits, including berries, is estimated to provide about 259% of fruit consumed. Yet, of the fruit crops, only three are produced in quantities that exceed their regional consumption, apples, grapes, and cherries (tart and sweet combined) (Table 8). Apple production alone provides a sizeable 1,205% of all apples consumed in the region, including both fresh and processed forms of apple consumption. Grape production in the region as a percent of grape consumption is 334%. However, virtually 100% of these grapes are for juice and wine production and what very few are sold for table consumption are usually American varieties, such as the Concord grape. The majority of cherries produced in the region are tart cherries also primarily used for processing. Roughly 10% of the cherry crop is sweet cherries which are primarily consumed fresh.

Peaches and pears are also important fruit crops in the region and production levels are such that they would provide 91.7% and 44.8% of consumption respectively. Peaches and pears from the region go to processed and fresh markets.

Production of raspberries and blueberries is sufficient to provide 50.6% and 34.5% of the region's consumption. Berries are fragile crops, and in New York and the Genesee Valley region, production is primarily on smaller farms and frequently for local, direct markets. The seasons are quite short. It is interesting that the region has production enough for roughly half of its consumption. One possible interpretation is that most blueberry and raspberry consumption occurs when they are in season despite the fact that they are available now year round in most supermarkets.

On the other hand, strawberries are produced in quantities that only cover 13.6% of consumption. The strawberry market is heavily dominated by national labels and these companies have perfected breeding, production, and postharvest handling systems that have allowed for national and international production and distribution 12 months of the year.



Table 8. Estimated Regional Fruit Production as a Percent of Regional Consumption

Fruit	Production as a % of regional consumption
Apples	1,205.1
Grapes	333.9
Cherries	236.4
Peaches	91.7
Raspberries	50.6
Pears	44.8
Blueberries	34.5
Strawberries	13.6
Plums & Prunes	8.8
Blackberries	2.9
-----	
Citrus	0.0
Avocados	0.0
Bananas	0.0
Dates	0.0
Figs	0.0
Kiwi	0.0
Mangoes	0.0
Olives	0.0
Papayas	0.0

NA = Data on currant, nectarine and apricot production at the regional level were not available.

Plums and prunes and blackberries are produced in small amounts locally. Production data at the regional level for the following fruits were unavailable:

- currants, nectarines, and apricots

As shown in Table 8, there are many fruit crops that are not produced in the region. These can be largely discounted in our assessment of the region's productive capacity as they likely cannot be produced economically in the region.

Many vegetable crops are produced in the region in volumes that exceed regional consumption levels (Table 9). Beets, head cabbage, green peas, snap beans, sweet corn, onions, carrots, potatoes, and cucumbers exceed consumption levels estimates. The majority of the beets, green peas, snap beans, sweet corn and carrots are grown for the processed market and are then distributed across the eastern U.S. Head cabbage, onions, and cucumbers are primarily grown and sold for the fresh market, and cabbage and onions are storage crops that can be stored for a number of months postharvest. Potatoes grown in the region are sold to fresh and processed markets; the large majority is sold to the chip market.

Several more vegetables are produced in the region in measureable amounts as shown in Table 9. Production data for some of these crops may be smaller than actual production. The Agricultural Census will not report crop acreage if there is a chance that the data can be associated with an individual farm, and the production of some crops in some counties in the region was withheld. The undisclosed data affect production estimates of the minor crops more than the major crops.

Table 9. Estimated Regional Vegetable Production as a Percent of Regional Consumption

Vegetable	% of regional consumption
Beets	9,651.4
Cabbage	3,334.9
Peas , Green	2,390.0
Beans, Snap	1,612.7
Squash	1,036.6
Pumpkins	927.6
Sweet Corn	708.9
Onions	455.5
Carrots	430.1
Potatoes	251.3
Cucumbers	196.9
Eggplant	40.6
Peppers, Bell	30.8
Cauliflower	30.4
Brussels Sprouts	26.2
Garlic	23.1
Peppers, Chile	13.3
Asparagus	10.0
Cantaloupe	9.4
Kale	8.0
Spinach	7.6
Broccoli	5.2
Tomatoes	5.2
Lettuce, Romaine and Leaf	4.4
Watermelon	1.9
Honeydew	1.2

Production coverage could not be estimated for the following vegetable crops due to lack of production and/or consumption data:

- artichokes, beans (lima), cabbage (Chinese), celery, collard greens, escarole, head lettuce, mushrooms, mustard greens, okra, onions (green), peas - Chinese (sugar & snow), radishes, rhubarb, sweet potatoes, turnip greens, turnips

The region's strengths are the major crops produced in volumes that support regional exports. Exports of these crops from the region to the rest of the state, country or beyond provide income to the growers, packers, shippers, processors, and distributors in the region. As long as these fruits and vegetables are in demand, continued support for regional production of these industries will support the region's economy.

However, the minor crops may also provide economic opportunities. Many of these crops are grown on farms that directly market their produce.. Specializing in these crops provides niche opportunities without risking direct competition with growers of the major crops. More effective market promotion for minor crop fruits and vegetables would help small producers grow their business.

While berries are difficult crops to produce and distribute, consumer demand is very strong and continues to grow. Support of varieties, production, and postharvest handling may benefit the growers in the region.

Despite the overabundance of fruits and vegetables produced in the region, imports of fruits and vegetables are still needed to balance a variety demands. These demands may be consumer-driven or processor-driven. First, consumers demand a variety of foods. Fruits or vegetables that are tasty and nutritious but not grown in the region need to be imported. Oranges are a common example. Consumers eat, on average, 62 pounds of oranges and orange juice per capita, more than any other fruit, yet they are not grown in the Genesee Valley region. Consumers even demand more of different varieties of products, such as Granny Smith apples, organic peaches, or hot house peppers that are usually imported from outside the region.

Second, consumers demand year round availability of fresh fruits and vegetables. Most fresh fruits and vegetables need to be imported during the off-season. A few exceptions are storage crops such as apples, potatoes, onions, and cabbage. Popular, high-volume fruits and vegetables grown in the region seasonally but in demand year round include tomatoes, lettuce, strawberries, melons, etc.

Third, processors import supplies needed to maintain output and to meet customer demands. Fourth, buyers, such as processors, retailers, wholesalers, and distributors import items that are priced competitively perhaps due to abundant supplies in other regions. Finally, buyers import to keep supply chains open from other growing regions as a hedge against local natural disasters, disease outbreaks, etc.

## Fruit and Vegetable Producer Survey

### Method

A producer questionnaire was developed to collect individual farm data on crops, acreage, production volume of leading crops, market channels, and product flow. A team of Cornell Cooperative Extension educators served as advisors and provided input on the questionnaire's design. The questionnaire was beta-tested by the team with selected regional growers. A comprehensive survey mailing database of 1,038 producers was developed by integrating producer lists from cooperative extension and industry groups.

The questionnaire was mailed February 8, 2012 with a second, follow-up mailing March 2, 2012. The survey was placed online and the URL provided on the written hard copy survey. In addition to relying on self-completed responses to the questionnaire from growers, a team of 4 Extension educators interviewed growers using the questionnaire instrument. The purpose was to increase the number of completed and usable questionnaires and to assess how the questionnaire was being interpreted by growers. A total of 227 usable questionnaires were completed and returned, including mailed, online, and interviewed responses. Of these, 205 responses were from fruit and/or vegetable growers and 22 were from producers of only small grains.

A selection of buyers, including shippers, processors, and wholesalers, were interviewed to obtain information about purchases of regionally grown products. These interviews have been instrumental in helping to understand where, how, and why product flows in and out of the region.

### *Survey Responses*

- Median age of the farm                      40 years
  - range    0.25 – 210 years
- Total farm acres                                180,788 acres, owned and rented
- Total fruit acres                                13,902 acres
- Total vegetable acres                        37,932 acres
- Total grain and hops acres                41,903 acres

The survey respondents represent farms that have been operating for less than 1 year to over 200 years, with a median of 40 years. In total, these respondents farmed over 180,000 acres, including 13,902 acres of fruit and 37,932 acres of vegetables. From these responses we have compiled data and conclusions that describe important characteristics of fruit and vegetable production in the region. Questions about small grains for human consumption and hops were also included in the questionnaire but analyses of these are not presented here.

Two hundred five survey respondents produced fruits and/or vegetables. The survey respondents represent 16.7% of the vegetable farms and 16.5% of the fruit farms reported by the 2007 Census of Agriculture, but represent 38.5% of all vegetable acreage and 43.2% of all fruit acreage (Table 10). While most the information obtained from the survey can be used to represent the major fruit and vegetable crop production enterprises in the region, some information may be too limited to accurately illustrate the situation for some of the minor crops.

Table 10. Farms and Production Acreage Represented by Survey Respondents

	2007 Census of Agriculture	Survey Respondents	% of Census
Vegetables			
Farms	795	133	16.7%
Acres harvested	98,611	37,932	38.5%
Fruit			
Farms	769	127	16.5%
Acres harvested	32,240	13,902	43.2%

Note: The number of fruit farm respondents and the number of vegetable farm respondents total to more than the number of survey respondents as some respondents reported having both fruit and vegetable production.

### *Additional Survey Demographics*

Table 11. Additional Farm Activities Conducted by Respondents, N=205

Farm Activity	% of respondents
Field Crops	39.7
Livestock	8.8
Poultry/Eggs	7.4
Dairy	5.4
Other	15.7

In addition to fruit and vegetable production, 56.6% of respondents conducted other farm production activities. While a small number of respondents indicated they also have dairies, livestock or poultry/egg enterprises, a much larger number, 39.7%, reported that they also raise field crops.

Table 12. Number of Respondents by County in Region, N=205

County	No. of respondents	% of respondents
Genesee	28	13.7
Livingston	25	12.2
Monroe	31	15.1
Ontario	17	8.3
Orleans	35	17.1
Steuben	7	3.4
Wayne	66	32.2
Wyoming	8	3.9
Yates	22	10.7

Fruit and vegetable respondents conducted farming in each county in the study region; some conducted farming in multiple counties and a few conducted farm activities in counties outside the region.

Note: numbers do not sum to total number of respondents as some respondents reported farm activities in more than one county

Table 13. Fruit and Vegetable Sales Receipts of Respondents, N=202

Sale Receipts	No. of respondents	% of respondents
Less than \$10,000	22	10.9
\$10,000 - \$24,999	19	9.4
\$25,000 - \$49,999	14	6.9
\$50,000 - \$99,999	26	12.9
\$100,000 - \$249,999	35	17.3
\$250,000 - \$499,999	20	9.9
\$500,000 - \$1,000,000	27	13.4
over \$1,000,000	39	19.6

Sales receipts from farming activities in 2011 in fruit and vegetable production indicate a wide range in the size of operations. 40.1% of respondents reported receipts less than \$100,000, but 19.6% had receipts greater than \$1,000,000.

## Respondents' Production, Markets, and Regional Sales

**Fruit Production.** Apples are the dominant fruit produced in the region and survey data reflect this. Survey respondents documented the production of over 344 million pounds of apples, more than 90% of the fruit tonnage reported by respondents. Fresh and processed markets are both vital market channels for producers in the Genesee Valley region. Out of the total pounds of fruit marketed by all respondents, 45.6% went to the fresh market (Table 14). Because apple production is so dominant, this is heavily weighted by the percent of apples sent to the fresh market; 47.7% of all apples were sent to the fresh market while 52.3% went to processor markets. This split in the market shares for fresh versus processed products, is just slightly different than that reported by New York's National Agricultural Statistics Service field office which reports 53% fresh/47% processed for the 2010 apple crop.

Shifts in these market channels may occur in the future as the sliced apple market continues to grow. Sliced apples are becoming a very important market channel for apple producers. Consumption is growing quickly and grower prices are excellent compared to other processing alternatives. The U. S. Department of Agriculture's *U. S. Apple Statistics* reported that in 2004 51 million pounds of apples were utilized in fresh slices while in 2011 that number increased to 131.4 million pounds. In addition, grower prices in 2004 were \$186 per ton and in 2011 were \$384 per ton. One survey respondents reported, "Fresh apple slice sales returns are the best in the market."

Table 14. Annual Fruit Production from Survey Respondents

Crop	Total respondent production	% Fresh	% Processed
	Lbs	%	%
Apples	344,324,809	47.7	52.3
Grapes	19,985,378	8.1	91.9
Peaches	2,679,025	37.3	62.7
Tart Cherries	2,166,445	0.7	99.3
Pears	391,800	59.0	41.0
Sweet Cherries	235,500	99.7	0.3
Other Tree Fruit	962,000	94.8	5.2
Strawberries	712,445	88.9	11.1
Blueberries	335,000	97.0	3.0
Cane Berries	123,791	100.0	0.0
All fruit	371,916,193	45.6	54.4

Apple producers in the region can sell apples for slicing to a few plants. New York has two plants that slice and package apples in individual servings for foodservice channels, primarily for schools. Pennsylvania and Michigan also have companies that purchase apples for slicing from New York growers. Some confusion about what to call the sliced apple market, fresh or processed exists. While some growers indicated that they consider sales to slicers as

“fresh market”, the National Agricultural Statistics Service currently reports apple slicing activity under “processed”. National data on fresh versus processed fruit utilization can be found in Appendix Table A.

Other processed apple products include canned (including applesauce), dried, and cider and juice.

**Vegetable Production.** Respondents produced roughly twice the tonnage of vegetables as fruit. These farms produce an average of 726 million pounds of vegetables, 34.3% of which were sold to the fresh market and 65.7% to the processed market (Table 15).

The production of vegetables for processing is much more important in the Genesee Valley region than in the rest of New York. The National Agricultural Statistics Service, New York Field Office reports that 17% of vegetables statewide were sold for processing (*Vegetable Report, 2011 Annual Summary. January 2012. No 984-1-12*). However, the 2007 Ag Census, which reports county-based data, reported 67% of vegetables produced in the counties in the Genesee Valley region were for processing. The difference between averaged state production data and regional production is enormous, therefore, state data should not be used as benchmarks for the region. National data on fresh versus processed vegetable production of some of the major crops can be found in Appendix Table B.

Table 15. Annual Vegetable Production from Survey Respondents

Crop	Total respondent	% Fresh	% Processed
	production		
	lbs	%	%
Cabbage	199,757,581	69.7	30.3
Potatoes	149,189,835	11.0	89.0
Sweet Corn	94,613,850	3.0	97.0
Snap Beans	72,834,448	1.2	98.8
Beets	53,296,300	0.4	99.6
Winter Squash	36,735,666	45.8	54.2
Carrots	32,700,210	0.0	100.0
Onions	28,333,870	92.1	7.9
Tomatoes	18,450,070	98.9	1.1
Peas	9,489,260	0.1	99.9
Pumpkins	1,557,625	96.5	3.5
Other Vegetables	29,549,017	92.0	8.0
Cucumbers	3,304,877	92.4	7.6
Spinach	2,098,100	0.0	100.0
Asparagus	33,120	97.3	2.7
Bell Peppers	32,488	100.0	0.0
Miscellaneous <sup>1</sup>	51,072	100.0	0.0
Melons	91,575	100.0	0.0
All Vegetables	726,599,308	34.3	65.7

<sup>1</sup> Miscellaneous vegetables include broccoli, cauliflower, eggplant, garlic, greens, hops, lettuce, okra, popcorn, radishes, shallots, summer squash, and zucchini

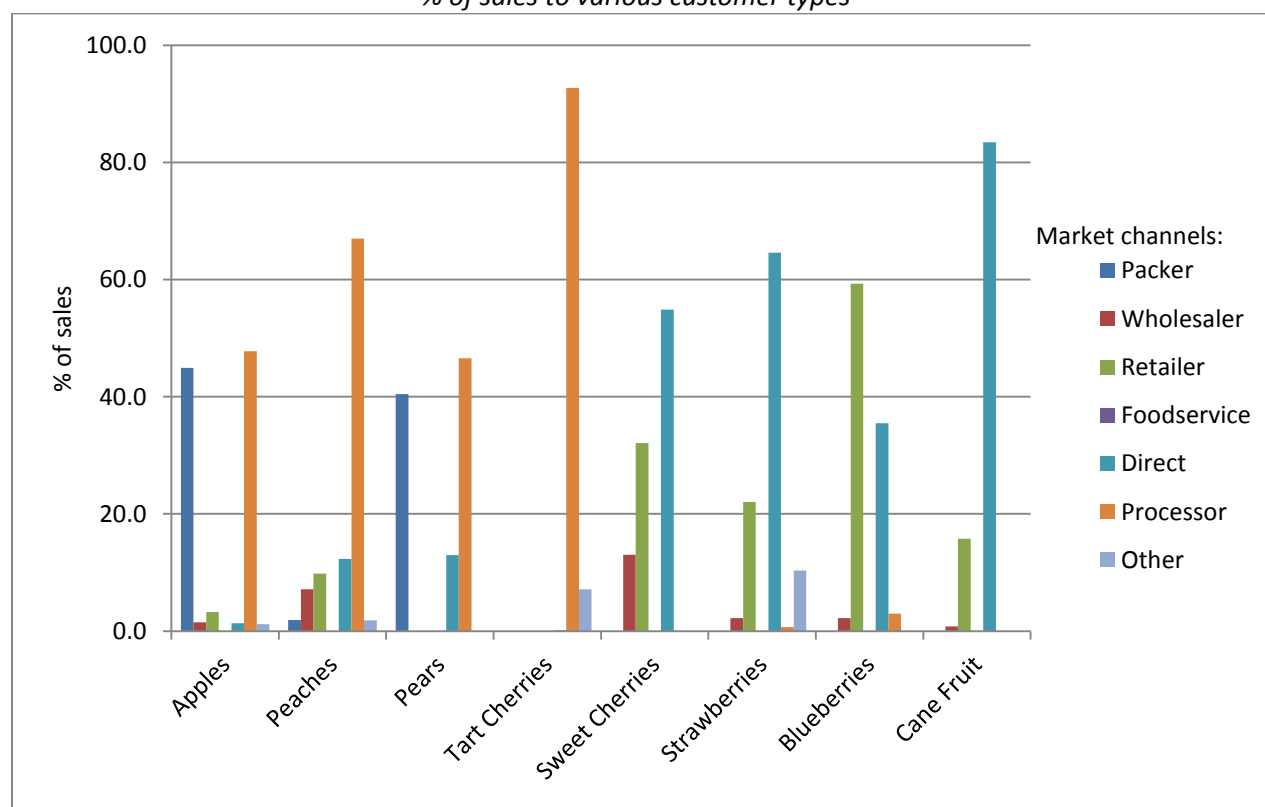


The portion of vegetable production sold to the processing market varied widely by crop. Almost the entire crops of sweet corn, peas, snap beans, carrots, and beets went to the processed market. The Genesee Valley region has processing plants owned and operated by Seneca Foods, the market leader in canned vegetables that also has plants across the United States. The plants recently purchased by Bonduelle North America, a division of the Bonduelle Group in France, were previously owned and operated by Allen's Inc. and prior to that by Birdseye. These are all leaders in the processed vegetable industry who have made important contributions to the industry in the region. In addition, the region has a GLK Foods plant (Great Lakes Kraut) that processes sauerkraut, and a Mott's plant (Dr. Pepper Snapple Group) that processes juice and applesauce. The presence of these plants as well as other repackers and service providers that repackage frozen foods undoubtedly offer a vital processor base to certain crops in the region.

## Market Channels

The survey asked growers to describe the channels they used to market their crops. They were asked for the sales distribution for each of their leading crops. Figure 4 displays the aggregated sales distribution of each major crop from the region by marketing channel, including packer/shippers, wholesalers/distributors, retailers, foodservice, direct to consumer, processors, and an "other" category. Mapping the market channels of the commodities provides information about how the product travels to the consumer and the various entities involved in taking ownership of the product. In a sense it also provides a picture of what kind of "services" or "value added" is needed to take the product from the farm to the consumer.

Figure 4. Sales Distribution by Market Channel – Fruit  
--% of sales to various customer types--



In most cases, apples from the region are channeled from the farm to either a packing facility or a processor. The packing facility adds value by sorting, washing, sizing, grading, storing, and finding a customer for the product, while the processor adds value by transforming the product into slices, juice, sauce, canned fruit, etc. or other convenient and or shelf-stable product.

Almost 93% of tart cherries are sent to processors. Strong demand for tart cherry products, such as dried cherries and cherry juice, continues, and very few tart cherries are sold fresh. Fresh sales are sold primarily to consumers who use them in cooking. The processing market for peaches and pears takes 67.0% of the peaches and 46.5% of pears produced by respondents. According to industry sources, the peach market for processing is somewhat weak. Peaches for processing are sent to plants in Michigan and fuel costs are impacting the economics of transportation. According to one respondent, “The market for processing peaches is too far away and the market is volatile...”

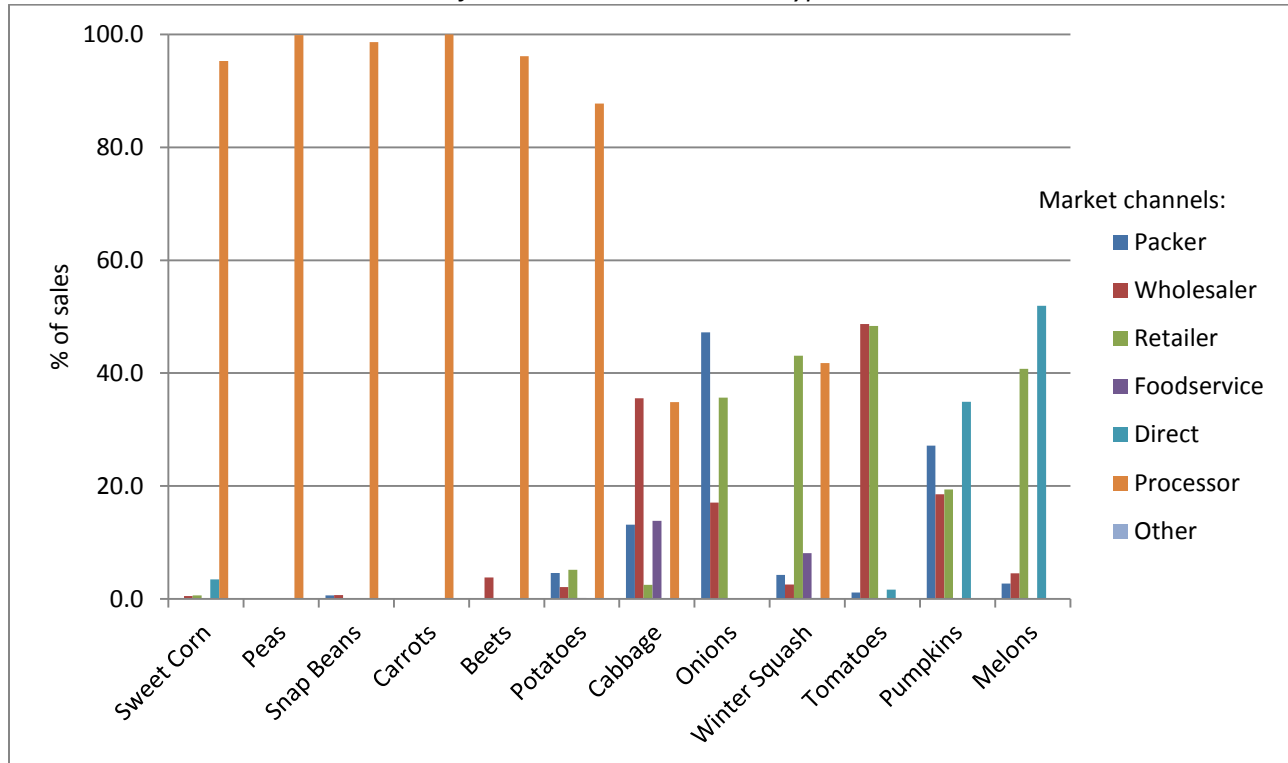
Sweet cherries, strawberries, blueberries, and cane fruit, primarily raspberries, are sold almost exclusively for the fresh market, and most of the sales are direct to the consumer. The exception is blueberries, which are sold through retail more than direct sales. These products, in general, are primarily consumed fresh by the consumer. Production levels in the region for these products are small.

Some vegetables are sold almost exclusively through processed marketing channels. These were primarily the crops processed by the region’s processors and include sweet corn, peas, snap beans, carrots, and beets (Figure 5). In addition, these farms are so large, their volume masks the data from smaller farms producing for the fresh, and often direct to consumer, markets. In general, vegetable growers producing for the processed market usually do not produce for the fresh market. This could be a function of the capital and equipment that would be needed to work both processing and fresh markets, or it could be a function of management demands needed for both operations. Supplying the fresh markets often requires a different set of crop varieties, planting, harvest, labor, and postharvest requirements as well as a different set of management and sales skills than does the processed market.

Most of the potatoes produced in the region (87.7%) are sold to chip processors. Processors are a vital market for cabbage producers as well, purchasing 34.9% of respondents’ cabbage sales. The GLK (Great Lakes Kraut) plant in the region also sources cabbage from the region.

The distribution of sales for the other vegetable crops is quite different. With the exception of winter squash, respondents reported that sales of onions, tomatoes, pumpkins, and melons moved through a combination of packers, wholesalers, and retailers. Only winter squash moved some volume (41.8%) of sales to processors. The sales distribution information for “Other vegetables” was too limited to report.

Figure 5. Sales Distribution by Market Channel – Vegetables  
 --% of sales to various customer types--



Note: Sales data for "Other vegetables" too limited to report

## Direct to Consumer

In the 2007 Census of Agriculture, direct marketing sales of all agricultural products for human consumption in the Genesee Valley region were reported to be \$11.4 million. This is approximately 0.9% of the sales of all agricultural products sold in the region. Sales of fruits and vegetables are likely a large portion of these sales as many agricultural products such as milk, grains, and dry beans are not usually sold through direct marketing channels. Most of these sales are probably sales of fresh versus processed products.

In the section above, the proportion of respondents' sales moving through direct marketing channels was estimated and presented by crop. The volume of respondents' fruits and vegetables moving via direct marketing channels are estimated and presented below in Table 16. Survey respondents only represented roughly 40% of the region's fruit and vegetable acreage, therefore, there is likely more production marketed direct than reported here.

Apples and sweet corn topped the list of crops in direct marketing volumes. According to respondents, about 4.6 million pounds of their apples were sold direct to consumers through farm stores, farms stands, farmers' markets, u-picks, and CSAs. We believe most direct to consumer sales are likely consumed within the region. Therefore, this represents about 7.4% of estimated total apple consumption in the region. The remaining 92.6% of the apples (fresh and processed) would be purchased from the normal outlets such as grocery stores and foodservice establishments. If we assume that most direct to consumer sales are "fresh", then respondents'

direct apple production represents 22.2% of fresh apple consumption in the region. This is quite a significant number, and additional research in this area is needed before making any decisions based on this estimate.

Respondents' direct to consumer volume represented 9.9% of total sweet corn consumption and 27.2% of fresh sweet corn consumption. Most fresh sweet corn consumption is seasonal and sweet corn production in the area is significant.

Table 16. Respondents' Direct Marketing Volumes and  
Percent of Estimated Regional Consumption

	Respondents' direct marketing volume	% of estimated total regional consumption	% of estimated regional fresh consumption
	<i>lbs</i>	%	%
<b>Fruits</b>			
Apples	4,610,886	7.4	22.2
Peaches	304,052	2.7	5.1
Pears	35,500	0.5	0.9
Cherries (Sweet and Tart)	126,100	4.6	8.0
Strawberries	460,335	4.3	5.4
Blueberries	118,600	7.6	11.9
Cane Fruit	84,732	8.9	17.9
Total Fruit	5,740,205	6.0	13.6
<b>Vegetables</b>			
Sweet Corn	3,178,200	9.9	27.2
Peas	2,100	0.1	NA
Beans (Snap)	11,010	0.1	0.4
Carrots	8,000	0.1	0.1
Beets	8,615	1.4	NA
Cabbage	18,000	0.2	0.2
Potatoes	222,335	0.1	0.5
Onions	3,350	0.0	0.0
Winter Squash	51,250	0.9	0.9
Tomatoes	304,195	0.3	1.3
Pumpkins	533,000	9.0	9.0
Melons	47,570	0.1	0.1
Total Vegetables	4,387,625	1.1	2.5
Total Fruits and Vegetables	10,127,830	2.0	4.6

NA = not available. Fresh consumption of these crops is not reported separately in the USDA Food Availability Data System.

Consumers tend to buy more fresh berries than processed, and they prefer to buy them in season. This would seem to favor direct to consumer marketing, yet direct to consumer volumes only represented 5.4% of regional consumption of strawberries, 11.9% of blueberries, and 17.9% of raspberries. Berry volumes may have been underreported in the survey as many direct marketers did not report volumes of minor crops which often included berries.

Underreporting may have been an issue with some vegetable crops as well. Farms that primarily use direct marketing channels often grow a variety of mixed vegetables in order to provide an array of products for their customers. Snap beans, beets, tomatoes, and carrots are often staples of farm stands as well as lettuce, greens, peppers, cucumbers, squash, and many other crops that could not be reported here because of insufficient data. Recording production and sales volumes of each crop appears to be an issue for small farms. Easy record keeping systems could help these producers keep track of production and sales and therefore help them assess and improve profitability. There may be opportunities to expand production of these vegetable crops for direct markets, but, additional research may be needed to validate this.

Respondents use farm stands and stores, farmers' markets, CSAs, and other methods to sell directly to consumers. They reported that 51.4% of their direct market sales moved through farm stores or farm stands, 33.3% through farmers' markets, and 4.3% through CSAs (Table 17). Other direct opportunities (10% of direct market sales) included u-picks, festivals, auctions, and on-farm processing. CSAs have been popular with consumers. Increasing sales through CSAs might be an opportunity for direct marketers.

Table 17. Percent of Direct Sales through Various Direct Marketing Channels

Direct Markets	% of direct market sales
Farm Stores and Stands	51.4
Farmers' Markets	33.3
CSAs	4.3
Other	10.0

## Regional Sales

One of the objectives of the study is to describe where fruits and vegetables produced in the region are sold. Many consumers interested in the "local" movement are interested in consuming foods produced locally and supporting local farmers and the local economy. They may also support locally-produced foods because they believe foods locally-produced and consumed move through shortened supply chains and are therefore more sustainable. Because of the consumer demand, local, state and federal policy makers are also interested in learning more about where their foods are produced.

Product flow is extremely challenging to describe quantitatively as there are no data collection programs whose purpose is to analyze product flows. This project quantifies off the farm, first handler sales to customers within the region. It then uses secondary data to describe general fruit and vegetable movement beyond the first handler.

We asked growers to report the percentage of their sales to customers within the region for each of their leading crops. Customers were first-handlers of their products and not necessarily end consumers.

Responses vary widely by crop. Those selling primarily through direct to consumer markets (farm stands, farmers' markets, and CSAs) are likely to have higher sales to customers within the region. This holds reasonably true with sweet cherries, strawberries, blueberries, cane fruit (Figure 6) and with melons (Figure 7).

The first handlers for many other crops are processors. Since some of these processors are located within the region, within region sales are high for these crops. This is the case for tart cherries as well as the major vegetable crops, sweet corn, snap beans, peas, carrots, and beets. After they are processed, these fruits and vegetables may or may not be sold and consumed within the region.

The remaining crops, apples, peaches, pears, sweet cherries, cabbage, potatoes, onions, winter squash, tomatoes, and pumpkins sell to a wider variety of channels and a wider geography and product flows for these are harder to trace using the data from the project.

Figure 6. Percent of Sales to Customers within Region – Fruits

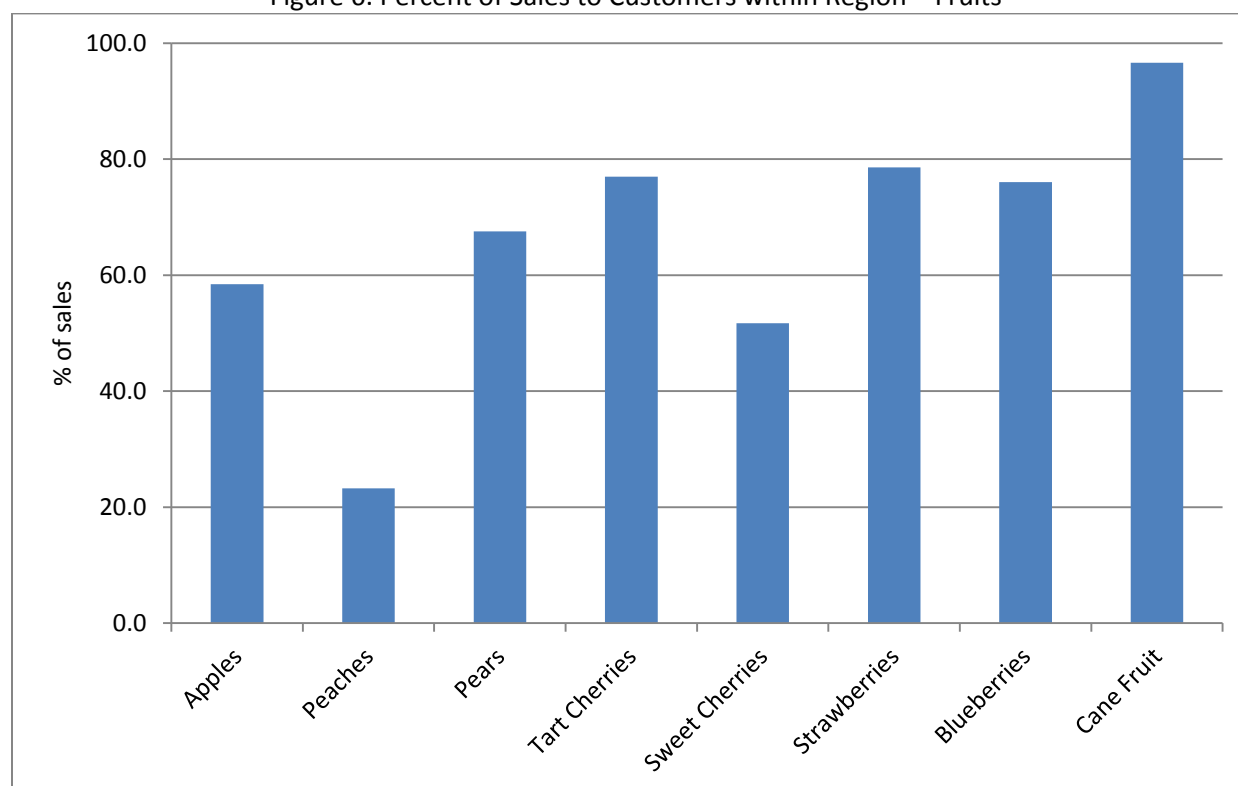
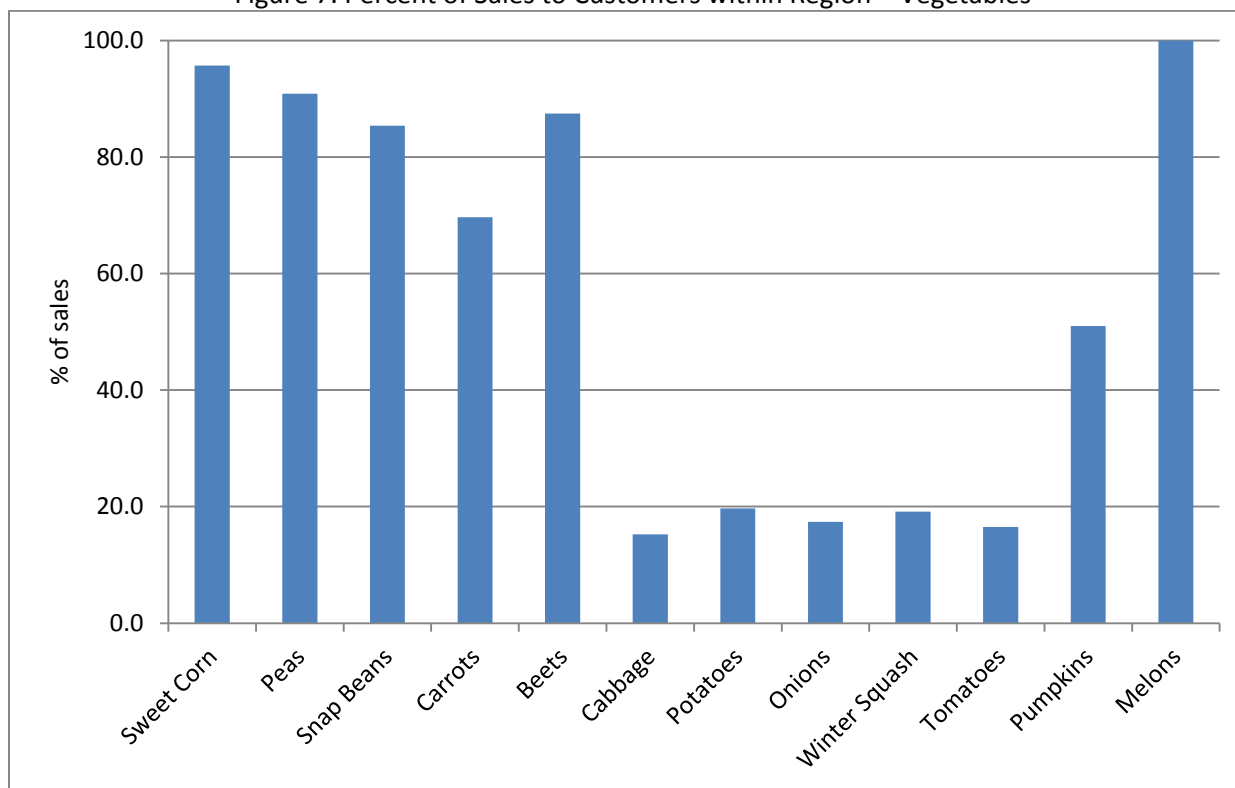


Figure 7. Percent of Sales to Customers within Region – Vegetables



Note: Sales data for “Other vegetables” too limited to report

## Production Outlook

Survey respondents were asked to estimate percent production changes by 2015 for each of their primary crops. Fruit growers predict positive growth in apples, tart cherries, blueberries, and cane fruit (primarily raspberries) (Figure 8). Apple production is expected to increase about 13% by 2015. This growth rate applied to the large volume of apples produced in the region will result in a large increase in the tonnage produced. When asked why they are making this decision, one grower encapsulated most reasons with this comment, “Fruit production will expand because of new varieties coming into the market place and increased demand for fresh fruits.”

Respondents reported that disease issues in New York and competition from other production areas negatively impacting the peach and pear production. In addition, the “market for processing peaches is too far away and market is volatile because of foreign competition,” according to a peach grower, and according to a pear grower, “Growing pears on the east coast is a waste of time.”

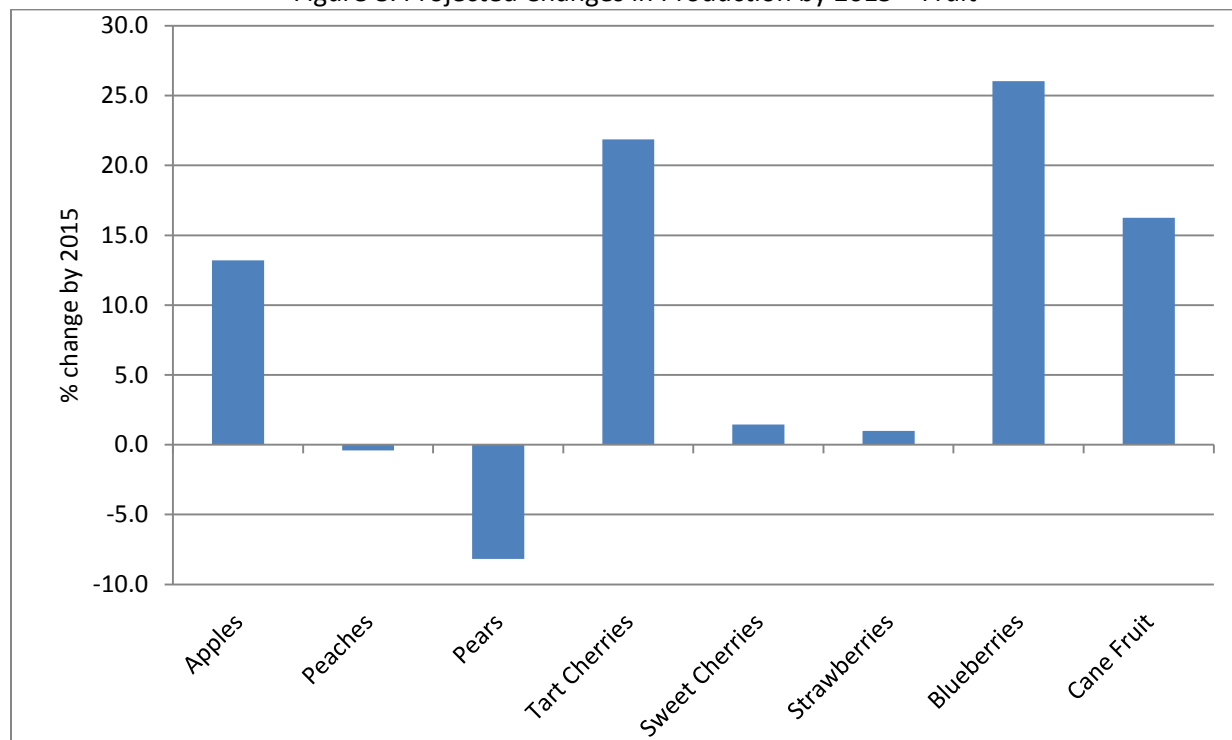
Respondents predicted larger growth rates for tart cherries, blueberries and cane fruit. The base volume on these crops is much smaller and the tonnage increases much less than for apples, however, these increases could have an important impact on the respective farms.

The increases in tart cherry production are likely a combination of replanting after orchard damage during a recent severe ice storm and increased plantings due to strong demand continuing for cherry juice and dried cherries.

Consumer demand for berries continues to be strong. According to the retail scan information available from the Perishables Group FreshFacts, Powered by Nielsen, the berry category is the leading fresh fruit category in terms of retail store sales (Chanil and Major, 2011b).

In general, fruit production requires long-range planning. For example, trees require 4-5 years growth before they begin to bear marketable fruit. Plans for 2015 have already been implemented and the trees planted.

Figure 8. Projected Changes in Production by 2015 – Fruit

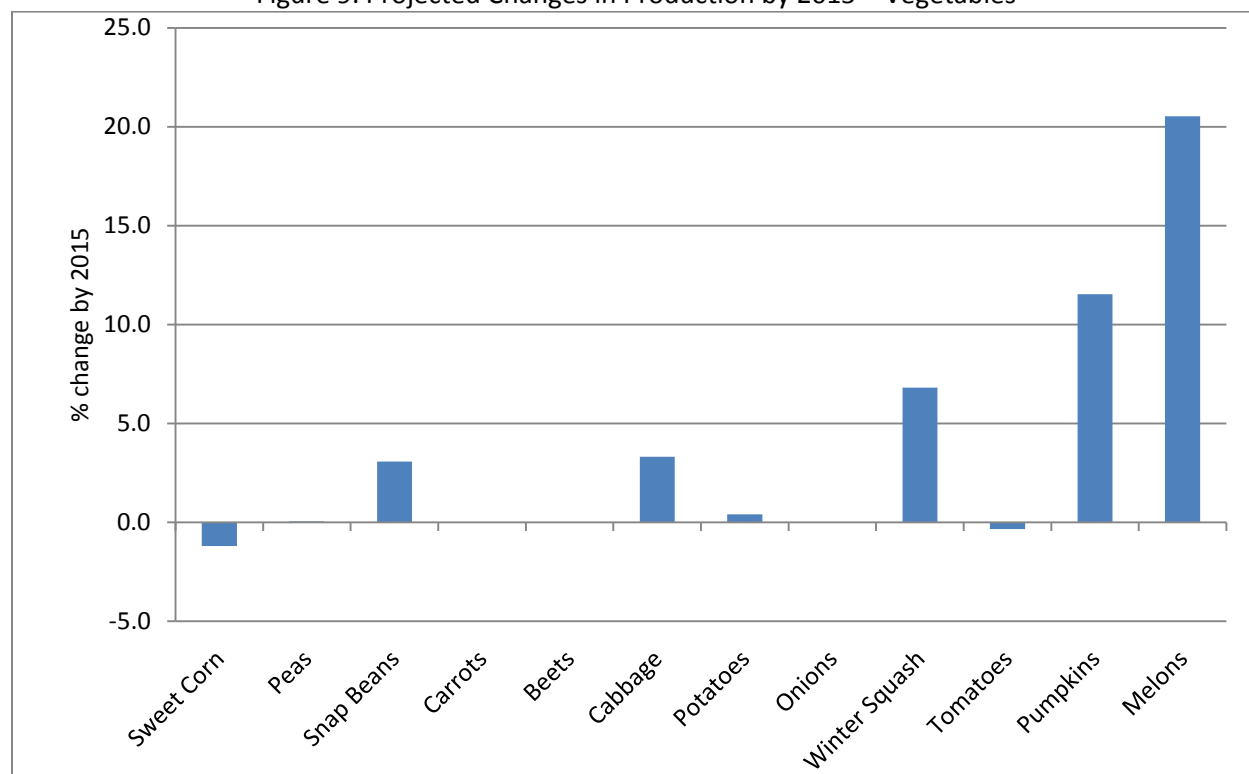


Projected growth for most of the vegetable crops is more conservative. In particular, many growers of the largest vegetable crops in the region, sweet corn, peas, snap beans, carrots, and beets, were uncommitted and hesitant to make many growth projections (Figure 9). Most of the uncertainty in production forecasts for these crops was because one of the major processors in the region had announced they were offering their plants for sale. Bonduelle North America purchased two processing plants from Allen's, Inc. in the region in March 2012, after the survey was mailed, and growers of processing vegetable crops were uncertain of any production volumes for 2012 let alone by 2015, "Our vegetables go for processing. We don't know what their plans are for the years ahead. We are waiting."



Growers also commented about market opportunities for crops other than vegetables, indicating better prices for most field crops and dairy feeds. Although vegetables fit well in rotation with field crops and dairy feeds, vegetable growers have some flexibility in plantings every season, unlike fruit growers' orchard investments, as markets for field crops change.

Figure 9. Projected Changes in Production by 2015 – Vegetables



Cabbage and potato growers projected slight increases in production. Winter squash producers project slightly larger increases of approximately 6.8%. The largest projected increases are in pumpkins and melons. The growth projections though are primarily from small growers and smaller crop acreages. While pumpkins are produced in the region for processing, most of the projected increases came from growers raising pumpkins for the fresh, fall holiday market.

Almost all of the melon production was for the direct to consumer markets and for retail sales as “local” product. Therefore, even though growers projected a 20% increase in melon production, it is a 20% increase of a relatively small volume.

On average, potatoes and onion producers did not have plans to increase production. The leading vegetable in the U.S. diet, measured in pounds per capita, is the potato. However, potato consumption per capita declined from about 2003 until 2010 (U. S. Department of Agriculture, Economic Research Service, 2011).

If climate changes alter the production landscape, it may affect growing conditions, benefiting production of some crops while harming others.

Changes in production may require changes in management and/or operations to achieve growth or to manage contraction. For those respondents intending to make production changes within the next 3 years, farm operations and sales may need to change accordingly. When asked what plans they were going to make to their business, a large majority of respondents, 72.5%, selected “Increase productivity of current land” (Table 18). The results of these plans are already evident in New York State apple production Orchards are being converted to ultra-high density plantings, increasing per acre yields in production and in fruit quality. Some small farms indicated they were going to extend the growing season with high tunnels to increase productivity.

Table 18. Plans to Manage Production Increases

Management Plans	% of Respondents
Increase productivity of current land	73.5
Increase sales to current customers	58.4
Add new customers	42.6
Invest in buildings or equipment	42.2
Use acreage from other crops/enterprises	40.2
Invest in additional acres	37.3
Hire additional employees	35.3
Add new marketing enterprise ( <i>e.g. direct marketing foodservice</i> )	21.8
Other	1.0

More than half of respondents have plans to increase sales to current customers and somewhat fewer than half indicated they plan to add new customers. In general, those who responded with explanations of these two aspects of management were the same respondents. Management strategies will have to coordinate customer development and sales with production increases. Developing new marketing enterprises or market channels is sometimes a strategy used to increase sales. Just over 20% of respondents plan to add a new marketing enterprise, such as direct market, foodservice channel, etc. This was the least popular response to this question and is one that may require more management, research, planning, and implementation than any other.

If farms are planning to decrease production, we are interested in how they will concomitantly adjust their management of the farm operation. The majority of those responding to this question, 68.1%, said they would “use acreage for other crops/enterprises” (Table 19). Demand for more dairy and high field crop prices are exerting pressure on existing fruit and vegetable land. These respondents would have opportunities in other industries if they elect to reduce their fruit or vegetable operations. Some few respondents, 21.3% of those responding to the question, indicated they would retire or exit farming completely and some fewer yet, 8.5%, indicated they would divest acreage when reducing production.

Table 19. Plans to Manage Production Decreases

Management Plans	% of Respondents
Use acreage for other crops/enterprises	68.1
Retire or exit farming	21.3
Divest acreage	8.5
Other	10.9

### Greatest Challenges for Produce Enterprises

Respondents were asked to select their five greatest business challenges from a list provided in the survey. Availability of labor was selected by more respondents (64.7%) than any other business factor Table 20). “Labor regulations” was selected by the 48.8% of respondents and is closely associated with “availability of labor” as both relate to issues surrounding migrant labor, H2A visas, E-Verify, and the next Farm Bill. Regulations include federal as well as state regulations, which include minimum wage, workers comp, benefits, etc..

Table 20. Greatest Business Challenges

Challenge	% of Respondents
Availability of labor	67.4
Labor regulations	50.8
Profitability	48.2
Fuel cost	42.2
Environmental regulations	35.2
Availability of land	28.0
Finding new customers	24.9
Changing trends	22.8
Risky market conditions	21.2
Wage rates	20.2
Plant varieties	15.5
Land use regulations	11.9
Access to capital	8.3
Availability of management	7.8
Harvest technology	7.8
Customer requests	7.3
Agriculture infrastructure	5.7
Transportation infrastructure	5.7
Sustainable production assistance	4.7
Postharvest technology	4.1
Effective farm associations	3.1

In addition to serious concerns about availability, labor regulations emerged as the second most important challenge facing fruit and vegetable farms. The distinction between grower concerns about the availability of human resources and about government labor regulations not always easy to discern. Availability of labor is not simply an issue about the lack

of people willing to perform difficult farm jobs. It is often associated with availability of migrant workers, here legally or otherwise, as well. Whatever the political environment surrounding migrant workers and immigration policies might be, the fact is that these regulations negatively affect farm business operations and profitability. If the regulations are not revised, the damage to the agricultural economy continues.

Availability of labor was reported to be a major concern by large farms more than small farms and by fruit farms more than vegetable farms (Figure 10). Processing vegetable operations are less labor intensive than their fresh product counterparts, and, in general, larger farms need more labor from all available sources than smaller farms. Many respondents vigorously described their frustrations about labor availability and labor regulations (Figures 10 and 11).

Figure 10. Greatest Challenges – Availability of Labor, by Annual Sales and Farm Type

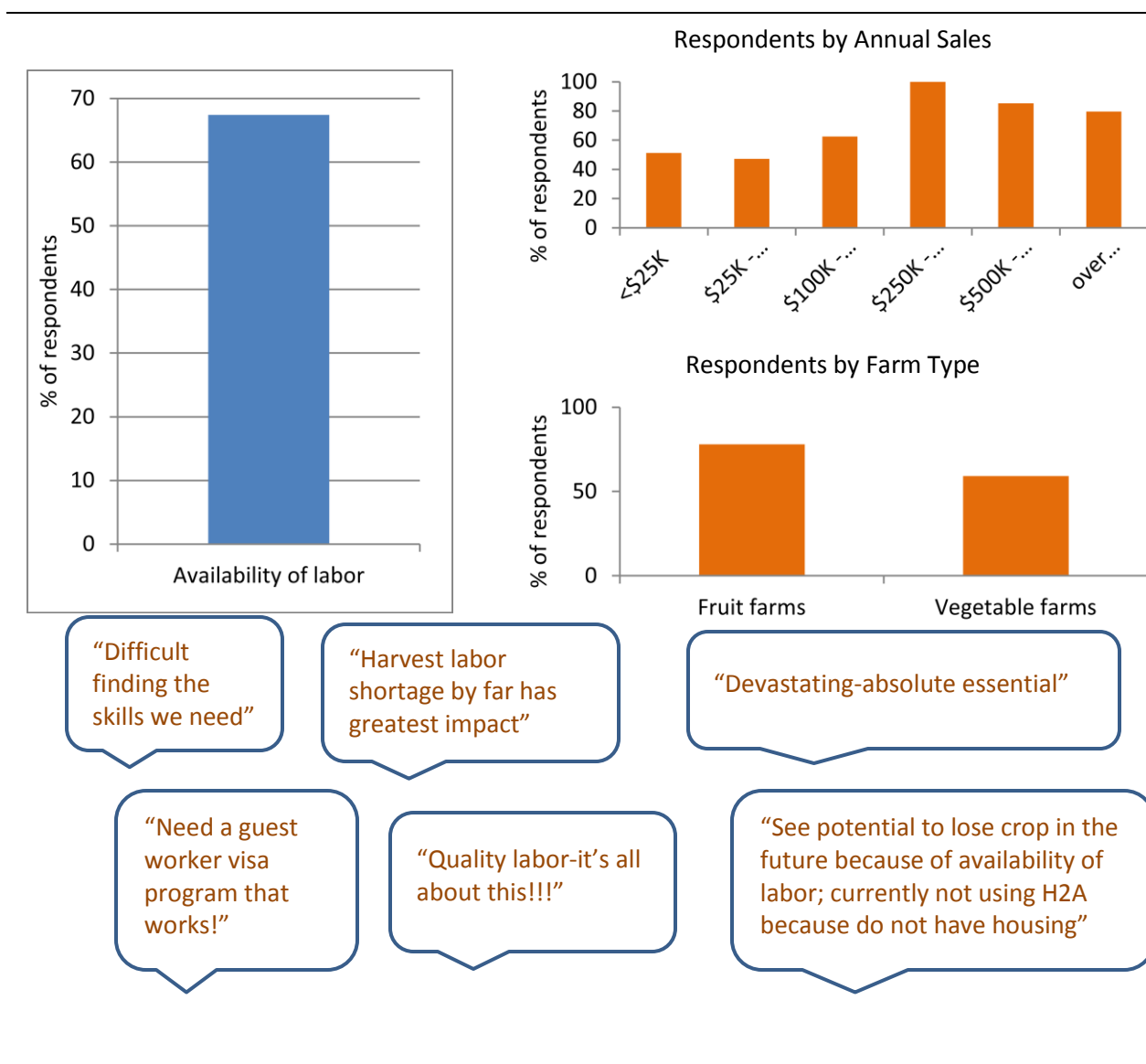
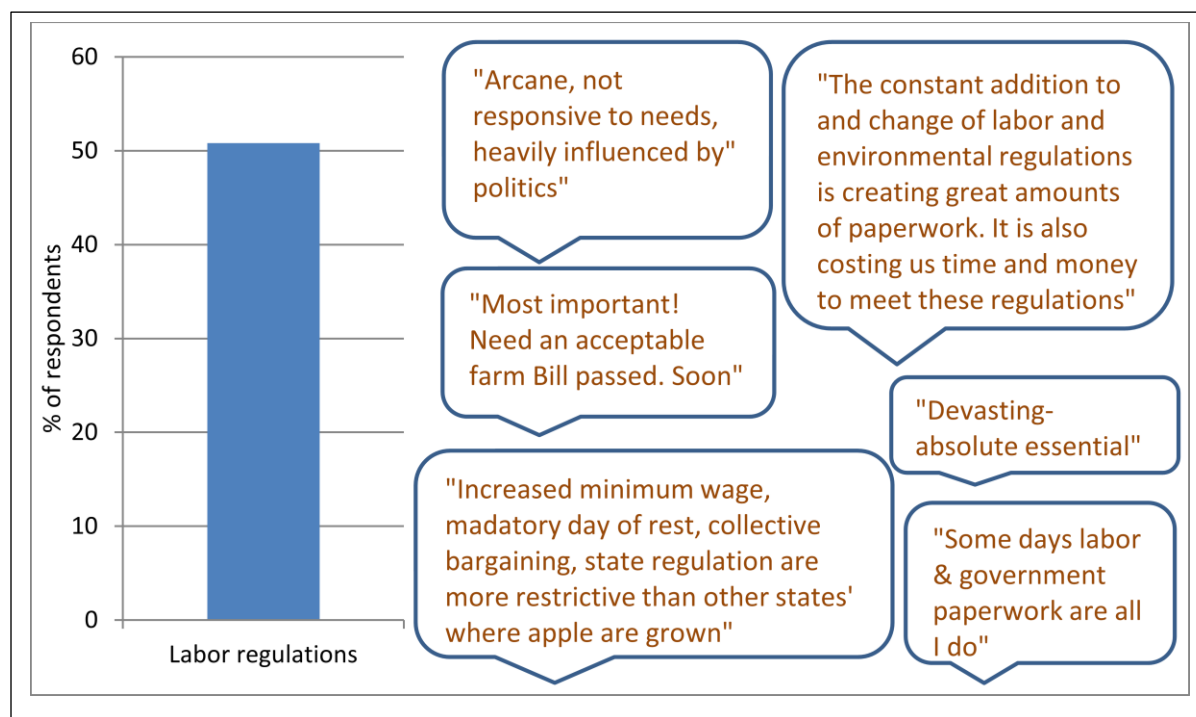


Figure 11. Greatest Challenges – Labor Regulations, Respondent Comments



Challenges of profitability and fuel costs tallied third and fourth behind labor regulations (Table 20). Some other business challenges, ones that sometimes have received a lot press were not selected by as many growers. Availability of land, risky markets, and access to capital are challenges sometimes raised by growers as constraining their profitability; however, they rank well behind the leading issues reported above. Responses vary somewhat by farm type or size (Table 21).

Profitability may be most challenging for the smallest respondents. Smaller volumes and fewer economies of scale are likely some reasons why this would be. Profitability was selected as a challenge by two-thirds (66.7%) of the smallest respondents, yet only by 47.9% overall.

One of the goals of the project sponsors was to determine how important land availability is to growers in the region. Concerns have been voiced about how hard it is to find land for expansion. Land cover data from the National Oceanic and Atmospheric Administration seems to indicate that most of the productive land is being farmed and little productive land is unused and in scrub or grasslands. High prices for agricultural land are reported word of mouth in some areas of the region. When we examined the responses to “availability of land” in the survey, it ranked 6th overall. Vegetable respondents selected availability of land as a business challenge more than fruit farmers did, 35.2% of vegetable growers versus 17.9% of fruit growers. Even this response by vegetable growers though only raised “availability of land” to 5th ranking when compared to other challenges for the vegetable growers. It may be an issue for some growers depending on their location or industry, but at this time it is not as systemic or pervasive or important as the leading issues of labor and profitability.

Table 21. Business Challenges – Selected Responses and Comments

Challenge (% of respondents)	Affect by farm type	Comments														
Profitability (47.9%)	<table><caption>Profitability: Affect by farm type</caption><thead><tr><th>Income Range</th><th>% of respondents</th></tr></thead><tbody><tr><td>&lt;\$25K</td><td>65.0</td></tr><tr><td>\$25K - \$99,999</td><td>40.0</td></tr><tr><td>\$100K - \$249,999</td><td>45.0</td></tr><tr><td>\$250K - \$499,999</td><td>40.0</td></tr><tr><td>\$500K - \$1,000K</td><td>50.0</td></tr><tr><td>over \$1,000K</td><td>35.0</td></tr></tbody></table>	Income Range	% of respondents	<\$25K	65.0	\$25K - \$99,999	40.0	\$100K - \$249,999	45.0	\$250K - \$499,999	40.0	\$500K - \$1,000K	50.0	over \$1,000K	35.0	<p><i>“Low margins make it difficult to justify additional investments in farm”</i></p> <p><i>“A concern for non-controllable costs”</i></p> <p><i>“Trying to balance production &amp; marketing”</i></p>
Income Range	% of respondents															
<\$25K	65.0															
\$25K - \$99,999	40.0															
\$100K - \$249,999	45.0															
\$250K - \$499,999	40.0															
\$500K - \$1,000K	50.0															
over \$1,000K	35.0															
Availability of land (28.0%)	<table><caption>Availability of land: Affect by farm type</caption><thead><tr><th>Farm Type</th><th>% of respondents</th></tr></thead><tbody><tr><td>Fruit farms</td><td>18.0</td></tr><tr><td>Vegetable farms</td><td>35.0</td></tr></tbody></table>	Farm Type	% of respondents	Fruit farms	18.0	Vegetable farms	35.0	<p><i>“Difficult to find additional ground close enough to home farm to work economically”</i></p> <p><i>“High price, everybody wants it”</i></p> <p><i>“Can’t expand”</i></p>								
Farm Type	% of respondents															
Fruit farms	18.0															
Vegetable farms	35.0															
Risky market conditions (21.2%)	<table><caption>Risky market conditions: Affect by farm type</caption><thead><tr><th>Farm Type</th><th>% of respondents</th></tr></thead><tbody><tr><td>Fruit farms</td><td>15.0</td></tr><tr><td>Vegetable farms</td><td>25.0</td></tr></tbody></table>	Farm Type	% of respondents	Fruit farms	15.0	Vegetable farms	25.0	<p><i>“Due to economy, trends, and weather, you never know for sure how much to bring to market and when”</i></p>								
Farm Type	% of respondents															
Fruit farms	15.0															
Vegetable farms	25.0															
Access to capital (8.3%)	<table><caption>Access to capital: Affect by farm type</caption><thead><tr><th>Income Range</th><th>% of respondents</th></tr></thead><tbody><tr><td>&lt;\$25K</td><td>15.0</td></tr><tr><td>\$25K - \$99,999</td><td>8.0</td></tr><tr><td>\$100K - \$249,999</td><td>6.0</td></tr><tr><td>\$250K - \$499,999</td><td>5.0</td></tr><tr><td>\$500K - \$1,000K</td><td>5.0</td></tr><tr><td>over \$1,000K</td><td>10.0</td></tr></tbody></table>	Income Range	% of respondents	<\$25K	15.0	\$25K - \$99,999	8.0	\$100K - \$249,999	6.0	\$250K - \$499,999	5.0	\$500K - \$1,000K	5.0	over \$1,000K	10.0	<p><i>“The greatest concern in the future for us is the incredible amount of capital which is required to do business and sustain some growth. Access to \$ is not a problem but it is hard to justify \$250,000 for a combine, \$200,000 tractors 3-\$5,000/acre land, \$4 fuel add this to instability in market prices for goods we buy and sell”</i></p>
Income Range	% of respondents															
<\$25K	15.0															
\$25K - \$99,999	8.0															
\$100K - \$249,999	6.0															
\$250K - \$499,999	5.0															
\$500K - \$1,000K	5.0															
over \$1,000K	10.0															

Access to capital was not an important issue overall. Only 8.3% of respondents selected it as one of their five major challenges. For those with good credit, good records, and proven records, access is not limiting their business. More respondents in the smallest revenue category (15.4%) did select it as one of their primary challenges. One producer stated, however, that while access to money is not an issue, the real issue for them is whether they should make capital investments in an unstable market (Table 21).

Business factors impact farms differently, depending on each farm's situation. Some of the factors cited in this survey are great challenges to some farms, but are minor challenges to others. The factors most challenging for all, however, are those that should be a priority for the support and service community, including policy makers. In general, factors that are the most challenging are beyond that control of individual farms. Availability of labor and labor regulations are the most vital concern. While farms can manage around these two challenges as best they can, the core issues are beyond their ability to manage.

Profitability embodies all aspects of the farm business enterprise. While it is a vital concern, it would need to be dissected to determine which parts of the farm business are the most important challenges. This was beyond the scope of this survey but still an important area of concern.

## Project Summary

Overall per capita consumption of fruits and vegetables has slumped over the past decade, most notably in processed fruits and vegetables, including frozen, canned, and juices. Retail dollar sales are strong but have been boosted primarily by innovations in packaging and value-added, and volume increases have been due to simple population growth, not to increases in per capita consumption.

The Genesee Valley region of New York has a strong fruit and vegetable community that includes producers, packers, shippers, and processors. Some fruit and vegetable crops and processed products are produced in large volumes and sold along the east coast, nationally, and internationally. In particular, these crops include:

- apples, grapes (wine), tart cherries, beans (snap), beets, cabbage, carrots, onions, peas (green), potatoes, pumpkins, sweet corn, and squash (winter)

Exports of all crops, fresh as well as processed, to outside the Genesee Valley provide income to the growers, packers, shippers, processors, and distributors in the region, and these sales are an important contribution to the region's economy.

A large portion of the region's growers sell their crops to fruit and vegetable processors. Most of the processors in the region are category leaders in retail grocery shelves. Yet, with weak sales growth in canned and frozen foods, research into new markets, product development, or perhaps innovative sales strategies might be worth pursuing. If any of the processors leave the region, it will greatly and negatively impact the production of fruits and vegetables in the region.

The production of minor crops also generates economic benefits to farm businesses and consumers. Farmers directly market many of these products. Specialization in these crops may provide niche opportunities and avoid direct competition with growers of the major crops. Efforts to extend the season for particular crops, consistently provide produce of excellent quality, and develop new, tastier varieties, along with enhanced sales promotions to new and returning customers will help direct marketers increase sales and profitability.

While berry crops are difficult to produce and distribute, consumer demand for berries is very strong and continues to grow. Support for new variety development, and improved production technologies and postharvest handling would enhance market opportunities for berry growers.

The apple industry has made great strides in production innovations to improve productivity and returns. However, this year's weather devastated the apple crop as well as the other tree fruit crops. Efforts to counter some of the new production challenges due to climate changes may be needed. Continued improvements in fresh markets as well as processed markets will be needed to keep up with production increases.

## Challenges

Labor is the most widely reported challenge for producers. The scarce, uncertain labor supply and burdensome labor regulations challenge growers' capacity to manage production, harvests, and profits. While farms try to manage labor as best they can, changing the political forces around immigrant labor and securing much needed policy reform has been beyond their ability.



Although availability of land was not one of the major challenges reported in this survey, the addition of two new yogurt plants in the region as well as support from state government for increased yogurt production and dairy production may present vegetable growers with incentives to switch to the production of dairy feeds. Similarly, high prices for wheat and corn may encourage growers to shift acres from vegetable to field crops. Over half of the survey respondents, 56.6%, conduct farm enterprises in addition to fruit and vegetable production. While a small number of respondents indicated they also have dairies, livestock or poultry/egg enterprises, a much larger number, 39.7%, reported that they also raise field crops. This diversified portfolio of farming operations should allow these farms to be more flexible and adapt to changing demand trends. Indeed, of those farms that might decrease fruit or vegetable production, 68.1%, said they would “use acreage for other crops/enterprises” (Table 19).

Business factors impact farms differently, depending on each farm’s situation. Some of the factors cited in this survey are great challenges to some farms, but of far less concern to others. The factors that most greatly impact the agricultural community, however, should be a priority for support and service communities, including policy makers. In general, factors beyond the control of individual farms are the most challenging.

### **Local Consumption**

Determining the portions of fruits and vegetables eaten in the region that are actually produced in the region is difficult. Direct marketed fruits and vegetables produced in the region are likely consumed in the region and are relatively easy to track using farm production information. This study estimated that approximately 2.0% of all fruit and vegetable consumption was produced and direct marketed by survey respondents. If we assume that direct marketed fruits and vegetables are primarily fresh versus processed, then this means 4.6% of fresh consumption is produced and direct marketed regionally. However, recording production and sales volumes of each crop appears to be an issue for small farms. Easy record keeping systems could help these producers keep track of production and sales and therefore help them assess and improve profitability. Acreage under production by survey respondents represented roughly 40% of the region’s fruit and vegetable acreage according to 2007 Census.

However, consumers are accessing many more regionally-produced fruits and vegetables than those that are direct marketed, and they can find regionally produced, local foods in a number of other retail outlets and in processed as well as fresh forms. Many supermarkets sell a significant volume of fresh, local produce when it is in season. Some restaurants also build menus around seasonal local produce. Some locally produced items are available in supermarkets but are not identified as such and are sold under private label. For instance, 70-75% of one leading retailer’s apple sales are from apples produced in New York but sold under its private label.

In addition, estimates from some industry sources have suggested that about three-quarters of the region’s consumption of canned beans, peas, and sweet corn are regionally produced. Seneca Foods is a market leader of these canned items and almost all of the vegetables processed at the regional Seneca Foods plants are grown in the region.

Additional estimates of regional consumption of some regionally produced fruits and vegetables will be the focus of a future report by the author.

### *Expanding local consumption*

Consumer interest in local foods continues to grow, and consumers in the region have expressed interest in increasing their consumption of local foods. Direct markets offer the means for consumers to buy local product from local farmers. Direct markets readily transfer information about where, by whom, and how the product is produced. However, the volume of local foods moving through direct markets is limited and inefficiently handled. In the 2007 Census of Agriculture, direct marketing sales of all agricultural products for human consumption in the Genesee Valley region were reported to be \$11.4 million. This is approximately 0.9% of the sales of all agricultural products sold in the region. One example of direct market inefficiencies was illustrated in a recent comparative of 15 case studies of five products flowing through three different supply chains (one direct market, one supermarket, and one intermediated by a wholesaler or cooperative). In almost every case, large loads delivered to supermarkets, even from long distances, proved to be more energy efficient modes of transportation than pickup trucks or vans used by direct marketers to sell at farmers' markets (King, et al., 2010).

Therefore, some researchers suggest that significantly expanding consumption of local foods depends on local producers' ability to access mainstream supply chains (King, Gómez, and DiGiacomo, 2010). Partnerships and cooperatives offer one means for direct marketers to gain access to economies of scale. Other businesses organized in various ways aggregate production, processing, distribution, and/or marketing functions and are operated for or by local producers. These alternative organizations require a change in the normal direct marketing model used by many small growers; however, they may be critical to achieve scale and expand consumption of locally produced foods.

In the Genesee Valley region, fresh products are only one form of local production. Locally produced and locally processed fruits and vegetables are also available in mainstream channels. However, these products are not readily identifiable as being local. They lack information about where, by whom, and how the product was produced or processed. Yet information about processed foods can, in some instances, be easier to convey on packaging than on bulk, fresh products. Traceability requirements for food safety reasons, may now make it possible to label processed products with "local" information. For example, QR codes (quick response codes) can be placed on packaging and scanned by smart phones for further information about the product and how it was processed. Some QR codes even link to short videos placed online. Research on the effect of labeling locally processed foods on consumption should be conducted before large investments are made.

Below are some marketing tactics that might be considered as ways to make local products more convenient for consumers to find, buy, and use:

- Whenever possible, label products or have signage that provides information about the farm or place of origin, so consumers know when they are buying local products.
- If appropriate, link local products into mainstream supply chains as well as direct markets to increase consumer access to local products. For example, about 75% of consumers' retail food dollars are spent in supermarkets or supercenters. Develop retailers as customers, if possible, and find ways for the local product to complement rather than compete with the mainstream product. An intermediate partner, such as an aggregator, business alliance, or cooperative might be necessary,
- Farm stores and farm stands sited along identified tourist trails, such as wine trails, and along commuter routes will be easier to find than farm stores on rural lanes,

- Farmers' markets should be located in easy in, easy out locations that are easy to access, such as other shopping venues or thoroughfares,
- Offer local products in venues that are open many days a week to provide consumers greater access to local products. Some farmers' markets are open only one or two days per week, which limits such access,
- Early research on direct markets to date has shown that labor needs limit the profitability of farmers' markets relative to other market channels. Using farmers' markets in ways to increase volume or reduce labor may include:
  - allowing farmers to cooperatively sell product rather than requiring farmers to man their own stalls,
  - using markets for CSA pickups, restaurant pickups, auctions, etc. to increase volume
- Offer consumers options to use alternate forms of payment, such as food stamps, electronic benefit transfer, etc. at farmers' markets to increase their ability to purchase local products,
- Consumers may find it easier to pay by the piece or by the quart or pint rather than by the pound, especially at farmers' markets or in busy locations that make it difficult to weigh product. Consider alternate forms of pricing to move product,
- Make sure to produce the crops, quality, and packaging that maximize convenience for consumers,
- Offer a variety of products that can be grown efficiently in the region, as well as different varieties that will maximize taste and extend the harvest and selling seasons. Introduce new varieties to generate interest and excitement,
- Tell consumers how to use your products, include uses that are contemporary and fit well into busy life-styles.

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## Appendix

Table A. Utilization of Fruit, Fresh Versus Processing Production

	Regional <sup>1</sup> (GVR Survey Respondents)		National	
	Fresh	Processed	Fresh	Processed
	%		%	
Apples	47.7	52.3	32.4	67.6
Grapes	8.1	91.9	15.6	84.4
Peaches	37.3	62.7	56.3	43.7
Pears	59.0	41.0	59.6	40.4
All cherries	10.4	89.6	61.5	38.5
Strawberries	88.9	11.1	78.9	21.1

<sup>1</sup> Government data on fresh versus processing fruit are not available at the county or regional level, therefore study survey data is used as a proxy  
Source: GVRMA survey data and U. S. Department of Agriculture – Economic Research Service, *2011 Fruit and Nut Yearbook*

Table B. Utilization of Vegetables, Fresh Versus Processing Production

Data Item	Regional <sup>1</sup>		National	
	Fresh	Processed	Fresh	Processed
Beans, Snap	19.2	80.8	28.3	71.1
Beets	0.3	99.7		
Cabbage, Head	79.9	20.1		
Carrots	23.8	76.2	76.5	23.5
Onions, Dry	91.2	8.8		
Peas, Chinese (Sugar & Snow)	100.0	0.0		
Peas, Green (excl Southern)	26.5	73.5		
Potatoes	30.8	69.2	31.0	69.0
Pumpkins	100.0	0.0		
Squash, Summer	100.0	0.0		
Squash, Winter	na			
Sweet Corn	14.0	86.0	9.9	90.1
Tomatoes, in the open	100.0	0.0	10.9	89.1

<sup>1</sup> Agricultural Census 2007 data on fresh versus processing vegetable production acreage at the county level and production yield information were used to calculate regional estimates

Source: U. S. Department of Agriculture – 2007 Agricultural Census, Cornell calculations, and U. S. Department of Agriculture – Economic Research Service, *2011 Fruit and Nut Yearbook*

## GENESEE VALLEY REGION FRUIT AND VEGETABLE STUDY

We hear stories from growers and buyers in your region that current demand for some fresh market products cannot be met by current production. Our purpose is to examine trends in production in your specific region. We will then be able to match research and Extension activities to your needs and help guide policies affecting production in your region. The project is funded through the Genesee Valley Regional Marketing Authority and NYS Department of Agriculture and Markets and is managed through Cornell Cooperative Extension Wayne County.

All responses will remain confidential. Reported results will be in aggregated form only.

**Please return by March 16, 2012**

If you have any questions, contact:

Kristen Park, Cornell University, 31 Warren Hall, Ithaca, NY 14853; (607) 255-7215 or [ksp3@cornell.edu](mailto:ksp3@cornell.edu).

If you prefer, an online version of the survey may be found at: <http://hortmgt.gomez.dyson.cornell.edu/GVRMA.html>

### I. GENERAL QUESTIONS

*This survey asks questions about fruit, vegetable, hops, and small grains production for human consumption only. Small grains include wheat, buckwheat, barley, and oats. We are also including such crops as hops for beer, nuts, mushrooms, and popcorn.*

1. Approximately how long has your farm been in business? \_\_\_\_\_ years
2. Please list the average number of acres used in your farm productions in 2011. *(please include all rented and leased land)*

	<b>for total farm production</b>	<b>for fruits (include nuts)</b>	<b>for vegetables (include mushrooms, popcorn)</b>	<b>for small grains and hops</b>
<b>Acres</b>	_____	_____	_____	_____

3. What other agricultural products do you raise for income? *(please check all that apply)*

☐ dairy      ☐ livestock      ☐ poultry/eggs      ☐ field crops

☐ other, please list \_\_\_\_\_

4. In what counties do you farm fruits, vegetables, hops, or small grains?

5. Approximately how much were your fruits, vegetables, hops, and small grains sales receipts in 2011? *(please check one)*

<input type="checkbox"/> Less than \$10,000	<input type="checkbox"/> \$100,000-\$249,999
<input type="checkbox"/> \$10,000-\$24,999	<input type="checkbox"/> \$250,000-\$499,999
<input type="checkbox"/> \$25,000-\$49,999	<input type="checkbox"/> \$500,000-\$1,000,000
<input type="checkbox"/> \$50,000-\$99,999	<input type="checkbox"/> over \$1,000,000

## II. Produce Enterprise

6. Please list your top 10 fruit, vegetable, hops, or small grains crops ranked by 2011 sales. Please also list your average yearly production (lbs.), and, in general, what portion of each crop is for the fresh market.

**Example:**

Sales Rank	Crops	Average annual production	% of sales for fresh market
1	apples	2,940,000 lbs.	70%
2	snap beans	620,000 lbs.	0%

**Your farm:**

Sales Rank	Crops	Average annual production	% of sales for fresh market
1		lbs.	
2		lbs.	
3		lbs.	
4		lbs.	
5		lbs.	
6		lbs.	
7		lbs.	
8		lbs.	
9		lbs.	
10		lbs.	

7. Please estimate the percent of the sales of each of your top 5 crops in 2011 to each of the following customer types.

Percent of Sales of Top 5 Crops					
Customer Type	Crop 1	Crop 2	Crop 3	Crop 4	Crop 5
Packer-Shipper					
Wholesaler/Distributor					
Retailer					
Foodservice					
Direct to consumers*					
Processor/Manufacturer					
Other					
Total	100%	100%	100%	100%	100%

\*If you sell direct to consumers, please indicate what portion of your direct sales are from each outlet:

Farmers market					
CSA					
Farm store/stand					
Other					
Total	100%	100%	100%	100%	100%



8. What percent of your crops do you sell to customers who are located within the 9-county study region of Genesee, Livingston, Monroe, Ontario, Orleans, Steuben, Wayne, Wyoming, and Yates counties.

	Top 5 Crops				
	Crop 1	Crop 2	Crop 3	Crop 4	Crop 5
% sold within the 9-counties	_____	_____	_____	_____	_____

9. Approximately, what percent of your fruits, vegetables, hops, and small grains production is organic? \_\_\_\_\_%

Do you think this will: ☐ decrease ☐ stay the same ☐ increase ☐ don't know

### III. Future Plans for Produce Enterprise

10. If you have plans to increase or decrease production of specific crops by 2015, please complete the table below indicating the changes you plan to make to your production.

\_\_\_\_ ***Please check here if you do not plan to increase or decrease production, and SKIP to Question 13 on page 4.***

Crop	Increase or decrease in production
_____	_____ %
_____	_____ %
_____	_____ %
_____	_____ %
_____	_____ %
_____	_____ %
_____	_____ %
_____	_____ %

Please describe why \_\_\_\_\_

11. If you have plans to increase any fruit, vegetable, hops, or small grains production, which of the following do you plan to do? (*please check all that apply*)

<input type="checkbox"/> Use acreage from other crops/enterprises	<input type="checkbox"/> Increase sales to current customers
<input type="checkbox"/> Invest in additional acres	<input type="checkbox"/> Add new customers
<input type="checkbox"/> Increase productivity of current land	<input type="checkbox"/> Add new marketing enterprise
<input type="checkbox"/> Invest in buildings or equipment	<input type="checkbox"/> (e.g. direct marketing, foodservice)
<input type="checkbox"/> Hire additional employees	<input type="checkbox"/> Other, _____

12. If you have plans to decrease any fruit, vegetable, hops, or small grains production, which of the following do you plan to do? (*please check all that apply*)

<input type="checkbox"/> Use acreage for other crops/enterprises	<input type="checkbox"/> Retire or exit farming
<input type="checkbox"/> Divest acreage	<input type="checkbox"/> Other, _____

#### IV. Barriers to Growth

13. We are interested in hearing the greatest challenges affecting your produce enterprise. Please check the 5 most important challenges listed below, or list your own. Please also describe how each of the 5 impacts your business.

Challenges:	5 Most Important	Describe impact
Farm Resources		
availability of labor	<input type="checkbox"/>	_____
availability of management	<input type="checkbox"/>	_____
availability of land	<input type="checkbox"/>	_____
profitability	<input type="checkbox"/>	_____
Markets		
finding new customers	<input type="checkbox"/>	_____
risky market conditions	<input type="checkbox"/>	_____
customer requests	<input type="checkbox"/>	_____
changing consumption trends	<input type="checkbox"/>	_____
Business Environment		
labor regulations	<input type="checkbox"/>	_____
access to capital	<input type="checkbox"/>	_____
land use regulations	<input type="checkbox"/>	_____
environmental regulations	<input type="checkbox"/>	_____
wage rates	<input type="checkbox"/>	_____
fuel cost	<input type="checkbox"/>	_____
Technology and Infrastructure		
postharvest technology	<input type="checkbox"/>	_____
harvest technology	<input type="checkbox"/>	_____
plant varieties	<input type="checkbox"/>	_____
transportation/trucking infrastructure	<input type="checkbox"/>	_____
local ag infrastructure ( <i>suppliers, equipment dealers, technology, etc.</i> )	<input type="checkbox"/>	_____
sustainable agriculture production assistance	<input type="checkbox"/>	_____
effective farm organizations or associations	<input type="checkbox"/>	_____
Other, _____	<input type="checkbox"/>	_____

**Thank you for your time!**

**Please mail us your completed survey in the business reply envelope provided.**

**You may also fax the survey to: (607) 255-4776**

We will be compiling the information quickly and holding a focus group to discuss and extend the results. Please let us know if you would be interested in participating in a focus group, and we can send details as they develop. If you would like a copy of the final report, please give us your contact information below.

☐ I am interested in learning more about the focus group you will be holding.

Name \_\_\_\_\_ Farm Name \_\_\_\_\_

Address \_\_\_\_\_

Email \_\_\_\_\_ Phone \_\_\_\_\_