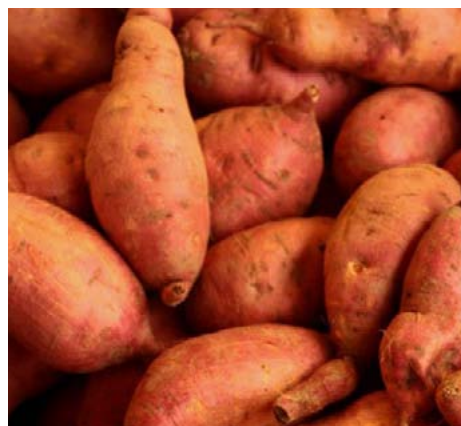




Organic Produce Marketing Survey

2013



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Attributions

Smithson Mills, Inc. was the contracted research organization for primary data gathering and report development.

Taylor Sisk was the lead copy editor and a data researcher.

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Roland McReynolds, CFSA Executive Director, served as managing editor.

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Executive Summary

In the spring of 2011, the Carolina Farm Stewardship Association (CFSA) initiated an Organic Produce Market Survey (OPMS) to enhance the competitiveness of specialty-crop producers in North Carolina in the growing market for organic fruits and vegetables.

The organic industry in North Carolina is expanding. Local businesses, such as Eastern Carolina Organics, are experiencing significant growth. Locally-based, regional companies, such as Harris Teeter and Lowes Foods, are expanding their organic offerings. National companies, such as Albert's Organics and Amy's Kitchen, are establishing new regional facilities.

North Carolina's farmers, however, continue to face challenges in seizing a greater share of the state's organic market. The exact scope and market potential for Carolina-grown organic produce is unknown, and this lack of information limits the ability of the state's growers and food producers to attract financing, take advantage of government cost-share programs, and develop realistic business and expansion plans.

This survey was designed to address this problem by: (1) conducting market research with retailers and food manufacturers to quantify the demand in North and South Carolina for organic produce that could be met by local producers; (2) comparing that demand with data on the production of organic crops from the U.S. Department of Agriculture and other sources to document the strongest opportunities for growth in organic produce production in the region.

Researchers elected to survey 13 organic items:

Broccoli	Irish Potatoes (red, white and yellow)
Sweet Potatoes	Tomatoes
Strawberries	Summer Squash
Bell Peppers (all colors)	Watermelons
Cucumbers	Sweet Corn
Leaf Lettuce (all, not iceberg)	Cabbage (all)
Spinach	

These items were selected by CFSA staff and researchers because they can be grown commercially in the Carolinas using certified-organic methods. In addition, it was believed that there may be a measurable market demand for each of these crops that is in excess of the amount currently grown in the two states.

The results of this survey show that, in fact, there is a considerable gap in between the regional demand for organic products and what North Carolina's growers are currently supplying. The data indicates that of the 13 products researched; currently, only the demand for sweet potatoes is being met by local growers.

The chart below shows: (1) the demand for these organic items during the months in which they can be grown in the Carolinas or kept in cold storage for extended periods (as is the case with potatoes and cabbage); (2) the most recent available production numbers for these items in North Carolina; (3) the gap between demand and supply in pounds, and (4) the gap per week of the growing season for each. Given that spinach can be easily and inexpensively frozen in bulk, researchers assumed that growers could meet the entire demand for processed spinach; the numbers have been calculated accordingly.

Produce Item	Carolina Demand	Carolina Supply	Gap	Gap per week of growing season
Broccoli	1,412,783 lbs	83,100 lbs	1,329,683 lbs	25,570 lbs
Tomatoes	1,914,462 lbs	767,100 lbs	1,147,362 lbs	29,098 lbs
Irish Potatoes	1,049,281 lbs	94,700 lbs	954,581 lbs	21,979 lbs
Leaf Lettuce	688,344 lbs	58,200 lbs	630,144 lbs	14,556 lbs
Summer Squash	472,085 lbs	89,920 lbs	382,165 lbs	17,482 lbs
Cabbage	1,109,895 lbs	274,800 lbs	835,095 lbs	27,570 lbs
Sweet Corn	337,862 lbs	11,200 lbs	326,662 lbs	37,504 lbs
Spinach	548,978 lbs	2,000 lbs	546,978 lbs	21,391 lbs
Watermelon	262,160 lbs	32,700 lbs	229,460 lbs	17,463 lbs
Strawberries	182,229 lbs	33,900 lbs	148,329 lbs	11,410 lbs
Cucumbers	174,030 lbs	46,380 lbs	127,650 lbs	7,324 lbs
Bell Peppers	246,213lbs	156,400 lbs	89,813 lbs	4,109 lbs

To put this in perspective, for North Carolina farmers to displace imported organic produce and meet the demand for these organic items would require a more than 400 percent increase in organic fruit and vegetable production in the state.

Using an estimated average price paid to organic growers during the height of each item's growing season, the dollar value of this gap is as follows:

Produce Item	Value of gap
Broccoli	\$2,089,500
Tomatoes	\$1,577,620
Irish Potatoes	\$801,850
Leaf Lettuce	\$712,062
Spinach	\$531,972
Cabbage	\$437,000
Summer Squash	\$382,165
Strawberries	\$296,660
Sweet Corn	\$171,500
Cucumbers	\$153,180
Bell Peppers	\$107,775
Watermelon	\$54,180
Total	\$7,315,464

Introduction and Market Research Methodology

In April 2012, the Carolina Farm Stewardship Association (CFSA) contracted with Smithson Mills Inc. to conduct research on sales of a select group of organic produce items in North Carolina and South Carolina. The primary purpose of the market research was to measure the volume of organic produce items being sold in the two states through wholesalers, retailers and value-added processors. In consultation with CFSA staff, the researchers developed written survey instruments to ascertain demand for the 13 organic produce items selected for study.

The survey instruments included questions for wholesalers, retailers and processors regarding terms for market access (such as liability insurance and GAP certification) and whether or not they have experienced increases in demand for organic products in the past three years. The surveys also asked these buyers open-ended questions about rising demand for specific items and advice and guidance for growers wishing to develop sales relationships. The survey instruments used are included in the appendices of this report.

The supermarket industry is highly competitive, and competitors routinely conduct market research on each other. Researchers were concerned that many produce executives would refuse to answer questions regarding the price and volume of the specific organic produce they use. In order to secure participation from market makers, respondents were assured that individual survey responses would not be reported or disseminated. Furthermore, no questions were asked regarding price points for organic items moving through businesses at farm gate, wholesale or retail levels.

Most corporate produce managers were willing to answer the survey on a confidential basis and reported volumes of specific produce items used in their operations on a quarterly basis. This was especially true for executives who knew about CFSA and its mission to support organic producers in the Carolinas. In all, produce managers and executives in charge of more than 330 retail stores in North and South Carolina completed all questions in the retail survey.

However, some retailers, citing confidentiality and market competitiveness, refused to answer questions regarding produce volumes; they only answered the open-ended questions in the survey. In other instances, retail executives refused to participate in the survey in any way.

In order to develop an accurate estimate of amounts of specific organic produce items being sold through these retailers, the researchers conducted in-store investigations to observe organic produce at the retail point-of-sale. Researchers compared and contrasted in-store data collected at 16 different stores with survey data gathered from other retailers. Reviews of corporate annual reports, identification of store locations based on zip code, and an analysis of median household income in those zip codes all contributed to extrapolated estimates for

company-wide movement of organic produce. In all, volume movements for specific items at approximately 170 retail locations were estimated using this methodology.

In aggregating volumes reported by both wholesalers and retailers, there was a risk that certain volumes would be counted twice. To circumvent this possibility, wholesalers were asked to report the percentage of their sales for each produce item to supermarkets, restaurants and other markets. The percentage of their sales reported for supermarkets was subtracted from their reported amounts when aggregating sales volumes.

Market research was conducted from May 15 to September 26, 2012. Volumes of produce reported in this document represent aggregates from approximately 500 retail points of sale, wholesale distribution to more than 150 restaurants and usage by three value-added food processors.

The researchers do not suppose that the entire universe of organic produce market makers is measured in this report; not every retail store, wholesaler or value-added processor using organic produce in the Carolinas was measured. In fact, given the prevalence of organic produce in the marketplace today, we are confident that a significant portion of the overall organic market was left unmeasured. However, we do believe that the amounts reported are accurate measurements of organic produce volumes used in the market channels that are most accessible to organic produce growers in the Carolinas, with the exception of direct marketing channels such as farmers' markets, community supported agriculture, online sales, etc...

Market Channels for Organic Produce in the Carolinas

Organic produce in the Carolinas is sold through a variety of channels, including direct-market sales from growers to consumers, sales through restaurants, retail sales through produce sections of grocery stores and sales of value-added organic foods through frozen-food cases, specialty-food aisles or general grocery sections of retailers.

For purposes of this research, three main types of organic produce marketing were investigated in the Carolinas: 1) Sales of fresh organic produce by wholesalers to restaurants and end-users; 2) purchases of fresh organic produce by retail food stores, and 3) purchases of produce for value-added processing. A brief description of these markets is provided below.

Produce Wholesalers

Produce wholesalers are intermediary organizations that sell and distribute produce to a variety of end users, including retail stores and restaurants. These organizations may be part of larger regional or national companies or they may be homegrown small businesses with experience dealing with local growers. Farmer- or community-owned aggregators also provide niche marketing services for a select group of farmers. Some examples of organic produce wholesalers include Albert's Organics, Mountain Foods and Eastern Carolina Organics.

Albert's Organics

Albert's Organics was established in 1982, during a time when organics and locally grown produce were just starting to become popular in trend-setting regions such as California. Over the years, Albert's has grown into one of the leading distributors of certified-organic produce, with distribution coverage across the majority of the U.S. and most locations in Canada.

Because of its extensive network, Albert's Organics is capable of serving every major metropolitan market in the U.S, operating seven distribution centers in California, Colorado, Florida, New Hampshire, Minnesota, North Carolina and New Jersey. Albert's Organics regularly carries more than 300 seasonal fruits and vegetables and provides product to more than 5,000 natural-food stores, supermarkets and restaurants across America. The organization carries 600 SKU's of organic items and the procurement division supports distribution of more than 130,000 boxes per week. SKU stands for stock keeping unit, which is the level on which items are tracked by a computerized point-of-sale system. For instance, if a retailer wanted to track the sales of three different colors of peppers, they would use three different SKU's to do so.

Albert's Organics' parent company is United Natural Foods Inc.

Eastern Carolina Organics

Begun in 2004 as a project of the Carolina Farm Stewardship Association (CFSA), Eastern Carolina Organics (ECO) markets and distributes wholesale organic farm produce to retailers, restaurants, and buying clubs. ECO supports emerging organic farmers and organic tobacco farmers while improving the supply of local organic produce.

In 2005, ECO became a private, grower- and manager-owned LLC with 13 grower and two staff owners. Today ECO works with more than 40 growers and 100 customers. As a mostly farmer-owned business, 80 percent of its revenues go directly to the growers. ECO also works closely with growers to coordinate grow-out with market demand and farm resources to help create a year-round supply of fresh local produce. The company's CEO is Sandi Kronick.

Mountain Food Products

In 1985, Swannanoa farmer, Ron Ainspan, recognized that there was a need for consolidated produce distribution in Asheville, so Mountain Food Products was born with the goal of distributing locally produced foods to local businesses. The business' local focus and smaller size ensures that Mountain Food Products provides individualized service to its customers, many of which are small, independent restaurants in and around Asheville.

Mountain Food Products is located at the Western North Carolina Farmers' Market in Asheville. The company offers a full selection of fresh fruits, vegetables, and specialty products, including organics and a multi-farm community-supported agriculture program with several pick-up locations across Asheville.

Retail Food Stores

Researchers believe that up until a few years ago, the vast majority of certified-organic produce in the Carolinas was sold through high-end natural-foods stores. A 1999 research report, *An Overview of the North Carolina Organic Industry* (Estes, Kleese, et al.), identified 27 retail grocery stores in North Carolina carrying a substantial amount of organic produce. In comparison, research for this current report identified approximately 500 retail stores vending organics.

As organics have spread into the mainstream, especially in areas with higher disposable incomes, traditional supermarkets have expanded their organic selections and introduced system-wide branding and point-of-sale marketing that focuses on organics as a premium selection in the produce aisle. Despite the growth of organic selections in all supermarkets, researchers believe that the majority of organics are sold in urban markets of the Carolinas.

Researchers reviewed stores with organic sales in North and South Carolina, with a greater concentration on urban markets with higher per-capita incomes. Some identified examples of organic market movers include Whole Foods Markets, Weaver Street Market, Earth Fare, Harris Teeter, The Fresh Market, Ingles Markets, Lowes Foods, BI-LO, and Publix Super Markets.

Whole Foods Market

Whole Foods Markets was established in Austin, Texas in 1980 and has since grown to become the largest natural-foods retailer in the U.S. It has a major influence on production practices and standards for natural-foods producers.

Whole Foods stores are generally located within major urban markets with high average incomes and educational levels. Its North Carolina stores are in Asheville, Cary, Chapel Hill, Durham, Greensboro, Raleigh (two stores), Wilmington and Winston-Salem. Its South Carolina stores are in Charleston, Columbia and Greenville. Management and purchasing decisions are divided regionally, with N.C. and S.C. stores led by the Southeastern headquarters in Atlanta.

Weaver Street Market

Weaver Street Market is a worker- and consumer-owned cooperative selling natural and organic food with a focus on local and fair-trade products. Opened in Carrboro, North Carolina in 1988, the cooperative was an early supporter of local, sustainable, and organic agriculture in the Carolinas.

In addition to sourcing organic produce from large wholesalers, Weaver Street sources directly from organic farms and farmer-controlled vendors such as Eastern Carolina Organics. The cooperative's flagship store remains in Carrboro, and it has expanded to include stores in Chapel Hill and Hillsborough, NC. Weaver Street also owns a restaurant, Panzanella, in Carrboro. All market profits are returned to owners or used to strengthen the cooperative.

Earth Fare

Earth Fare was founded as a single organic and natural-foods store in Asheville in 1975, and maintains its corporate office there. Today Earth Fare is one of the largest natural-food retailers in the southeastern and central U.S., with 28 stores in eight states.

Earth Fare stores offer ready-to-go meal options, local and organic farm-fresh fruits and vegetables and full-service meat, poultry and seafood departments. According to its website, Earth Fare does not carry products containing high-fructose corn syrup, artificial trans-fats, artificial colors and sweeteners or synthetic growth hormones in meat and milk.

Earth Fare has nine stores in North Carolina and four in South Carolina. Its stores are generally concentrated in major urban markets in areas with higher average incomes and educational

levels. Its North Carolina stores are in Asheville, Boone, Charlotte, Greensboro, Huntersville and Raleigh. Its South Carolina stores are in Charleston, Columbia, Greenville and Rock Hill.

Harris Teeter

Harris Teeter is based in Matthews, North Carolina. It is the dominant upscale supermarket chain in that state, with a commanding presence in the Piedmont and greater Charlotte region. In recent years, the company has embraced the concept of “green” business practices, pledging to provide shoppers with the highest level of customer service while implementing sound environmental practices in its stores, corporate office and community.

Harris Teeter has moved firmly into the organic and natural-foods retail category, with a uniform organic branding system and upgraded produce aisles that compete with more established natural-foods retailers. Every Harris Teeter stores now carries organic produce, although quantities vary greatly depending upon local demographic conditions.

Harris Teeter has 136 stores in North Carolina and 13 in South Carolina. Stores are located in 50 North Carolina municipalities. In South Carolina, Harris Teeter operates stores in Charleston, Florence, Fort Mill, Hilton Head, Mount Pleasant and Rock Hill.

BI-LO

BI-LO is a supermarket chain headquartered in Jacksonville, Florida. In 2012, the company operated 207 supermarkets under the BI-LO brand in South Carolina, North Carolina, Georgia and Tennessee, and 485 stores under the Winn-Dixie brand in Florida, Alabama, Louisiana, Georgia and Mississippi. *Supermarket News* ranked BI-LO No. 34 in the 2007 “Top 75 North American Food Retailers” based on 2006 fiscal-year estimated sales of \$3.6 billion.

As a mid-tier retailer, it does not promote high-end organics to the same degree as natural-foods stores, but carries some organic produce in all of its stores.

The Fresh Market

The Fresh Market was founded in 1982 in Greensboro, North Carolina. Its stores’ have a smaller footprint than mainstream grocery chains, with a heavy focus on personal service and perishable goods. Still operated and based out of North Carolina, The Fresh Market has grown in size from one store in Greensboro to 115 stores in 21 states. The Fresh Market offers more than 400 produce items, including a growing organic selection.

In some stores, organically certified produce takes up more than 25 percent of retail aisle space. The Fresh Markets’ produce sections are a major portion of overall store sales. As a high-end specialty retailer, The Fresh Market tends to be in more direct competition with natural-foods stores than with mainstream grocery chains.

Ingles Markets

Based in Black Mountain, North Carolina, Ingles has a large presence in the Carolinas, with 69 stores in North Carolina and 36 stores in South Carolina. Ingles self-distributes 64 percent of its stores' merchandise from its distribution center on the outskirts of Asheville, North Carolina. Almost all of their stores are located within a 250-mile radius of their distribution center.

Traditionally a low-cost retailer selling to blue-collar communities, Ingles' urban stores have in recent years been transformed into upscale shopping venues with a wide selection of specialty foods, organic produce and locally sourced products. While stores in smaller towns and lower-income communities do not have a strong organic presence, flagship stores in Asheville and other urban markets have a look and feel comparable to that of Harris Teeter stores in the Piedmont.

Lowes Foods

Based in Winston-Salem, Lowes Foods operates 98 stores in North Carolina and four in South Carolina. Lowes also operates the "Locally Grown Club," which is essentially a CSA-style food program operated out of the grocery location. With this program, customers are able to place an order to receive a box of produce every week. Each box contains six to 10 unique produce items and weighs no less than 12 ½ pounds.

In recent years, Lowes Foods has increased its organic produce offerings and has established unified point-of-sale branding materials for organic sections of the produce aisles. The company is a participant in the North Carolina 10 Percent Campaign, pledging to source at least 10 percent of its purchases from within the state. According to its website, Lowes Foods already exceeds the 10 percent locally grown goal for fresh fruits and vegetables in their North Carolina stores during the state's growing season.

Publix

Founded in 1930, Publix Super Markets is the largest employee-owned supermarket chain in the U.S. Publix has operations in Alabama, Florida, Georgia, South Carolina and Tennessee. It employs more than 140,000 people at its 1,056 retail locations, cooking schools, corporate offices, eight grocery distribution centers and nine Publix-brand manufacturing facilities.

Publix has 45 stores in mostly urban markets and towns in South Carolina. It does not currently have any stores in North Carolina, although in September 2012 the company announced its intention to begin opening stores in the Charlotte market and to look at expansion into other parts of the state.

While Publix has experimented with competing in the natural-foods category via its GreenWise Markets in Florida, in South Carolina, the chain competes more aggressively as a mid- to upper-tier retailer with good prices and large selections. Company press releases on its entry into the

Charlotte market indicate that Publix intends to compete more directly with Harris Teeter stores than with stores catering more toward value shoppers.

Value Added Organic Produce Users

Researchers believe that a growing sales channel for organic produce is in value-added processing. Companies engaged in processing organic produce may be manufacturing branded shelf-stable retail items or they may be intermediate processors providing ingredients to other food processors, such as baby food manufacturers.

The market for produce used in processing can vary greatly from the fresh-produce market in terms of visual quality, supply chains and price structures. While some produce crops can be grown exclusively for further processing needs, many types of produce are grown for both markets, with first-grade produce sold for fresh retail consumption and lower-grade produce from the same harvest sold to a processor at lower prices.

Often, intermediary processing is required before a final processor will purchase certain items; this is a major impediment to accessing markets for processing. Intermediary processing may include blanching, slicing, individual quick freezing (IQF), canning, pureeing or bulk packaging of raw produce items in preparation for use in shelf-stable retail foods. High capital costs for building IQF and canning facilities, and the fact that the southeast lags other parts of the country in such infrastructure, may preclude growers from accessing these markets.

One example of a value-added organic processor is Amy's Kitchen.

Amy's Kitchen

Amy's Kitchen is a privately held corporation that began operation in 1987, with the purpose of making healthy, organic and easy-to-prepare frozen food. The company employs more than 1,600 people and operates processing plants located in Santa Rosa, California and White City, Oregon. A new processing facility is planned for location in the Carolinas.

Amy's Kitchen is a national value-adding producer that utilizes organic produce for its products. Items produced include canned soups, beans and chili, jarred pasta sauces, salsas and frozen meals, including pizzas, pocket sandwiches, potpies, entrées, snacks and whole meals. Nearly all U.S. mainstream supermarkets carry Amy's soups, sauces and/or frozen food, including Whole Foods, Costco, Wal-Mart, Publix, Target, Ingles and many others. Similarly, most local natural-food stores also offer a good selection of Amy's.

Since they manufacture food year-round, Amy's requires produce sourced in shelf-stable packaging, most often canned or frozen products. This is a necessity for most large-scale branded value-added processors and is illustrative of the need for value-added production even before the final value-adding processor receives the product for use.

Market Research Results

Measured volume movement for each targeted organic produce type is presented below, along with discussions of observations made in the course of data gathering. Produce items are presented in order of greatest measured fresh-market demand in terms of volume.

Sweet Potatoes

Sweet Potatoes (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	368,674	334,890	412,908	423,472	1,539,944
Total, Processed Only	760	0	750,000	751,200	1,501,960
Totals	369,434	334,890	1,162,908	1,174,672	3,041,904

North Carolina is the nation's largest sweet potato producer, and it is not surprising that a large volume of organic sweet potatoes was found in the marketplace. Measured fresh use of organic sweet potatoes totaled 1,539,944 pounds. Organic sweet potato volumes were found to be strong in natural foods stores and among traditional supermarket retailers. However, a large percentage of these products were found to be from California rather than home grown. Shipped in 40-pound cases, the measured annual volume of organic sweet potatoes equals about 38,499 cases.

The Carolinas are home to at least two further processors of organic sweet potatoes. Processors reported an estimate of 1,501,960 pounds of organic sweet potatoes used in value-added processing, with the vast majority of that processed as an ingredient for the baby food industry.

Strawberries

Strawberries (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	176,218	437,100	364,801	339,478	1,317,597
Total, Processed Only	6,011	5,891	5,891	6,131	23,924
Totals	182,229	442,991	370,692	345,609	1,341,521

Perhaps no other item in the produce aisle has been more commoditized than strawberries, and organic strawberries are no exception. Organic strawberries, along with washed loose salad greens packed in clamshells, are probably the most widely distributed organic produce items and can be found, year-round, in mainstream retail stores - even in sparsely populated areas.

Researchers believe that the measured amount of organic strawberries is far less than actual quantities used in the Carolinas.

Researchers measured sales of organic strawberries in almost every retail location, packed in plastic clamshell boxes and weighing one pound each. All strawberries observed in stores during the research period for this report (the fall of 2012) were of California origin, although in May and June locally grown organic strawberries are available in some North Carolina markets. Strawberries are shipped in cases of 12 units each. The measured fresh volume of 1,317,597 pounds is equal to about 109,800 cases.

The measured processing demand of 23,924 pounds would be shipped from an intermediate processor in the form of puree.

Broccoli

Broccoli (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	301,064	271,573	305,640	292,543	1,170,819
Total, Processed Only	60,616	60,316	60,316	60,716	241,964
Totals	361,680	331,889	365,956	353,259	1,412,783

Researchers observed that fresh broccoli is one of the largest organic movers in terms of volume by weight in many stores. Large organic displays of more than 50 broccoli stalks are not uncommon in urban supermarkets where consumers with high disposable incomes live. The total measured amount of organic broccoli used in the Carolinas is 1,412,783 pounds, of which 1,170,819 pounds were measured from fresh-produce retailers and distributors and 241,964 pounds were measured from processors.

Conversations with produce managers and executives indicated that the majority of organic broccoli sold at retail markets in the Carolinas originates in California. Organic broccoli is usually shipped in 14-unit cases weighing approximately 20 pounds. The annual measured usage of fresh organic broccoli equals about 58,541 standard cases.

Organic broccoli used for processing is believed to be supplied in IQF form. Like fresh organic broccoli, the majority of IQF broccoli is sourced from the West Coast.

Cabbage

Cabbage: all (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	276,148	280,008	281,681	270,705	1,108,542
Total, Processed Only	597	147	147	462	1,353
Totals	276,745	280,155	281,828	271,167	1,109,895

In terms of weight, fresh organic cabbage is among the highest-volume organic produce items found in the marketplace. Annual usage of 1,108,542 pounds was measured, equaling approximately 24,634 45-pound cases. Some volume of organic cabbage was found in every retail organization measured.

Processors reported usage of only 1,353 pounds of organic cabbage annually. This is believed to be sourced fresh, but may be shredded before shipment to the processor.

Summer Squash

Summer Squash (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	233,166	260,543	218,115	212,865	924,689
Total, Processed Only	37,229	36,529	36,529	37,229	147,516
Totals	270,395	297,072	254,644	250,094	1,072,205

Fresh organic summer squash and zucchini were found to be popular in all markets where they are available. Summer squash is a recognized regional Southern favorite, while zucchini is familiar to transplants and natives alike. Measured fresh usage is 924,689 pounds, or about 46,235 20-pound cases.

Processors reported usage of 147,516 pounds, all delivered in bulk, sliced, in IQF packaging.

Irish Potatoes

Irish Potatoes: red, white & yellow (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	229,233	222,858	224,418	212,240	888,749
Total, Processed Only	40,753	39,553	39,553	40,673	160,532
Totals	269,986	262,411	263,971	252,913	1,049,281

The total measured amount of organic Irish potatoes (red, white and yellow varieties) used in the Carolinas is 1,049,281 pounds, of which 888,749 pounds were measured from fresh-produce retailers and distributors and 160,532 pounds were measured from processors.

Organic potatoes were found less consistently than some other measured organic items at the retail level. At least two retail chains and one wholesale distributor did not carry any organic potatoes, despite having otherwise well-developed organic produce sections.

Organic Irish potatoes are usually shipped in 40-pound cases. The annual measured usage of fresh organic Irish potatoes equals about 22,219 cases.

Tomatoes

Tomatoes (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	149,575	166,918	139,408	137,536	593,437
Total, Processed Only	490,609	489,799	489,799	490,519	1,960,726
Totals	640,184	656,717	629,207	628,055	2,554,163

The total measured amount of fresh organic tomatoes used in the Carolinas is 593,437 pounds, or about 32,969 18-pound cases. Discussions with market managers indicated that a preference for fresh, locally grown tomatoes substantially decreases demand for non-local organic types in the summer. It should be noted that the survey instrument used did not specify whether tomatoes were slicing varieties, plum varieties (such as romas) or cherry tomatoes for salad garnishes. However, we believe the vast majority of fresh tomatoes reported were of the slicing variety.

Demand for tomatoes by processors, at 1,960,726 pounds, dwarfs the volumes measured for fresh consumption. However, it must be noted that these are purchased by the processor already chopped, cooked or canned.

Cucumbers

Cucumbers (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	100,563	140,409	100,270	95,880	437,122
Total, Processed Only	300	0	0	200	500
Totals	100,863	140,409	100,270	96,080	437,622

Cucumbers are a produce staple, and organic cucumbers are found in natural-food stores and traditional grocery chains alike. A total of 437,122 pounds of fresh organic cucumbers were

measured in the market, equal to about 21,856 20-pound cases. One large grocery chain consistently sources locally grown organic cucumbers; as a result, there was a 40 percent spike in the volume of organic cucumber sales during the local growing season as compared to the off-season months.

Processors reported using only 500 pounds of organic cucumbers, but it should be kept in mind that only North and South Carolina-based processors were surveyed. Like squash and peppers, these are sourced in bulk packaging, sliced and IQF.

Bell Peppers

Bell Peppers: all colors (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	80,019	82,592	79,314	77,622	319,547
Total, Processed Only	66,306	66,306	66,306	66,306	265,224
Totals	146,325	148,898	145,620	143,928	584,771

Organic bell peppers colored green, red and yellow were found in most stores carrying a wide selection of organic produce. Market managers reported lower volumes of red and yellow bell peppers due to their high cost, among the most expensive organic items on a per-pound basis. Annual fresh usage was measured at 319,547 pounds, or about 31,955 10-pound cases.

Demand for peppers for processing, delivered in bulk, sliced and IQF, was measured at 265,224 pounds.

Spinach

Bunch Spinach (pounds)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	15,392	18,298	12,199	12,061	57,950
Total, Processed Only	122,757	122,757	122,757	122,757	491,028
Totals	138,149	141,055	134,956	134,818	548,978

Organic bunch spinach is facing strong competition from washed loose salad greens sold in plastic clamshell boxes. Organic spinach is believed to be among the biggest sellers of Earthbound Farm's 5-ounce clamshell items and can be found in almost every retail grocery store.

Measuring total retail demand for bunch spinach proved difficult for a couple of reasons. First, organic bunch spinach is seasonal and there was very little observed in the marketplace during late-summer in-store research. Secondly, some survey respondents are believed to have

reported clamshell packages instead of bunch spinach. The measured volume of 57,950 pounds of bunch spinach is considered conservative, and usage during late-spring and early-summer months is believed to be higher than measured amounts. The measured volume equals about 2,415 24-count cases.

One processor reported extraordinarily large volume demand for frozen spinach, with an estimated annual demand for 491,028 pounds. Unlike hard vegetables, spinach can be frozen in bulk, not IQF, and is thus cheaper to process than items such as frozen broccoli or peppers.

Watermelons

Watermelons (pieces)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	9,979	19,492	12,000	8,000	49,471
Total, Processed Only	0	0	0	0	0
Totals	9,979	19,492	12,000	8,000	49,471

Survey respondents reported use of 49,471 organic watermelons annually. Interviews with market managers revealed that the supply for organic watermelons does not meet demand, and most stores do not carry them due to supply-chain restraints. Several produce executives reported that organic melons are among the most difficult items to source consistently. This is one of the few organic produce items that are not consistently sourced from large California producers. Researchers believe that most organic watermelons sold at retail in the Carolinas during the summer originate in Georgia, and are thought to be small round melons weighing in the 10-pound range. This regional source results in a near doubling of demand during the summer.

No processors reported using watermelons.

Leaf Lettuce

Leaf Lettuce (all, not iceberg) (24-count boxes)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	7,936	8,096	7,607	7,186	30,826
Total, Processed Only	0	0	0	0	0
Totals	7,936	8,096	7,607	7,186	30,826

Researchers measured 30,826 24-count cases of fresh leaf lettuce of all varieties, excluding iceberg lettuce. Due to wide variations in case weight by specific variety, volumes are reported

in cases. Demand and usage was fairly consistent throughout the year, with most product sourced from California.

Researchers believe that consumer demand for leaf lettuce sold in heads has been supplanted by washed loose salad greens sold in 5-ounce clamshell packages, most notably those coming from Earthbound Farms in California. As one produce executive noted, “If you put it in a clamshell, I can sell it all day.” This phenomenon, also common with strawberries, has resulted in organic leaf lettuce in clamshells being observed in almost all markets regardless of geographical location or proximity to high-income consumers.

No processors reported using leaf lettuce.

Sweet Corn

Sweet Corn (48-count boxes for fresh, pounds for processed)					
	Spring	Summer	Fall	Winter	All Year
Total, Fresh Only	1,974	21,563	200	167	23,904
Total, Processed Only	36,053	36,053	36,053	36,053	144,213
Totals (in pounds)	115,013	898,573	44,053	42,733	1,100,372

Retailers and wholesalers reported using 23,904 48-count cases of fresh sweet corn, almost all during summer months. Sweet corn, along with watermelons, is among the hardest-to-source organic produce items. Produce managers cited short shelf life and the difficulty in growing organic sweet corn as primary reasons they rarely carry this item. While seven retail organizations reported carrying at least some organic sweet corn in summer months, only one retailer reported carrying it in all four seasons.

One processor reported using 144,213 pounds of organic frozen corn annually. This is assumed to be either canned or IQF product.

Additional Market Information

Survey respondents were also asked questions about general market conditions for organic produce that were thought to be useful to prospective suppliers.

Market managers were asked, “In the past three years, have you experienced an increase or decrease in demand for certified-organic produce?” Of 14 total respondents, 13 reported an increase.

Retailers were asked, “Are you currently capable of meeting your identified demand for certified organic produce?” Half of all retailers reported not being able to meet demand for at least some organic items.

Retailers were then asked what specific organic produce items have the most growth potential in coming years. The table below shows the top 10 responses:

Item	Frequency
1. Berries	6
2. Melons/ Watermelons	5
3. Carrots	3
4. Sweet Corn	3
5. Peppers	3
6. Potatoes	2
7. Strawberries	2
8. Tomatoes	2
9. Spring Mix	2
10. Celery	2

From this information, it is clear that growth potential is expected for sweeter fruits and vegetables, including strawberries, melons, carrots and sweet corn. A rising national trend toward spicy foods (and a growth in Latino populations) may be the impetus for expected demand increases for peppers. In all, 10 of the 13 produce items measured in the survey were mentioned as having growth potential.

Produce executives were also asked about specific requirements, in addition to organic certification, needed for anyone hoping to supply organic produce to their organizations. A total of 16 respondents replied. The following chart shows requirements that respondents listed as important:

Requirements for Selling Organic Produce	
Requirement	# of Respondents
Liability Insurance	8
GAP Certification (In Progress)	3
GAP Certification (Complete)	5
Hazard Analysis and Critical Control Points (HACCP) Plan	3
Post-Harvest Cold Chain	5
Product Traceability/Lot #	9
Email Communication	5

Nine of 16 respondents reported that suppliers must have a product-traceability mechanism in place. Of all listed requirements, this was the most common.

Eight of 16 respondents listed liability insurance as a requirement, with stated coverage amounts from \$1 million to \$2 million per policy.

In regards to Good Agricultural Practices certification, eight respondents reported either that suppliers are required to have certification in hand, or that the supplier must be working toward it.

Other requirements identified as necessary for vendors included post-harvest cold-chain management, Hazard Analysis and Critical Control Points (HACCP) plans for higher-risk items and regular communication by email.

Supply Research Findings

The primary resource for production numbers of the 13 organic items surveyed was the USDA's 2011 Certified Organic Production Survey data for North Carolina. Production numbers weren't provided for organic spinach, so data from the 2007 survey was used. Production numbers weren't provided for cucumbers in either 2007 or 2011; the data here is from organic distributors who represent growers from across the state.

Both the 2011 and 2007, surveys provided very limited production numbers for South Carolina. This is due to the fact that there are only some 700 acres of organic certified cropland in South Carolina on a very few farms. Revealing production numbers, therefore, could have revealed confidential information about individual farms. Given that this acreage is less than one-tenth of the certified cropland acreage in North Carolina, these numbers would have had a minimal effect on the totals.

For the purpose of determining the gap between supply and demand, only demand throughout the months in which these crops can be grown in North Carolina was taken into account. The exceptions here are sweet potatoes, Irish potatoes and cabbage, all of which can be kept in cold storage for extended periods of time.

Wholesale prices paid to farmers for organic commodities were determined through interviews with distributors of organic produce, averaging out, where appropriate, for varieties and dates.

Sweet Potatoes

Sweet Potatoes (January-December)	
Demand in pounds	3,041,904
Supply in pounds	32,475,000
Pounds exported	29,433,096

As noted, North Carolina is the nation's largest sweet potato producer, and demand for organic sweet potatoes is being easily met. According to the USDA's 2011 Certified Organic Production Survey, 1,299 acres of organic sweet potatoes were produced on 11 farms, for a total of nearly 33 million pounds.

Demand in North and South Carolina for organic sweet potatoes was slightly more than 3 million pounds, meaning the state's growers are exporting nearly 30 million pounds of organic sweet potatoes to outside the Carolinas.

Strawberries

Strawberries (April-June)	
Demand in pounds	182,229
Supply in pounds	33,900
Gap in pounds	148,329
Value of gap	\$296,660

According to the USDA's 2011 Certified Organic Production Survey, five farms in North Carolina produced 33,900 pounds of organic strawberries.

Demand for organic strawberries between April and June was 182,229 pounds, creating a gap of 148,329 pounds between supply and demand. The value of that gap was \$296,660.

Broccoli

Broccoli (January-December)	
Demand in pounds	1,412,783
Supply in pounds	83,100
Gap in pounds	1,329,683
Value of gap	\$2,089,500

According to the USDA, 83,100 pounds of organic broccoli was produced on 21 acres on nine farms across the state.

Broccoli can be grown in North Carolina the entire year. Demand throughout 2011 was 1,412,783 pounds, for a gap of 1,329,683 pounds. The value of that gap was \$2,089,500.

Cabbage

Cabbage (January-December)	
Demand in pounds	1,109,895
Supply in pounds	274,800
Gap in pounds	835,095
Value of gap	\$437,000

Cabbage is grown in the state from October to April, but can be stored for up to six months. During the 2011 growing season, 11 farms produced a total of 274,800 pounds of organic cabbage.

Demand for organic cabbage throughout the year was 1,109,895 pounds, creating a gap of 835,095 pounds. The value of that gap was \$437,000.

Summer Squash

Summer Squash (June-October)	
Demand in pounds	472,085
Supply in pounds	89,920
Gap in pounds	382,165
Value of gap	\$382,165

In its Certified Organic Production Survey, the USDA doesn't distinguish between summer squash and winter squash. Based on interviews conducted with N.C. Department of Agriculture & Consumer Services representatives, researchers have estimated summer squash to comprise 80 percent of all squash production in the state. Based on this estimate and numbers from the 2011 survey, supply of organic summer squash was placed at 89,920 pounds.

Demand for organic summer squash through its June to October growing season was 472,085 pounds, for a gap of 382,165 pounds. The value of that gap was \$382,165

Irish Potatoes

Irish Potatoes (January-December)	
Demand in pounds	1,049,281
Supply in pounds	94,700
Gap in pounds	954,581
Value of gap	\$801,850

Irish potatoes are grown in North Carolina from July to April, but can be stored for up to nine months. In 2011, 13 farms in North Carolina grew organic Irish potatoes, with a yield of 94,700 pounds.

Demand for organic Irish potatoes throughout the year was 1,049,281 pounds, creating a gap of 954,581 pounds between supply and demand. The value of that gap was \$801,850.

Tomatoes

Tomatoes (March-August, October- December)	
Demand in pounds	1,914,462
Supply in pounds	767,100
Gap in pounds	1,147,362
Value of gap	\$1,577,620

Between the growing seasons of March to August and October to December, the USDA reported 19 North Carolina farms growing 67 acres of organic tomatoes, for a yield of 767,100 pounds.

Demand for organic tomatoes was 1,914,462, leaving a gap of 1,147,362 pounds between supply and demand. That gap was valued at \$1,577,620.

Cucumbers

Cucumbers (June-September)	
Demand in pounds	174,030
Supply in pounds	46,380
Gap in pounds	127,650
Value of gap	\$153,180

The USDA doesn't report on organic cucumbers in its Certified Organic Production Survey. Research and interviews with North Carolina organic distributors indicated that approximately 46,380 pounds were produced on farms in the state in 2011.

Demand for organic cucumbers between June and September, the growing season in North Carolina, was 174,030 pounds, creating a deficit of 127,650 pounds between supply and demand. The value of that gap was \$153,180.

Bell Peppers

Bell Peppers (June-October)	
Demand in pounds	246,213
Supply in pounds	156,400
Gap in pounds	89,813
Value of gap	\$107,775

According to the 2011 survey, 156,400 pounds of organic bell peppers were produced on 16 acres on 12 farms in the state.

Demand for organic bell peppers in June through October was 246,213 pounds, for a gap of 89,813 pounds between supply and demand. The value of that gap was \$107,775.

Spinach

Spinach (January-December, including bulk frozen)	
Demand in pounds	548,978
Supply in pounds	2,000
Gap in pounds	546,978
Value of gap	\$531,972

Production numbers for organic spinach in North Carolina were not available in the USDA's 2011 Certified Organic Production Survey, so the 2007 survey was used. That year, seven North Carolina farms produced 1,000 pounds of organic spinach from a combined total of two acres of production.

Demand for organic spinach in 2012 was 548,978 pounds, creating a gap of 546,978 pounds, assuming production in 2011 was level with 2007. The value of that gap was \$531,972.

Watermelons

Watermelons (June-August)	
Demand in pounds	262,160
Supply in pounds	32,700
Gap in pounds	229,460
Value of gap	\$54,180

According to the USDA's 2011 survey, five farms in North Carolina produced 32,700 pounds of organic watermelons.

Researchers' market survey found demand for organic watermelons between the growing seasons of June to August to be 16,385 pieces. With an estimated average weight of 16 pounds, that demand is placed at 262,160 pounds, for a gap of 229,460 pounds. The value of that gap was \$54,180.

Leaf Lettuce

Leaf Lettuce (January-December)	
Demand in pounds	688,344
Supply in pounds	58,200
Gap in pounds	630,144
Value of gap	\$712,062

In 2011, 16 farms in North Carolina harvested 58,200 pounds of organic leaf lettuce from a combined seven acres of production.

The market survey tabulated demand for organic leaf lettuce in 24-count cases. Calculating with an estimated average weight of 22.33 pounds for all varieties of leaf lettuce, demand throughout the year was 688,344 pounds, for a gap between supply and demand of 630,144 pounds. The value of that gap was \$712,062.

Sweet Corn

Sweet Corn (June-July)	
Demand in pounds	337,862
Supply in pounds	11,200
Gap in pounds	326,662
Value of gap	\$171,500

According to the USDA's survey, 11,200 pounds of organic sweet corn were produced by three farms on five acres in North Carolina in 2011.

Demand for organic sweet corn in the growing season of June and July was 337,862 pounds, creating a gap of 326,662 pounds between supply and demand. The value of that gap was \$171,500.

Looking Ahead

Demand

Market research clearly indicates that organically certified foods have an established and growing presence in produce sections of mainstream grocers and natural foods stores in the Carolinas. The researchers were able to document current volume demand for organics from produce managers and executives in charge of approximately 500 retail venues located throughout North and South Carolina.

To summarize, total measured annual fresh-market volumes of targeted organic produce items are as follows:

Fresh Produce Item	Volume
Sweet Potatoes	1,539,944 lbs
Strawberries	1,317,597 lbs
Broccoli	1,170,819 lbs
Cabbage	1,108,542 lbs
Summer Squash	924,689 lbs
Irish Potatoes	888,749 lbs
Tomatoes	593,437 lbs
Cucumbers	437,122 lbs
Bell Peppers	319,547 lbs
Spinach	57,950 lbs
Watermelon	49,471 each
Leaf Lettuce	30,826 24-count boxes
Sweet Corn	23,904 48-count boxes

Observations, survey results and conversations with produce managers lead the researchers to conclude the following:

- 1) Organic produce is likely to continue to expand in mainstream grocery stores, especially in more urban areas with high per-capita and median household incomes.
- 2) Organic produce is used as a marketing tool to convey a sense of premium quality on the produce aisle. While in many stores organics are still a small percentage of overall sales, their shelf presence is an indicator of freshness and quality for consumers, regardless of whether they are actually buying the organic produce on display.

- 3) Almost without exception, produce aisles are promoting and selling “locally grown” as much or more than “organically certified.”
- 4) Despite this, very little produce observed in the markets was both organic *and* local. Issues of seasonality, production volumes and price undoubtedly contribute to the low volume of local organic produce. Several produce managers indicated produce that is both organic and local would be in high demand from consumers if it were available in their stores.
- 5) Executives are increasingly enamored of clamshell packaging for organics, especially for loose washed salad greens and strawberries. Researchers believe that clamshell produce supplied by California-based Driscoll’s (berries) and Earthbound Farms (salad greens and more) constitute a significant percentage of overall organic produce sales in the Carolinas.
- 6) The upside growth potential for organic produce in the Carolinas is great. To illustrate this, researchers calculated measured fresh organic consumption as a percentage of estimated total consumption of each specific type of produce. Despite the rapid growth of organic produce sales over the past decade, no single produce item measured in the survey had an organic fresh-market volume in excess of 2 percent of estimated per-capita consumption of that particular commodity. Only organic sweet potatoes, squash, broccoli and strawberries registered more than 1 percent of total consumption.

Per-Capita Consumption Estimates					
Product	U.S. per capita (pounds)*	NC and SC estimated total volume	Measured NC and SC organic	% of total as measured organic	Notes
Sweet Potatoes	6.3	90,314,475	1,539,944	1.71%	fresh only
Summer Squash	4.4	63,076,776	924,689	1.47%	fresh only
Broccoli	5.6	80,279,534	1,170,819	1.46%	fresh only
Strawberries	7.17	102,786,474	1,317,597	1.28%	fresh only
Cabbage	8.3	118,985,737	1,108,542	0.93%	fresh only
Cucumbers	6.6	94,615,165	437,122	0.46%	fresh only
Bell peppers	9.8	140,489,184	319,547	0.23%	fresh only
Tomatoes	18.5	265,209,174	593,437	0.22%	fresh only
Spinach	1.9	27,237,699	57,950	0.21%	fresh only
Irish Potatoes	42	602,096,502	888,749	0.15%	fresh only

*Source: USDA Agricultural Research Service

- 7) Processing of organic produce in the Carolinas may rise as existing processors increase organic handling capacity and as new processors looking for East Coast hubs come to the region. Volumes needed for processing can be tremendous, and can potentially far exceed demand from fresh-market wholesalers and retailers. Still, the needs for a variety of processing services with different technical requirements, along with substantial capital development costs, remain as obstacles to developing a strong organic produce-processing industry in the Carolinas.

To summarize, current demand for select processed organic items (keeping in mind that only North and South Carolina-based processors were surveyed) are as follows:

Processed Produce Item	Volume
Tomatoes	1,960,726 lbs
Sweet Potatoes	1,501,960 lbs
Spinach	491,028 lbs
Bell Peppers	265,224 lbs
Broccoli	241,964 lbs
Irish Potatoes	160,532 lbs
Summer Squash	147,516 lbs
Sweet Corn	144,213 lbs
Strawberries	23,924 lbs
Cabbage	1,353 lbs
Cucumbers	500 lbs

Supply

Researchers determined that for all of the organic products surveyed with the exception of sweet potatoes, there is a considerable gap between consumer demand and current supply.

To summarize, the demand for select organic items during the months in which they can be grown or stored for extended periods (as with potatoes and cabbage) in the Carolinas, the most recent available production numbers for these items and the gap between demand and supply are as follows:

Produce Item	Demand	Supply	Gap	Gap per week of growing season
Broccoli	1,412,783 lbs	83,100 lbs	1,329,683 lbs	25,570 lbs
Tomatoes	1,914,462 lbs	767,100 lbs	1,147,362 lbs	29,098 lbs
Irish Potatoes	1,049,281 lbs	94,700 lbs	954,581 lbs	21,979 lbs
Leaf Lettuce	688,344 lbs	58,200 lbs	630,144 lbs	14,556 lbs
Summer Squash	472,085 lbs	89,920 lbs	382,165 lbs	17,482 lbs
Cabbage	1,109,895 lbs	274,800 lbs	835,095 lbs	27,570 lbs
Sweet Corn	337,862 lbs	11,200 lbs	326,662 lbs	37,504 lbs
Spinach	548,978 lbs	2,000 lbs	546,978 lbs	21,391 lbs
Watermelon	262,160 lbs	32,700 lbs	229,460 lbs	17,463 lbs
Strawberries	182,229 lbs	33,900 lbs	148,329 lbs	11,410 lbs
Cucumbers	174,030 lbs	46,380 lbs	127,650 lbs	7,324 lbs
Bell Peppers	246,213 lbs	156,400 lbs	89,813 lbs	4,109 lbs

To put this in perspective, for North Carolina farmers to displace imported organic produce and meet the demand for these organic items would require a more than 400 percent increase in organic fruit and vegetable production in the state.

Using an estimated average price paid to growers during the height of each item's growing season, the dollar value of this gap is as follows:

Produce Item	Value of gap
Broccoli	\$2,089,500
Tomatoes	\$1,577,620
Irish Potatoes	\$801,850
Leaf Lettuce	\$712,062
Spinach	\$531,972
Cabbage	\$437,000
Summer Squash	\$382,165
Strawberries	\$296,660
Sweet Corn	\$171,500
Cucumbers	\$153,180
Bell Peppers	\$107,775
Watermelon	\$54,180
Total	\$7,315,464

Conventional vs. Organic Wholesale Prices

For comparison purposes, the following chart gives an idea of the difference in conventional and organic prices. These are wholesale prices per pound, calculated from the most common wholesale quantities for each. The conventional prices come from the North Carolina Department of Agriculture and Consumer Services, the organic prices from organic wholesalers, and should be considered as rough averages for the Carolina growing seasons for each.

Produce Item	Conventional Price/lb	Organic Price/lb
Broccoli	\$0.73	\$1.57
Tomatoes	\$1.00	\$1.37
Irish Potatoes	\$0.34	\$0.84
Leaf Lettuce	\$1.04	\$1.13
Summer Squash	\$0.60	\$1.00
Cabbage	\$0.24	\$0.52
Sweet Corn	\$0.33	\$0.53
Spinach	\$0.72	\$0.97
Watermelon	\$0.20	\$0.24
Strawberries	\$1.58	\$2.00
Cucumbers	\$0.50	\$1.20
Bell Peppers	\$0.80	\$1.20

Required Infrastructure

In order to support expanded production of fresh and processed organic produce, certain key infrastructure components must be developed and maintained. Chief among these is an adequate chain of cold-storage handling facilities from the farm to the retail point-of-sale. Farms require walk-in coolers, ice machines and refrigerated trucking. Intermediate aggregation facilities require larger cooler space and dedicated refrigerated trucks.

As noted, the only commodities surveyed here that can be stored for any appreciable length of time are sweet potatoes, Irish potatoes and cabbage. Demand for sweet potatoes is already being met. If adequate storage for Irish potatoes and cabbage were provided, demand could potentially be met year-round.

To give a general idea of infrastructure needs for fresh sale, a quality cooler providing space for 80,000 to 100,000 pounds of potatoes can be purchased for about \$100,000. With a current gap between supply and demand for Irish potatoes of 954,581 pounds, providing storage to meet that demand would require an investment of approximately \$950,000 to \$1.2 million. Infrastructure to meet the demand for cabbage would cost in the \$1.2 million to \$1.5 million range.

The following chart shows optimal temperatures, the storage life and the number of pounds that can be stored on a 48"x40" pallet for each item for which demand is not currently being met:

Produce Item	Temperature	Storage Life	Weight per pallet
Sweet Potatoes	55-60° F	4-7 months	2,500 lbs
Broccoli	32° F	10-14 days	1,000 lbs
Tomatoes	45-60° F	4-7 days	1,000 lbs
Irish Potatoes	40-45° F	4-9 months	2,500 lbs
Leaf Lettuce	32° F	2-3 weeks	700 lbs
Summer Squash	42-50° F	1-2 weeks	1,600 lbs
Cabbage	32° F	3-6 months	1,575 lbs
Sweet Corn	32° F	4-8 days	1,600 lbs
Spinach	32° F	10-14 days	250 lbs
Watermelon	45-60° F	2-3 weeks	700 lbs
Strawberries	32° F	3-7 days	1,600 lbs
Cucumbers	50-55° F	10-14 days	1,600 lbs
Bell Peppers	45-50° F	2-3 weeks	1,200 lbs

In contrast, in processed sales, assigning a value to the total infrastructure required is difficult, especially given that multiple types of processing systems may be applied to every produce

commodity investigated. For example, processing strawberries for fruit filling may require large pureeing, pasteurization, and aseptic packaging systems. Alternatively, processing strawberries for whole, frozen sale would require large-scale IQF facilities.

Researchers believe that either of these types of processing would require millions of dollars in infrastructure investments. Likewise, large-scale automated cutting, blanching and IQF systems would be required for frozen peppers, squash and cucumbers. Experts estimate that the cost of building a vegetable blanching and IQF system at \$5 million, and that it would require a volume sufficient for five months of continuous use to be economically viable.

In sum, determining the investment cost of any major processing system would require particulars about the size, location and specific processes to have any use for consumers of this research.

A Final Word

In the course of this research, grocery store produce managers were asked if in the past three years they had experienced an increase in demand for certified-organic produce: 93 percent of respondents reported that they had. North Carolina growers, especially small and medium-sized farms that were formerly dependent on tobacco, stand poised to capitalize on this high-value market opportunity.

There are clearly significant positive prospects for North Carolina farmers in the production of organic vegetables and fruits. The research presented here has documented a considerable gap between the local demand for organic products and what the Carolina's growers are currently supplying. Of the 13 organic products researched, the local demand for sweet potatoes is the only one being met by North Carolina growers, leaving an annual gap of nearly seven million pounds for the other 12 items. The estimated value of that gap is just over \$7 million per year.

Since 2000, annual sales of organic produce have increased nationally every year by at least ten percent, even during the depths of the recent recession, according to the Organic Trade Association. The potential for increased per capita consumption of organic produce in the region, the historic market growth in the sector overall, and the state's advantageous growing conditions for organic produce suggest that the value of local organic produce sales through the wholesale channels evaluated in this report is likely to increase steadily in future years.

Infrastructure investments are required to capitalize on these opportunities, especially to meet the demand for processed organic produce items. Given the annual revenue potential for the state's formerly tobacco-dependent farmers and communities where they live, creation of that infrastructure would be a very sound, long-term investment.

Appendix

The survey tools can be found at:

<http://www.surveymonkey.com/s/CFSARetailOPMS>

<http://www.surveymonkey.com/s/CFSAWholesaleOPMS>