NORTHEAST AGRICULTURE

INSIGHTS & PERSPECTIVES

2017

ECONOMIC ANALYSIS & PAPERS ON AGRICULTURE, COMMERCIAL FISHING & THE FOREST PRODUCTS INDUSTRY

FARM CREDIT EAST

FARM CREDIT EAST

Dear Farm Credit East Customer:

It seems like the pace of change in agriculture, forest products and commercial fishing continues to accelerate. This year brings a new administration, along with changing consumer trends and advances in production technology, all of which impact how Farm Credit East's customer owners do business.

Amid the constant whirl of change, however, there are also certain tenets that remain constant, especially our customers' resilience. In the face of headwinds in many sectors of agriculture and the other industries we serve, we are always encouraged by how Farm Credit East's customer owners make adjustments in their businesses to continue to succeed and grow.

Farm Credit East strives to be a steadfast partner in that success, by providing the necessary capital and financial services for your business. As part of our products and services offerings, Farm Credit East also seeks to provide the knowledge and expertise you need to inform your business decisions.

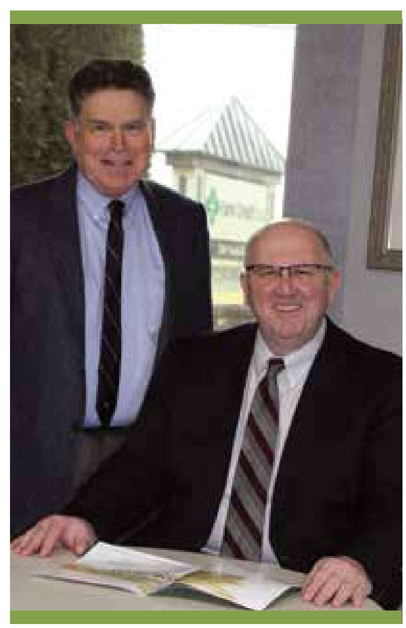
That's why we are pleased to share with you the 2017 edition of **Northeast Agriculture: Insights and Perspectives**. Our 2017 report provides outlooks and insights from Farm Credit East's seasoned staff and outside experts. Our internal reports include articles on strategies for challenging times and straight talk on what to expect from your Farm Credit East lender.

We are also pleased to have ten papers developed by external academic and industry experts, covering a number of sectors and topics.

- Food Marketing, Sophie Winter, SUNY Cobleskill
- Grain and Oilseed Outlook, Patrick Westhoff, University of Missouri
- Digital Agriculture, Harold van Es and Joshua Woodard, Cornell University
- Leadership Development, Larry Van De Valk, LEAD New York
- Dairy Outlook, Mark Stephenson, University of Wisconsin
- Northeast Vegetable Crops Outlook, Steve Reiners, Cornell University
- Low Grade Wood Markets, Eric Kingsley, INRS, Maine
- Greenhouse and Nursery Outlook, Charles Hall, Texas A&M
- Implications of FSMA for Northeast Farms, John Bovay, University of Connecticut
- Groundfishing Overview, Hank Soule, Sustainable Harvest Sector Cooperative, Maine

In addition to this report, our Knowledge Exchange program provides content throughout the year, including our monthly electronic **Knowledge Exchange Partner** and webinars on timely topics, such as market conditions and regulatory challenges. In conjunction with credit and financial services experts, we have also developed benchmark programs and analysis to help farm businesses identify opportunities for improvements.

We understand that our success is a result of our customers' success, and hope that the information in this report will stimulate your thinking, provide a new point of view and assist your planning as you adjust to 2017's changing business conditions.



Sincerely,

James Putnam
Chief Business Officer

William J. Lipinski
Chief Executive Officer

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Report prepared by Farm Credit East Knowledge Exchange & Communications

Robert Smith, Executive Vice President and Corporate Secretary
Tom Cosgrove, Senior Vice President for Public Affairs and Knowledge Exchange
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Jill Eyre, Coordinator for Public Affairs
Kristie Schmitt, Director of Marketing and Communications
Heather Hunt, Knowledge Exchange and Communications Specialist

MAKE THE MOST OF YOUR LOAN OFFICER

FARM CREDIT EAST
EXECUTIVE VICE PRESIDENTS:

GARY BRADLEY

JOHN CALTABIANO

BRIAN MONCKTON

FREDERICK MORTON

MICHAEL REYNOLDS

Credit . . . it's our middle name at Farm Credit East and an essential input for most businesses.

At the heart of our lending operations are our branch-based loan officers. While some financial institutions have taken people out of the credit delivery process, for most Farm Credit East customer owners, their loan officer plays a key role in how they access credit. Farm Credit East employs a "relationship lending" model, as compared to a transactional lending approach. Relationship lending requires a good understanding of the business, insights on how the business has evolved and planned business changes.

Given the important role of the loan officer in this process, we asked Farm Credit East's regional managers what customers should expect from their loan officers and how a business owner/manager can get the most value.

Admittedly some of this article might strike our readers as a ***Blinding Glimpse of the Obvious!*** You expect your loan officer to conveniently turn your loan request into available funds for investment in your business. The easier and quicker this happens, the better, right? While this is important, over time, bringing expertise and a different perspective to the table can also add real value. The following is our regional managers' list of seven key attributes you can expect from your loan officer and why they're important.

1

A LENDER *who is there when you need them*

Farm Credit East has a long tradition of "on farm service." Our delivery model continues to rely on loan officers who meet with you at your place of business or the "kitchen table." We have maintained a branch office structure that assures a loan officer is no more than two hours away throughout the majority of our service area. You can reach our staff in the office or via cell phone, email or text message. There is also a backup to your loan officer who can answer questions and advance approved funds in their absence, with the default always being your local branch manager.

To provide an online presence for you to conveniently access your information, Farm Credit East created member access on our website, where you can exchange documents and information in a secure manner. Additionally, Farm Credit East Mobile Banking is a convenient and secure way to check balances, manage your loan accounts and approve transactions right from your mobile device. Recently we added text chat functionality to our website. More than ever, your loan officer and support team are available to you via a variety of communications methods in real time.

2

A LENDER *who knows your industry and business*

Understanding your business and the industry in which you operate is central to loan decisions. This is the cornerstone of Farm Credit East's relationship lending. Our delivery model puts a loan officer at your farm, with the time, tools and personal commitment to know your business and to know you as an individual. Loan decisions are made based on the track record of your business and the viability of your future plans, not on a cookie cutter computer model. We invest substantial resources in developing industry benchmarks and following industry trends and forecasts. You can expect to see Farm Credit East staff at industry meetings and educational venues getting smarter about your industry.

3

A LENDER *who is forward-looking*

As progressive operators, you have plans for the future and we want to be your partner in that future. This requires a loan officer who can look beyond the current request and help to position your business, from a borrowing standpoint, for future needs. Farm Credit East loan officers spend significant time in making sure that the current loan request not only meets the current needs, but will position your business for those future needs as well. We never want to knowingly lend borrowers their last dollar, meaning we always want to plan for credit flexibility during both good times and bad. If you aspire to someday purchase "the farm next door" or to make the next large investment, a Farm Credit East loan officer can counsel you as to what it will take.

4

A LENDER *who makes safe and sound loans*

As a cooperative lender, Farm Credit East has a double-edged responsibility in making loans. The loan must be safe for your cooperative to put on its books, but it also must be sound for you the borrower, meaning that the projected outcome of the loan will enhance the profitability and financial viability of your business. An earlier generation of Farm Credit leaders called that "constructive credit." Today we might call it "win-win." The loan is good for the cooperative and it is good for the individual borrower.

5

A LENDER *who can be your advocate*

We expect our loan officers to develop sufficient information and analysis to recommend a loan that is safe for Farm Credit East and sound for the borrower. They may ask you for additional information, more detailed financial data or financial projections. Your loan officer wants to get it right, so the more they know, the more likely they can offer you the best loan terms and structure. During the approval process, your loan officer will be telling your story and making the best case for your loan request. That being said, the safe and sound concept obligates the loan officer to always wear their Farm Credit East hat in terms of assuring that the loan approval, the required security and loan conditions are in the best interest of the cooperative in assuring full repayment of the loan.

6

A LENDER *with straight talk and added value*

As your relationship lender, Farm Credit East's goal is to always have open and honest communication: straight talk. Regardless of the decision, you can expect your loan officer to share the *why* a decision was made and the rationale for how we structured the loan. Our loan officers go even further. As you share earnings and balance sheet statements, loan officers can share their views on meaningful trends, strengths and weaknesses. As they understand your plans and long-term goals, they can offer input as to how you can better position yourself for future loan approvals, and ultimately for greater business success. Your loan officer will inform you about additional services such as improved financial record-keeping, tax planning, succession planning and risk management.

7

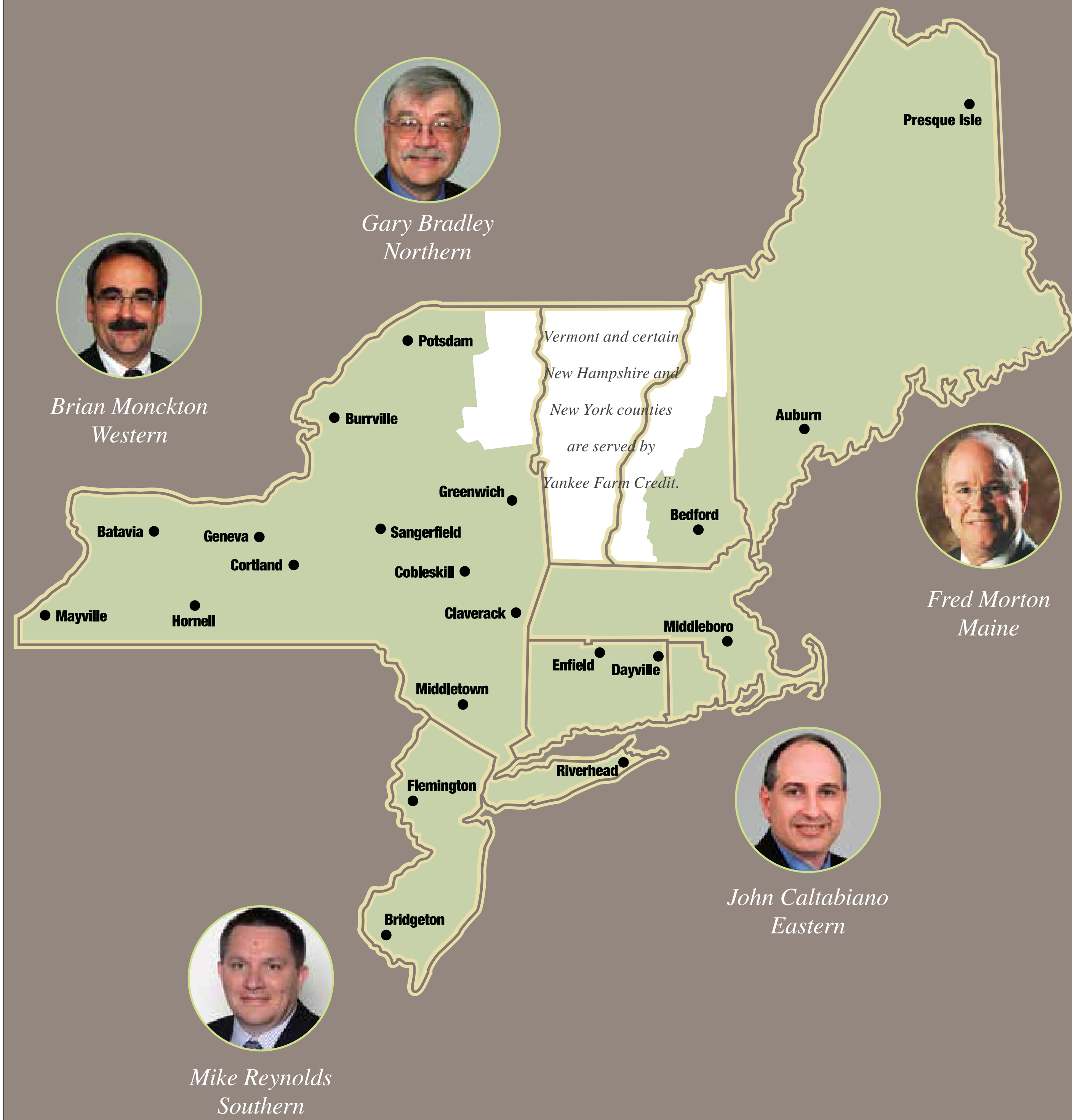
A LENDER *who respects your confidentiality*

From our borrower-elected Board of Directors to the CEO and throughout the entire Farm Credit East team, we strive for highly ethical relationships. We understand that your trust in our cooperative and its people has been earned on every interaction.

You are justified in being sensitive to the confidentiality of your most private personal identification and financial information in the age of cyber-attacks. Farm Credit East will continue to invest in secure digital technology, update business practices, train all employees and engage outside audits to test our security.

These attributes are the essence of the customer experience when you rely on Farm Credit East for credit, and loan officers play a key role in making your experience a positive one. That is why Farm Credit East continues to train our loan officers to provide you with exceptional value to make a positive impact on your business. ◆

— FARM CREDIT EAST REGIONAL MANAGERS —



THE NORTHEAST FARM ECONOMY

CHRIS LAUGHTON
Director of Knowledge Exchange
Farm Credit East

The National Economy

U.S. economic growth accelerated during 2016[1], bringing inflation-adjusted expansion to about 1.6 percent for 2016. U.S. GDP growth is projected to increase to about 2.3 percent in 2017, continuing the trend of moderate but consistent growth in the U.S. economy.

While current U.S. growth rates have been modest, they have been sufficient to cause tightening in the labor market. Headline unemployment fell from 4.9 percent in January to 4.6 percent in November. Job growth averaged a healthy 180,000 per month for the first 11 months of 2016[2]. Nonetheless, the labor force participation rate (LFPR) remained historically low, bottoming out in November 2015 at 62.4 percent, and remaining relatively flat at 62.7 percent for most of 2016. The LFPR peaked in 2000 at 67.3 percent, and has been declining slowly since, due to a combination of economics and demographics. Although some discouraged workers are sitting on the sidelines, the overall labor market seems to be improving. November average hourly earnings were up 2.5 percent, year-over-year.

Increased hiring and wages generally means a more upbeat consumer and expansion of consumer spending, a key driver of the U.S. economy. The Consumer Confidence Index remained high during the year, averaging 98.3, compared to 97.8 in 2015, and 86.9 in 2014[3]. U.S. retail sales grew by 4.2 percent in October, year-over-year[4].

Inflation remained modest, coming in at 1.6 percent in October, year-over-year, well below the Federal Reserve's target rate of 2 percent. Still, the Fed decided to raise interest rates by 25 basis points, or one-quarter of a percent, at its December meeting. This follows a 25 basis point increase in December 2015, which ended an 84-month run at near-zero percent interest rates. Projections indicate that we could see three more quarter-point rate increases over the next year.

Despite the monetary tightening by the Fed, the U.S. housing market is expected to continue its upward momentum. Housing starts averaged 1.2 million for the first 10 months of 2016, a 5 percent rise over 2015's average. The S&P/Case-Shiller 20-City Composite Home Price Index rose by 5.2 percent from September 2015 to September 2016.

The U.S. dollar continued to gain strength against foreign currencies in 2016, with a trade-weighted index value of 94.6 in December compared to 94.1 in December 2015, and 84.2 in December 2014[5]. Improving economic conditions in the U.S. relative to other major trading partners will likely cause the dollar to strengthen further. This has been bad news for U.S. exporters and agricultural commodities by making our products relatively more expensive for foreign buyers.

Looking abroad, global economic growth is expected to be relatively modest. The world economy is estimated to grow by 3.1 percent in 2017. Advanced economies are expected to grow by 1.6 percent, while developing countries are expected to grow by 4.2 percent. China is experiencing a cooling off of its economy, with growth projected to decline from 6.6 percent in 2016 to 6.2 percent in 2017.

The slowing growth of China's economy has contributed to a global decline in commodity prices. While trends of population growth and a growing middle class in the developing world support a long-term bullish outlook for U.S. agriculture, in the near term, many commodities markets are expected to remain soft. USDA long-term projections indicate reduced farm income through at least the next crop year before global food and biofuel demand equalizes with supply, and farm incomes begin to slowly rise.

Legislative and Regulatory Issues

Regulatory burdens remain a hot topic among Northeast producers. Farm Credit East continues to advocate for a favorable regulatory environment for agriculture. Immigration and guest worker programs are still a top concern of farmers, however, given the current political climate, there is no apparent path forward for comprehensive reforms, though some in agriculture see a possible opening for a specific agricultural guest worker program.

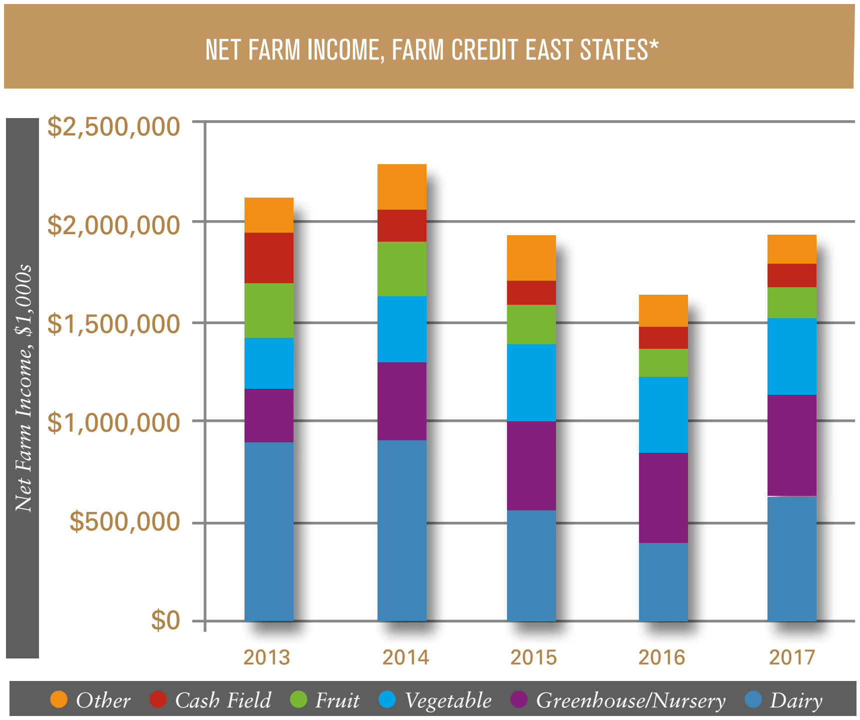
[1] Average of forecasts from The Economist Intelligence Unit; the OECD; Trading Economics; and The Conference Board. Adjusted for inflation.

[2] U.S. Bureau of Labor Statistics

[3] The Conference Board (Consumer Confidence Index, 1985=100).

[4] U.S. Census Bureau

[5] Federal Reserve, Trade-Weighted Index: Major Currencies (March 1973=100)



*CT, ME, MA, NH, NJ, NY, and RI

Source:
Farm Credit East
Knowledge Exchange Estimates

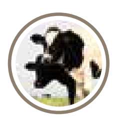
The incoming Trump administration has signaled a desire to roll back regulations it feels are hurting American business, however, many federal laws and regulations may prove harder to unwind than it may appear at first glance. Another factor is that many Northeast regulations come from the states, and are likely to remain in place.

The Food Safety Modernization Act has started to take effect for some farms, and others will have to comply over the next four years. Although the incoming administration promises to "repeal and replace" The Affordable Care Act, it remains law for now, and may have significant impacts for producers in the coming year. Another key regulation that is currently on hold per a federal court order is the EPA's Waters of the United States ("WOTUS") regulation, a rule that the incoming Administration has also criticized.

On the legislative front, Congressional work is set to begin in 2017 on the 2018 Farm Bill. Major programs in the bill like SNAP (Supplemental Nutrition Assistance Program) and crop insurance could face changes driven by budgetary pressures to cut spending. The Trump Administration's position on Farm Bill programs are still evolving at this time.

There are also issues of interest at the state level. Several states have increased minimum wage rates, and there continues to be ongoing discussions relating to tightening labor regulations and proposals, such as mandatory overtime pay for farmworkers.

The Farm Economy:



Dairy

2016 was another challenging year for Northeast dairy producers, as milk prices fell roughly $1.26/cwt., or 8 percent from 2015, which itself was a tough year. Farms continue to show a wide range of operating results, with many farms managing to cope with the low price environment, while others struggle to cover expenses. 2017 promises moderate recovery, with prices expected to average anywhere from $1.50 to $2/cwt. higher than 2016.

- Despite negative market signals, the U.S. dairy herd reached a seven-year high in August of 2016, and milk production was 2.5 percent higher in October, year-over-year.
- U.S. dairy production varied significantly by region during 2016, with many Western states moderately increasing production, while Midwestern and Eastern states showed greater increases. In California, the largest dairy producing state, milk production increased by 1.8 percent. Meanwhile, New York had a 4.7 percent increase, year-over-year, as of October.
- Feed costs are expected to fall to the lowest level since 2010, providing some margin relief, but not enough to fully make up for low milk prices.
- Global milk production has slowed somewhat, with major exporting regions such as the EU and New Zealand, showing production declines. Meanwhile China and other major importers have been more active. This has led to rising international prices for dairy products, making U.S. products more competitive. While overall dairy export value declined in 2016, projections are for exports to

increase in 2017.

- The Dairy Margin Protection Program completed its second year in 2016. The program, which allows producers to insure income-over-feed-costs at levels between $4 and $8/cwt., has made minimal payouts thus far. LGM-Dairy remains a viable option for producers who have not participated in MPP.
- Demand for organic dairy products, particularly fluid milk and yogurt remains strong, showing increases in 2016. Organic milk continues to sell at a significant premium to conventional milk, but production expenses are also higher. Still, margins for organic producers remain attractive, drawing interest from some conventional producers in converting to organic. Some organic buyers have established waiting lists due to the increase in farms wanting to convert.

Forest Products

There is a tremendous diversity of businesses in the forest products industry, and their economics do not always track together. During 2016 we saw a divergence in financial performance within the industry, driven heavily by the regional impact of a significant number of pulp and paper mill closings in Maine.

Timberland Investment

Timberland continues to be a desirable asset for not only those businesses within the forest products sector, but for investor groups as well. Although some categories of wood products have been impacted by downward pressure on pricing, demand for quality timberland has not been affected, and recent sales have shown no softening in values.

Softwood

- Most softwood and panel products saw improved prices during 2016. The Crow's lumber composite price increased by 12.7 percent during 2016[6].
- Although many North American Spruce/Pine/Fir sawmills benefited from higher prices for lumber, sawmills in the Northeast U.S. did not fare quite as well. With the substantial decline in both pulp and pellet capacity in Maine, the value of sawmill residuals has fallen. This resulted in many mills seeing little improvement in net income as higher lumber prices were offset by lower values for residuals.
- The Softwood Lumber Agreement between the U.S. and Canada expired in October 2015. Since then, Canadian lumber imports have surged from 29.5 percent of total U.S. consumption to 34.1 percent. Consequently, the U.S. lumber coalition filed suit in November for duties on Canadian lumber, in what is expected to be a protracted dispute.
- The outlook for 2017 remains positive with many analysts expecting further improvement in softwood lumber prices. This will be driven by a combination of higher demand resulting from further improvement in housing, some level of duty on Canadian lumber imports and the demand-capacity ratio for lumber production projected to reach 88 percent in 2017.
- The Spruce Budworm outbreak in eastern Canada is spreading to the south. The outbreak is being closely monitored on both sides of the border, as it will impact the industry financially.

Hardwood

- Limited improvement in lumber prices, especially for certain species, occurred in 2016. The overall market continues to be challenging. The strengthening U.S. dollar remains a concern for hardwood lumber which has been relying heavily on exports to absorb U.S. production.
- Biomass generation plants have struggled in 2016 as wholesale electricity prices remain low. The lack of a market for renewable energy credits (RECs) from Southern New England states has pushed cash flows negative. Consequently five biomass plants in Maine ceased power production in mid-2016. Two have subsequently come back online in late 2016 as a result of a subsidy from the state.
- A drop in oil prices and an abnormally warm 2015-16 winter, resulted in an oversupply of wood pellets and the idling of several mills. Wholesale pellet prices remain low.

Pulp and Paper

- Continued adjustments in the pulp and paper sector occurred in 2016 throughout all of North America, and especially in the Northeast. Maine has seen four pulp and paper mills close in the last 18 months and one idle half of its capacity. This has impacted both pulpwood prices and sawmill residuals negatively. It will be several years before the Northeast adjusts to these reduced levels of pulp demand. This has impacted the logging sector, with landowners also seeing reduced stumpage prices and wood revenues.

Logging

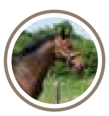
- Loggers in Northern Maine have faced substantial challenges. With declining price and demand for pulpwood, most timberland owners have reduced overall harvest levels. Many contractors have been unable to harvest sufficient volumes of wood to generate positive cash flows, with some idling their operations.
- Contractors within central and southern Maine have generally fared better. Although they have been impacted by constrained pulp markets, sawlog markets continue to be firm.
- Finally, contractors outside of Maine are generally in balance with the demands of the market. Markets, although not numerous, appear to be stable and adequate.

Cash Field Crops

There was a wide range in yields throughout the Northeast due to rainfall and availability of irrigation. Growing conditions were highly variable this year, with significant drought experienced in Western New York and parts of New England.

[6]Crow's Weekly Market Report – December 16, 2016

- Corn yields in western New York were disappointing, with conditions generally worsening the further west in the state. The state averaged 133 bu/acre. Some producers in areas with adequate rainfall seeing above-trend yields, while those in drought-stricken areas got half a crop or less.
- In New Jersey, 2016 was an exceptional growing year due to ample rain throughout most of the season, supplemented by irrigation. For corn, yields were well above the historic average of 150 bushels/acre, with highs exceeding 200 bu/acre. Soybeans were above average, ranging from 45-65 bu/acre.
- Land prices and rents vary widely. New York rents range from zero to as high as $300/acre. Rents in New Jersey typically range from $50-200/acre. Sales typically range from $3,000-$4,000 in the majority of rural New York, and $6,000-8,000 in New Jersey.
- Commodity prices have significantly declined from earlier highs. Pricing for corn is around $3.40, and soybeans around $10.25/bu. Wheat prices remain weak. Input costs, namely fertilizer, have decreased slightly.



Livestock

This is a very diverse sector ranging from beef or other protein producers, both full- and part-time, as well as equine, which itself can be broken down into racing/breeding, and boarding and training enterprises.

- Beef prices hit record levels in November 2014, peaking at $167/cwt., before starting to decline, falling to $101/cwt. by October 2016. However, many Northeast beef producers serve specialty markets and receive significantly higher prices than national averages.
- In horse racing, New York has one of the best racing and breeding incentive programs in the U.S. The primary price driver is the improved general economy and the New York state bred program incentives, supported by state lottery revenues. Prices remain strong for New York bred horses. Farm real estate investment is expected to remain stable.
- New Jersey lacks the strong racing and breeding incentive program that New York has. This has had a negative impact on the Standardbred race horse industry in New Jersey.
- Equine markets in New England and parts of New Jersey and New York are supported principally by local recreational demand across a variety of equine business models.
  - » Boarding facilities report mixed results with some struggling to break even and others reporting good financial results. Low cost operations and those with more desirable facilities have generally seen better margins.

Fruit

This is a diverse category consisting of fresh market and processing apples and other tree fruit, blueberries, cranberries, grapes for jelly and juice in western New York, farm wineries, and other niche products. There is substantial wholesaling into national fresh produce channels from the major producing areas as well as significant on-farm retailing.

- After weather, farm labor and rising input costs are primary concerns. Availability of reliable, legal and affordable labor continues to be a major issue. Many fruit growers rely on H-2A labor. The administrative burden associated with this program remains a headache for many growers.

Tree Fruit

- New York's apple production dropped by 12 percent from 2015, coming in at just about their 5-year average.[7] Total U.S. production was four percent greater than 2015.
- 2016 yields in the Hudson Valley were sharply reduced due to a late freeze. The Lake Ontario region reports declining overall returns due to small sized fruit on the processing side. Fresh market growers reported mixed results depending largely on irrigation capacity.
- The fresh market for apples is becoming more bifurcated, with newer varieties commanding premiums, while older types have become commodities.

Juice Grapes

- Favorable growing conditions led to an above average crop for most in 2016. Combining the last four years of harvest, the oversupply of grape juice continues to be an issue, and has kept prices low, but stable.
- Overall, there are some concerns about juice grape markets and varieties. Contracts were cut and allocations continued for 2016 by one main juice buyer. Supply is higher, while demand is steady or slightly lower.

Wine

- A cold snap in upstate New York impacted production for many wine grape growers in the Finger Lakes and other northern growing regions. In addition, extremely dry conditions across most of western New York resulted in reduced yields. Extended mild weather this fall allowed grapes that remained to attain ripeness and some project 2016 red wines will be of high quality.
- The 2016 harvest supplied minimally adequate grapes for making wine again, and some varieties are in very short supply. Overall prices were higher in 2016 by 5 to 10 percent.
- The Long Island wine industry in general saw solid growth in sales across the board due to favorable weather, as well as continued positive press regarding the quality of Long Island wines.

Cranberries

- The cranberry market continues to struggle with oversupply, and spot prices are extremely low, well below cost of production. The economics of cranberry producers are mainly influenced by how they market their fruit.

Greenhouse and Nursery

Northeast greenhouse and nursery growers generally reported a good year. Reasonably good

[7]USApple Association 2016 Production & Utilization Analysis

weather during much of the spring sales season, and increased consumer spending is credited for the successful season.

- Growers reported that demand and pricing generally held steady in 2016.
- Energy costs have remained moderate, helping keep production costs in line, affecting everything from heating to production and shipping, as well as supplies such as plastics.
- Big box chains continue to dominate the retail market. Growers who sell to them must be very efficient and manage tight margins in order to survive. These major retailers are increasingly demanding more services from vendors, raising the cost to producers.
- Growth in organics and edibles continues, but at a more moderate pace than in recent years.
- There is growing interest in non-traditional greenhouses, primarily for vegetable production, such as roof top structures, vertical greenhouses etc., particularly in metropolitan areas.
- Shortages of some plant materials, particularly caliper-sized trees are being experienced, and it appears this will continue at least through 2017.
- In some areas, drought conditions and watering bans significantly affected summer and fall sales.
- As with other agricultural sectors, labor supply continues to be a major issue.

Fishing

This is a diverse customer segment encompassing several types of wild-catch fisheries, such as lobster, scallops and groundfish, as well as aquaculture, which is a small but growing segment. The economics of each segment move independently, with lobster and scallops performing well, while the groundfish segment continues to struggle.

Lobster

- 121 million pounds of lobster were landed in Maine during 2015, valued at a record $495 million, a $40 million increase over 2014. 2016 landings and prices continued to be strong and most operators had another good year.
- Higher costs of production have squeezed margins for lobstermen over the past several years, but moderate fuel costs have helped somewhat. Bait supply has been a concern.

Scallops

- Prices were high and slightly above 2015, averaging $14.21/lb. Pricing is expected to remain at similar levels in 2017.
- For the 2016 fishing year, full time scallopers were allocated increased days-at-sea.
- The stock remains strong, is considered to be sustainable and we do not anticipate any severe regulatory changes in the near future.

Groundfish

- Although the stocks of many protected species of groundfish are rebuilt, regulations and quotas remain limiting for the industry.
- Permit trading was limited in 2016 as regulations continued to ratchet down quotas and days-at-sea. The Northeast's groundfish fleet is aging and with stringent regulations and an unclear future. Reinvestment is difficult. That being said, there are some large multi-national corporations looking to buy existing groundfish boats in order to vertically integrate their operations. Also, some of the larger players with ample quota have invested significantly into upgrading their equipment.
- Prices have held steady, and the catch was good on the species they were allowed to land.

Vegetables

There is substantial diversity within the vegetable market segment as a wide range of crops are grown by a broad mix of farms. Producers range from potato growers in Maine, to large-scale farms growing for processing markets, to smaller CSA operations. Suburban growers typically grow a mix of fresh vegetables for a combination of on-farm retail, farmers markets and local supermarkets.

- Primary drivers for wholesale markets are weather and production volume from competing regions during their market window(s). For the more retail/local market oriented growers, weekend weather during the sales season and consumer spending patterns are significant factors.
- In the New York processing market, vegetable acres appear to remain stable in the coming year. Pricing will be lower as it tends to follow the grain market.
- In Southern New Jersey, growing conditions were very good, resulting in good quality and yields, but market prices were well below average for most crops, resulting in a breakeven earnings year.
- In New England, 2016 was challenging due to drought conditions in the region. Farmers reported average production and better than average quality. Most producers had access to irrigation, which proved critical this year. 2016 prices remained similar to 2015.
- CSA (Community Supported Agriculture) farms continue to gain popularity. There are some reports that this market is beginning to mature due to multiple growers competing for a limited number of consumers who wish to buy produce in this way.
- Wholesale buyers and consumers increasingly seek out local product. "Buy local" has become a significant trend, especially in metro areas. However, this does not necessarily translate into a willingness to pay higher prices.
- Availability (and affordability) of good farmland in key areas is limiting expansion. Labor is also a serious concern for this sector. Some growers are shifting to H-2A labor.
- 2016 showed excellent growing conditions for potatoes in northern Maine. Yields were average to slightly above average. Potato prices were generally better than last year.

Mike Northrup, owner of Northrup and Sons, LLC in Rodman, N.Y.

PRODUCER PERSPECTIVES ON INDUSTRY OUTLOOK

Pulse of Agriculture Survey

HEATHER HUNT
Knowledge Exchange and Communications Specialist, Farm Credit East

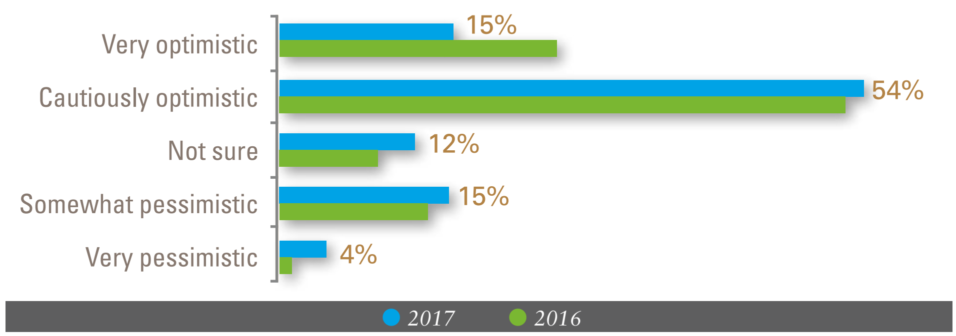
For several years, as the calendar turns to a new year, Farm Credit East polled Northeast producers in its "Pulse of Agriculture" survey. This year, a cross section of more than 150 Northeast producers provided their perspectives on doing business in 2017 and some preliminary feedback about their 2016 business results.

The survey results provide a current indication of producers' expectations and concerns, and context for the articles in this publication. As indicated by the results, despite challenges, Northeast producers are generally optimistic and looking to grow, thereby demonstrating their resilience and Farm Credit East's positive outlook. The following charts compare this year's survey results to those from last year.

Northeast producers cautiously optimistic about their future

Going into 2017, almost 70 percent of participants indicated they are optimistic or cautiously optimistic for the future of their enterprise.

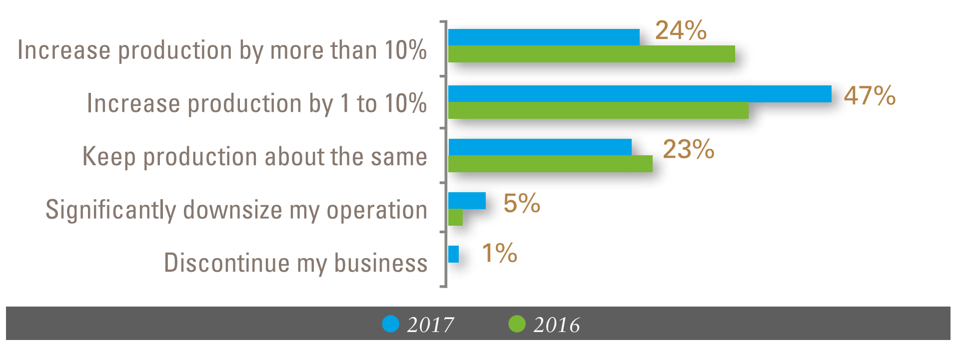
FOR THE STATE/COUNTY IN WHICH YOU FARM, WHAT IS YOUR VIEW OF THE FUTURE FOR YOUR TYPE OF ENTERPRISE?



Northeast producers still growth-minded for 2017

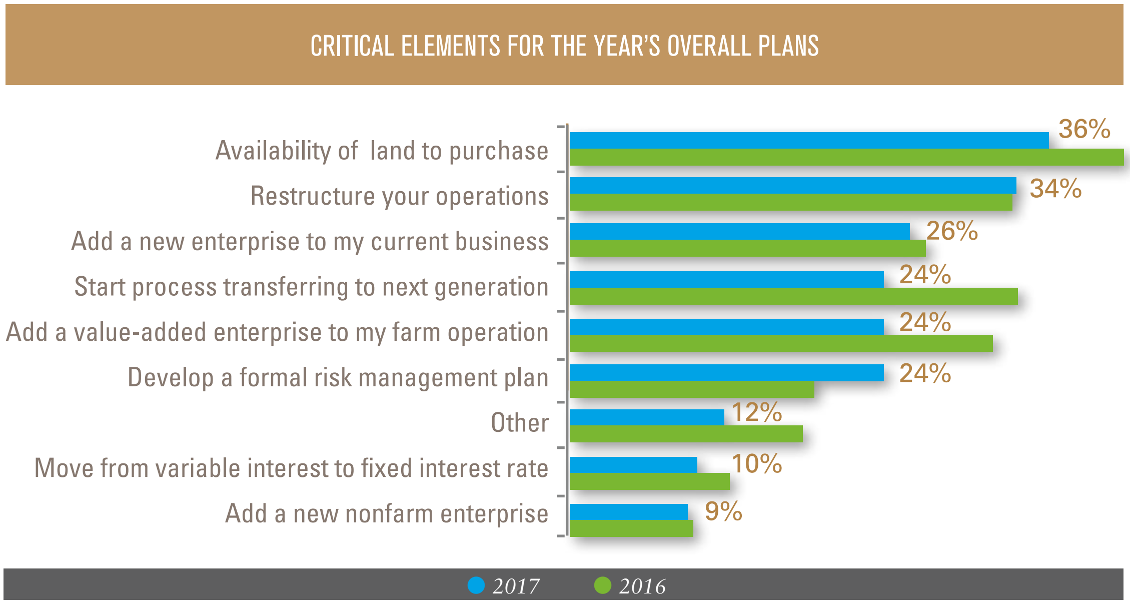
Producers have similar business goals to grow production, as they did last year. However, growth is more modest compared to 2016, with almost half of the respondents choosing to increase production between only 1 to 10 percent. Still, 24 percent of producers are planning on a more than 10 percent increase.

WHAT ARE YOUR BUSINESS GOALS FOR THE YEAR?



Strategic plans for 2017

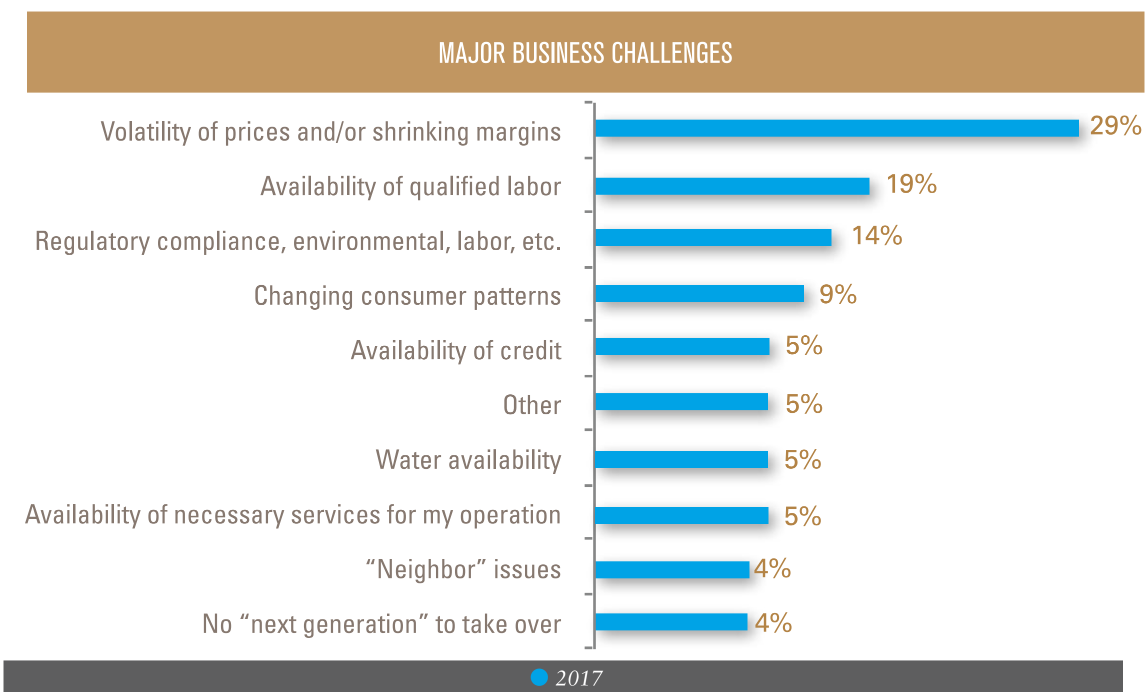
Northeast producers are targeting a number of areas for business improvement this year. Note that in answering this question, many indicated more than one strategic direction that they intend to pursue. The top consideration was the availability of land to purchase (36 percent of respondents), followed by restructuring of operations (34 percent) and adding a new enterprise to a current business (26 percent).



Many challenges faced by Northeast farming, fishing and forestry businesses

Participants were asked to award 100 points in total to various challenges that their businesses face in 2017 to understand their view of the business climate and any headwinds they are facing. Producers' 2017 concerns are spread across the board, with skrinking margins and lower prices, labor availability and regulatory compliance topping the list.

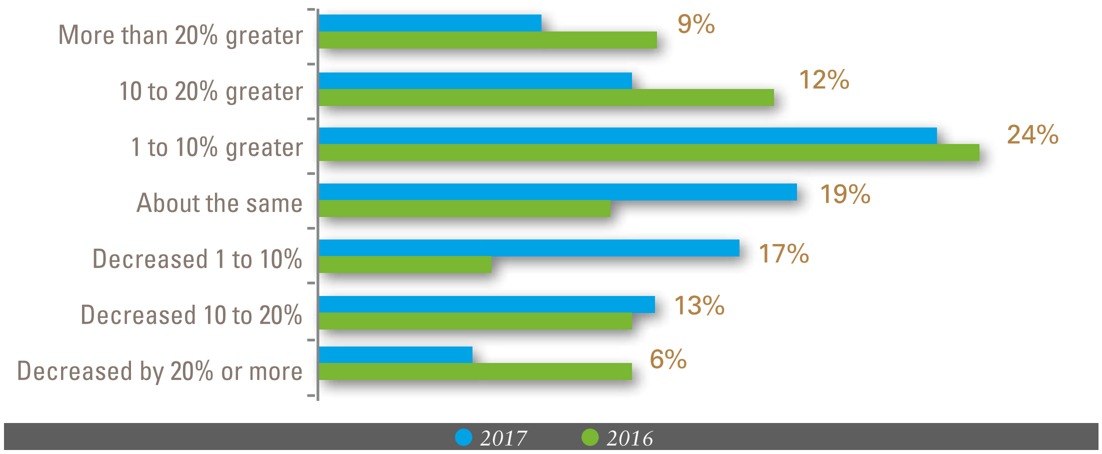
Many of these concerns were also cited in the 2016 survey, although 2016 results are not shown as some of this question's categories were modified from the previous year.



Looking back...

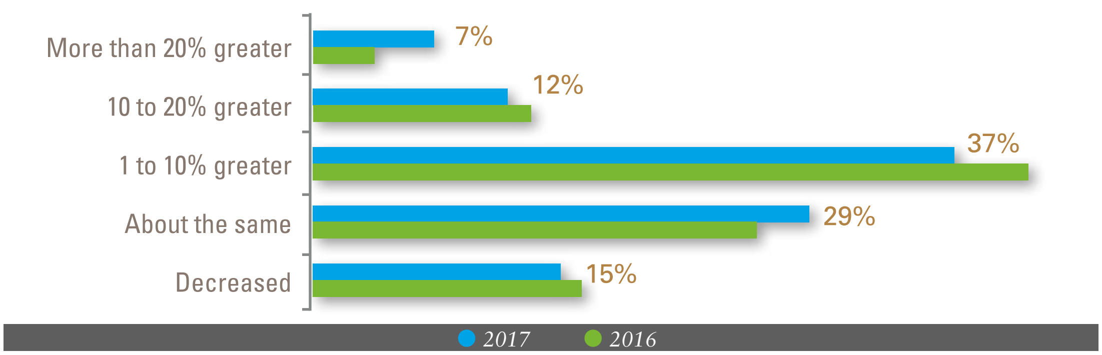
We asked respondents about the previous year's operating conditions and results.

WHEN COMPARED TO THE PREVIOUS YEAR, MY FARM'S GROSS INCOME (TOP LINE) WAS:

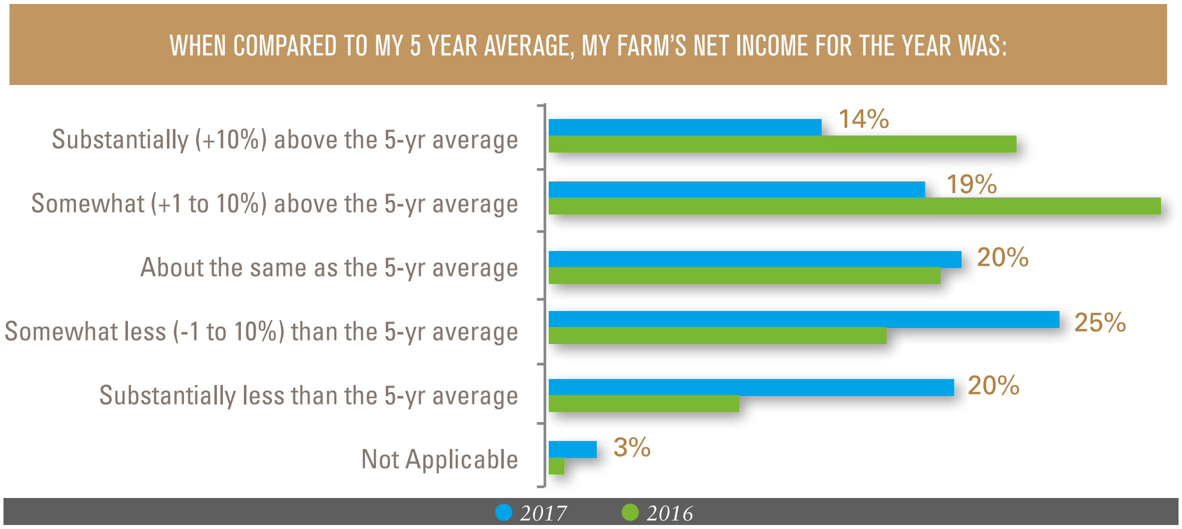


45 percent of respondents saw growth in their top line income in 2016, a drop of 11 percent from 2015. About 36 percent saw a decrease in their farm's gross income, while 19 percent felt they had about the same gross income.

WHEN COMPARED TO THE PREVIOUS YEAR, MY FARM'S TOTAL EXPENSES WERE:



A majority of producers (56 percent) continued to see cost inflation in their business compared to 60 percent in 2015.



45 percent of participants indicated their 2016 net income was lower than 2015; however, 33 percent indicated net income was still somewhat or substantially above the 5-year average.

Our Survey Respondents

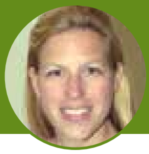
As might be expected, those responding to this survey closely match Farm Credit East's customer demographics:

- 55 percent were from New York State, nine percent from New Jersey and 36 percent from the five New England states in Farm Credit East's territory.
- Dairy was the largest farm product with 36 percent, followed by cash grains with 11 percent, hay and fresh market vegetables at 10 percent and a variety of other enterprises comprising the rest of the respondents.
- The majority of respondents were from a full time family farm (67 percent). Large commercial businesses and part-time farms were each 11 percent and forest products/timber represented five percent of the sample. The remaining six percent were from other types of operations.
- Operators over 55 years of age accounted for 33 percent of responses, with those between 35 and 55 years old representing 50 percent of participants and 17 percent were less than 35 years.
- 86 percent of respondents were male and 14 percent were female.

About the Survey

The survey was open to any farm, fishing or forestry producer operating within the seven states served by Farm Credit East, ACA. It was conducted as an internet survey and promoted in a variety of ways – email, postings on our website and through various social media networks. The survey was open for response during the month of December 2016 and early January 2017. It is not purported to be a scientific random sample; however, it is believed to be a reasonable insight into the perspectives of a significant cross section of Northeast producers.

MANAGING IN CHALLENGING TIMES

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We have seen many agricultural industries face challenging times before. We may attribute a challenging period to cycles that are part of the "normal" variations in supply and demand. Difficult market conditions, however, might indicate the beginning of a "new normal" — or an industry reset. Grains, soybeans and cranberries are in a period of low prices and it could be years until prices return to their historical highs.

As a business owner, it can be tempting to assume a downturn will end and that markets will improve. Producers who embrace the possibility of an industry reset and adjust their businesses to changed realities will be better prepared for continuing success.

We recently polled a few seasoned consulting staff about how they are advising the producers with whom they work. They provided valuable feedback about managing and financing during stressed times. Some comments overlap, as management practices have implications for financing the business, and vice versa. However, an overarching theme is that waiting for a highly profitable year to recover finances is not a viable strategy.

Management

1. **UNDERSTAND AND MANAGE YOUR NET COST OF PRODUCTION.**
   Accurate financial records to calculate cost of production is paramount. Then benchmarking your NCOP against industry standards indicates areas for improvement.
2. **"WE'VE ALWAYS DONE IT THAT WAY."**
   This is a good time to rethink the rationale within your business strategy. This may include evaluating the financial impact of doing it all yourself or aiming for maximum production rather than for optimal cost of production per unit.
3. **MAKE THE MOST OF UNDERPERFORMING RESOURCES.**
   Businesses often accumulate underperforming resources during periods of good profitability. It makes sense to either enhance the performance of these resources or let them go in tougher times. This may include rented crop land that made sense to operate when corn was $6 per bushel. It may be an employee or two that are nice to have during peak times, but increase labor cost above the norm. If circumstances require you to hold onto that resource, find a way for that acre or employee to be of more value.
4. **UPDATE YOUR "RECIPES" FOR CURRENT CIRCUMSTANCES.**
   When commodity prices were high, many producers developed production input recipes that maximized production in order to maximize income. Examples include therapeutic fungicide applications and nutrient supplements that added small incremental advantages. Under current commodity prices, the benefit of these practices may not be greater than the costs. Work with your trusted advisors to develop a production recipe that is relevant to today's commodity prices.
5. **RE-BALANCE YOUR OPERATION.**
   Operations may have undertaken expansion during highly profitable years. Often, key resources can get out of balance due to the stepwise nature of expansion, such that one or two resources may be in excess while others are limited. It is important to understand and manage any imbalance within your operation.
6. **EFFICIENCY IS KEY.**
   High prices in the past decade may have led to creation of some inefficiencies in our production systems. For commodities facing the reality of lower gross income, efficiency of production, as well as having an efficient infrastructure, is absolutely critical to maximize your bottom line. Review all of the technology and production practices adopted during the upswing. Do they all still make sense in this new era of tighter production margins? Similarly, prioritize future capital investments into areas that will improve your efficiency of production.
7. **TAKE FULL ADVANTAGE OF OUTSIDE PROFESSIONAL ADVISORS.**
   There are outside resources that are eager to assist you in taking bold action and achieving a more competitive cost of production — your production advisors, suppliers and Farm Credit

East's team of financial experts, including consultants and loan officers. We urge you to take full advantage of these professionals because they bring not only expertise, but perspective from working with similar farm businesses. Farm Credit East staff looks forward to being a member of your operation's "team of experts."

8. **ESSENTIAL VS. "NICE TO HAVE" CAPITAL SPENDING.**
Healthy profits and strong appetite for income tax management may have spurred increased capital spending for replacement machinery and technology. Younger family members may not remember a time when the business needed disciplined capital spending. Farm Credit East recognizes that with today's level of mechanization and technology, there is almost always some essential capital spending required in ag businesses. We strongly recommend setting a multi-year capital budget based on expected obsolescence and priorities, and then using it to maintain strong discipline when opportunities crop up.

9. **FAMILY LIVING WITHDRAWALS FROM THE BUSINESS.**
It's wise to examine family living draws in light of current levels of profitability.

10. **ACCURATE, REAL-TIME FINANCIAL RECORDS.**
As we have observed the speed and success of ag businesses who take bold action, a common factor is accurate, real-time financial information on a monthly and annual basis to be used for monitoring, benchmarking, partial budgeting and motivation. This is a critical survival skill whether you use Farm Credit East's services, or another professional practitioner.

Financial & Credit Management

1. **PRESERVE YOUR REMAINING DEBT CAPACITY.**
Credit availability is a critical resource to help you through an agricultural cycle. Resist the temptation to use available lines of credit for anything other than essential replacement purchases and meeting current operating expenses. Be cautious about "deferred financing" or leasing of "nice to have" pieces of equipment.

2. **DE-LEVER YOUR BALANCE SHEET.**
This is needed for sustained success over the long-term. The right amount of debt and leverage on the balance sheet is specific to each operation. Your Farm Credit East loan officer can help you analyze this. The next three strategies can assist in de-levering.

3. **SELL UNPRODUCTIVE ASSETS.**
Consider selling assets that are not essential to your operation:

   » Houses on land that you have purchased over the years that could be sub-divided without unduly impacting the cropland.

   » An old piece of machinery not needed to keep existing facilities in full production.

   » Merchantable timber that the local logger has been soliciting.

> **"Waiting for a highly profitable year to recover finances is not a viable strategy."**

4. **REPAYMENT: TIME IS NOT A "SILVER BULLET."**
Lengthening the debt term or terming out operating losses over an extended period can improve cash flow, however, an operation places itself in an uncompetitive position if it is still making payments on depreciated assets or past operating losses. Needing to term out a current operating loss over five or more years shows the business's lack of resilience and likely inability to weather future downturns.

5. **EQUITY INVESTMENT.**
Traditionally, we have not seen much outside equity investment in Northeast agriculture. Today's entity structures may better facilitate outside equity than in the past, especially for more profitable farms that have a present need to reduce leverage.

6. **KEEP YOUR "PLAN B" IN MIND.**
It's important to have a Plan B if bold actions do not result in sustainable profits. Being strategic and proactive about selling assets is important, especially if a prolonged downturn impairs asset values or the purchasing power of likely buyers.

7. **IS THIS THE RIGHT TIME TO EXIT?**
Over many decades, many families have determined that their best strategy was to make a planned exit in a manner that preserved their accumulated family wealth. Almost universally, these folks tell us later that they are glad that they made this decision and that life after exit was productive and enjoyable. The key to this decision is to not wait until equity is mostly gone and to sell assets in a manner that manages the income tax liability. Farm Credit East loan officers and tax consultants can help.

8. **TALK OFTEN WITH YOUR LOAN OFFICER.**
Farm Credit East has a shared interest and commitment to the future success of Northeast agriculture, forest products and commercial fishing. Ongoing, honest communication about financial needs and outcomes is more critical than ever to best serve you.

Call to Action

An industry reset can create difficult circumstances for some producers. Low cost producers will continue to make money, just not as much. Average managers will be continually challenged, and high cost producers will be under even more pressure to either fundamentally improve or exit the industry.

Yet, a challenge can also bring opportunity. Many ag businesses position themselves well to succeed under expected industry conditions. Many others aren't far behind, and the opportunity to make adjustments to help them succeed is well within their grasp. The window of opportunity to make changes does not remain open indefinitely. It's critical for producers to make an honest assessment of their operations and take necessary bold action for continued success.

Article coordinated by Heather Hunt, Farm Credit East Knowledge Exchange and Communications Specialist

BUSINESS ENTITY TRENDS *from a* TAX AND SUCCESSION PERSPECTIVE

DARIO AREZZO
Tax Consultant
Farm Credit East

As estate and succession planning comes to fruition for many Northeast farms, the conversation often turns to the best method of dealing with partnership interests. Once the decision is made for a partner to exit the farming operation, the remaining partners will typically traverse down one of two paths. They will either decide to purchase the exiting partner's interest on a pro-rata basis, or they will decide that the partnership will redeem the exiting partner's interest. Often times, if proper planning has been done, the partnership operating agreement will spell out the rules of the road regarding what method is employed.

When farmers meet with us, they are often surprised to learn that while either fork in the road will lead to the same result, the tax implications are very different.

Case Study

Let's assume that Farm, LLC has three members: Alice, Billy and Charlie. Each of the three members is a 33 percent owner of the capital and profits of Farm, LLC.

ASSETS

	Tax Basis	Cost	Fair Market Value
Land	$1,200	$1,200	$2,700
Accounts Receivable	$0	$0	$800
Milking Parlor	$400	$1,600	$1,600
Raised Cows	$0	$0	$300
Barn	$200	$900	$900
Total	**$1,800**	**$3,700**	**$6,300**

LIABILITIES AND OWNER'S EQUITY

LIABILITIES $0

EQUITY

	Tax Basis	Cost	Fair Market Value
A	$600	$1,233	$2,100
B	$600	$1,233	$2,100
C	$600	$1,233	$2,100
Total	**$1,800**	**$3,700**	**$6,300**

If Alice and Billy decide to equally purchase Charlie's interest for $2,100 cash (the value of his 1/3 share), then Charlie would have gain on the sale calculated as follows:

CASH PAID	$2,100
CHARLIE'S BASIS	-$ 600
TOTAL GAIN	$1,500

When Charlie sells his partnership interest, to determine the character of the gain, we must "look through" to the partnership's underlying assets. In Charlie's case, since he is a 33 percent owner, his share of the partnership's ordinary income (i.e. accounts receivable and depreciation recapture on the milking parlor) would be ordinary income. The accounts receivable is an ordinary income item because as that money comes in, it is treated as ordinary farm income. Additionally, because the farm received depreciation deductions (which lowered farm taxable income) on the milking parlor, any income up to the original price would be ordinary income. General purpose barns are treated differently under the depreciation tax rules that we won't get into here, but the recapture portion is generally taxed at 25 percent. In this case, Charlie's share of the barn recapture ($233) would be subject to the 25 percent tax rate.

To breakdown Charlie's $1,500 gain from the sale of his interest, it would look as follows:

TOTAL GAIN	$1,500
CAPITAL GAIN	$ 600
ORDINARY GAIN[1]	$ 667
25% GAIN	$ 233

As a result of the $1,500 gain, the remaining partners are permitted a "step up" of $1,500 on the partnership assets that will yield immediate benefits to the partnership. Looking at the milking parlor recapture as an example ($400), the business will increase the basis of that asset through an adjustment on the tax return which will provide for further depreciation deductions.

The phase "retiring partner" is often thrown around by tax professionals to refer to the redemption of a partner's interest. It is important to note here that this does not mean that a partner must retire in order to utilize this feature. Any time a partner leaves the partnership and is redeemed, this provision may be utilized. When reviewing this situation with a prospective "retiring partner," Farm Credit East tax consultants will compare this sales treatment to a partnership redemption to ensure that all the options are known to the parties.

So what are some of the tax consequences above that would change if this transaction were structured as a redemption?

- Often times for liquidity reasons, farm operations will purchase a partner's interest over time. In these installment sales, the "hot asset" income above must occur immediately, even if the partner doesn't receive enough cash to cover the taxes on day one. For example, the $667 worth of "hot asset" gain would be reported in the year of sale regardless if only $100 was actually paid. With a redemption, the recapture gain only becomes taxable as payments are made.
- There is no imputed interest required to be paid on a redemption.
- Additionally, there is no 25 percent recapture on the buildings during a redemption for the seller.
- An important consideration that arises with respect to the redemption is the fact that the partner selling out is technically, for tax purposes, still a partner in the partnership. From a credit standpoint, there are many issues that must be discussed with the loan officer in these cases. Some of these questions include how these payments affect borrowing capacity, whether or not the exiting partner will remain liable for the debt outstanding and whether or not that partner decides to sign on any new debt while they are being redeemed.
- Lastly, the "step up" of the assets from the gain to the retiring partner is recognized only as payments are made and not all up front.

Conclusion

This is a very broad overview of a complicated transaction. The decision for a farmer to exit the partnership is a personal decision that is made for various reasons along the estate and succession planning road. The "tail should never wag the dog" in the sense of tax decisions driving the ultimate business goals. However, once the decision to exit from a partnership is made, Farm Credit East tax consultants will ensure that the partners know what implications will flow from either a sale or a redemption of that retiring partner's interest while closely working with their loan officer to ensure liquidity concerns are addressed. ◆

[1] "Hot assets" — 33 percent share of the accounts receivable gain ($267) plus 33 percent of the parlor recapture gain $(400).

WHO are your customers?

SOPHIE WINTER, PH.D.
SUNY Cobleskill

If the State of New York were isolated from the rest of the country, the food that it takes to feed its 20 million residents would have to come from the 36,000 farms that dot the state's landscape. On average, that would mean that each farm would need to produce enough to feed 555 consumers.

Now we know that this is not the case and that New Yorkers enjoy the benefits of a transcontinental North American food system, but it is in fact true that the number of people being fed by each individual farm in the U.S. increases each year. An increasing population and declining farm numbers mean that American farmers each feed about 155 people. In 1850, when nearly everyone was a farmer, each only needed to feed four.

With increases in production efficiency and year-over-year improvements in equipment and other technologies, today's American farm is truly a sophisticated enterprise, made even more so by the modern need to incorporate product preferences and buying behavior of well more than four people into production decisions. Exploring aggregate global trends in food consumption is now crucial for allocating land and other resources among competing crop, livestock and dairy outputs.

The largest living generation is now the Millennials (born between roughly 1980 and 2000, numbering over 75 million). They are now 18-34 years old – that critical timeframe in which lifelong eating, exercise and other behavioral habits are usually established.

These young people grew up in an environment in which more than two thirds of adults are overweight or obese and this has translated into a more pronounced interest in healthy eating than in any other generation. They are "glued" to their phones and are using those tools to get answers to nutrition-related questions. Indeed, Google reported that web searches for food and nutrition-related questions

REFERENCES:

Google Trends, January 2016 vs. January 2005, U.S.

Surfec, Lyssa., (2008), AgriMarketing, "About the Rural Lifestyler"

Hayes, Matt., (2016), Cornell Chronicle, "Digital agriculture report looks to data driven future"

are on the rise and 35 percent of them are done through a smartphone.

These hand-held encyclopedias are sitting on every dining room table in the country; grandma's cookbooks and medical dictionaries are gone in favor of YouTube and blogs. Data on internet searches for health and food-related items reveal the following: "best foods for acid reflux" saw a 925 percent increase in searches from 2011 to 2015; "upset stomach" as a search term increased by 321 percent; functional foods are buzzing on the internet and turmeric, kefir and probiotics are definitely the winners of the web popularity contest (Google Trends, 2016). Brands and food companies are responding by "healthifying" their products and are adding chia seeds here or flax seeds there to satisfy consumer demand.

Millennials are truly hungry for information and data, and as a result, food labels are getting more and more confusing: heirloom, grass fed, cage free, all natural, organic, free range, local... every consumer wants something that speaks to their interest in healthy living, but what does that mean?

Beyond technology, they turn to the agricultural world to find their answers and try to educate themselves by visiting open farm days. They love farm tours, u-pick sites, farm stores, barn weddings and the like. Agri-tourism is on the rise and this is our opportunity as an industry to educate consumers.

More often than not, consumers run into what we could call "rural lifestylers," the majority of farmers in the United States who earn less than $10,000 per year in farm income and have primary off-farm jobs (Surface, 2008). These farmers are typically active in their communities and their role in consumer education is indisputable.

However, they have learned over time that for the sake of their business ventures, listening to the consumer is just as important as educating them. It is increasingly crucial that larger commercial farmers tap into consumer thinking as much as their smaller counterparts have because rapidly changing eating trends (made even more rapid by constant and immediate access to information) WILL ultimately dictate what we produce on farms across the country.

In short, the farmer who clearly understands the importance of production-oriented data in their daily operations must complete the circle and incorporate consumer-level data into decision-making (Hayes, 2016). For sure, the Millennials eating the food they produce are already incorporating data about farms and farming into their consumption decisions. Bridging the disconnect between them and the 57 year-old farmer (on average) will certainly be a big challenge of 2017.

> **"An increasing population and declining farm numbers mean that American farmers each feed about 155 people.**
>
> **In 1850, when nearly everyone was a farmer, each only needed to feed four."**

GRAIN & OUT

PATRICK WESTHOFF, PH.D.

Food and Agricultural Policy Research Institute, University of Missouri

A wide range of factors affect crop prices, but for the last seven years, a single indicator has been all you needed to know to predict whether prices would increase or decrease.

The indicator is a comparison of global average grain and oilseed yields to the long-term trend. The yield is calculated from USDA data for 14 crops — corn, wheat, rice, soybeans, sorghum, barley, oats, millet, rye, mixed grains, rapeseed, sunflower seed, peanuts and cottonseed. The trend yield is a simple linear trend over the 1980-2015 period (Figure 1).

Every single time between 2009 and 2015 that the world average yield exceeded the long-term trend, U.S. marketing year average prices for corn, soybeans and wheat declined from the previous year. The average yield was above the trend in 2009, 2013, 2014 and 2015, and prices fell for all three major crops in the 2009/10, 2013/14, 2014/15 and 2015/16 marketing years (Figure 2).

Similarly, every time that the world average yield was at or below the long-term trend, prices rose. Yields were at or below the trend in 2010, 2011 and 2012, and prices rose from the previous year in 2010/11, 2011/12 and 2012/13.

It appears nearly certain that the global average grain and oilseed yield has

& OILSEED
LOOK

exceeded the long-term trend for the fourth straight year in 2016. Based on year-to-date prices in December 2016, it appears likely that wheat and corn prices will be lower for the 2016/17 marketing year than in 2015/16. In an exception to the rule, soybean prices were up slightly from the previous year. Of course, in December 2016, the size of the early 2017 South American harvest was not yet known.

Such a neat relationship between world yields and U.S. prices does not always hold, but it does provide a reminder of a very simple fact — weather and other factors that affect yields are very important to crop markets. Looking ahead, if global yields were to decline to, or below, the long-term trend in 2017, it might help reduce the large stocks that are putting downward pressure on world prices. Given the magnitude of those stocks, however, it could take a large drought in a major production region to get a quick recovery in prices.

Of course, it isn't just weather that determines crop supplies. Over time, low prices might cause some farmers around the world to scale back expansion plans or reduce use of yield-enhancing inputs. Between 2002 and 2014, the world's farmers increased the area harvested for the four main crops (corn, wheat, rice and soybeans) by 100 million hectares—that's

247 million acres, the equivalent of total U.S. acreage devoted to corn, soybeans, wheat, cotton and sorghum. That sort of rapid expansion is much less likely when prices are as low as they are today.

On the demand side of the picture, population growth is obviously an important factor driving food consumption, but population growth is slowing. Per-capita use of grains and oilseeds has increased sharply since 2002, and if that growth continues or accelerates, the result could be higher prices than we observe today. If rising incomes cause dietary changes that result in more meat and dairy consumption, for example, the world will need more feed for livestock rations.

Just two factors explain most of the entire net increase in world grain and oilseed use per capita since 1980: U.S. biofuels and increased consumption in China. Unfortunately for crop producers, it appears that growth in U.S. biofuel production has slowed dramatically since 2010, and it would take a major change in policy or in petroleum markets for that story to change.

That leaves China. China's demand for soybeans and other grains and oilseeds has outpaced growth in Chinese crop production in recent years (Figure 3). We expect further expansion in Chinese livestock production and feed demand as Chinese diets change, but the recent rate of growth cannot continue forever. Eventually, Chinese diets will include as much meat and fish as western diets.

Of course, there will always be wild cards. Will a new "engine" of demand growth emerge to supplement China and biofuels? How will the farm and trade policies of the new Administration affect markets? Will some major geopolitical event re-order the agricultural trading system? Barring a major market surprise, however, farmers should recognize that crop prices are likely to remain well below the 2010-13 peak levels for quite some time.

WORLD GRAIN AND OILSEED YIELDS. CALCULATED FROM NOVEMBER 2016 USDA DATA

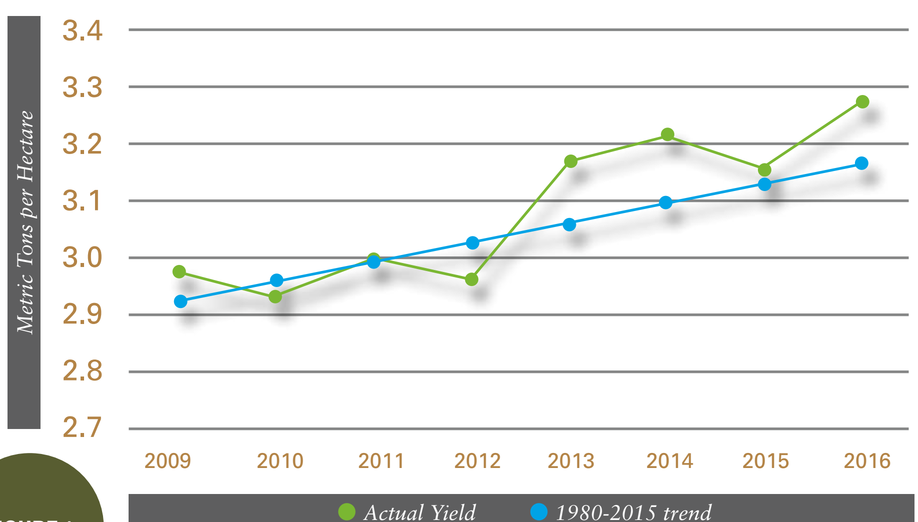


FIGURE 1

U.S. GRAIN AND OILSEED MARKETING YEAR AVERAGE PRICES. DECEMBER 2016 USDA DATA

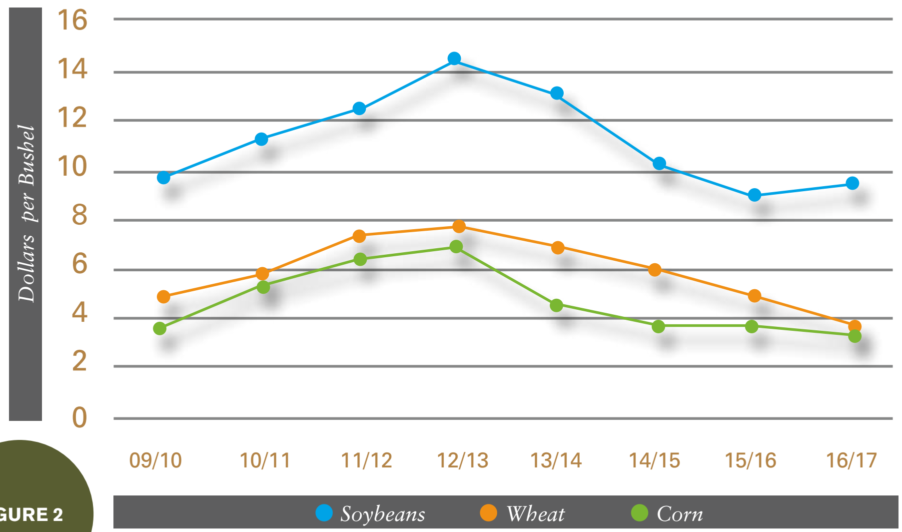


FIGURE 2

CHINA'S GRAIN AND OILSEED PRODUCTION AND USE. CALCULATED FROM NOVEMBER 2016 USDA DATA

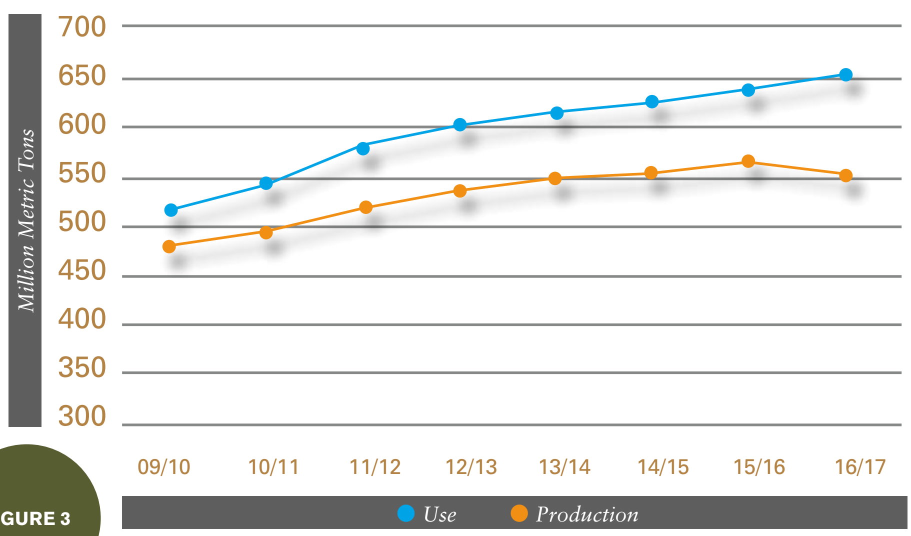
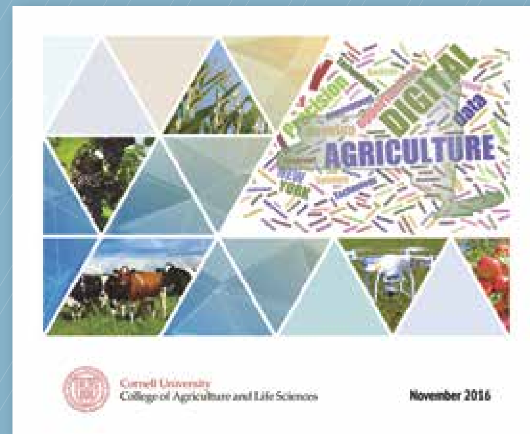


FIGURE 3

OPPORTUNITIES IN DIGITAL AGRICULTURE FOR THE NORTHEAST



HAROLD VAN ES, PH.D.
JOSHUA WOODARD, PH.D.
Cornell University

Like other economic activities, agriculture is increasingly affected by the digital revolution, and we are now on the threshold of a significant transformation of the industry.

DIGITAL AGRICULTURE refers to the employment of computational and information technologies and offers new opportunities through the ubiquitous availability of highly interconnected and data-intensive tools as part of the so-called "Fourth Industrial Revolution." It applies to all crop and livestock systems in that it reflects a shift from generalized management of farm resources towards highly optimized, individualized, real-time, hyper-connected and data-driven management. The desired outcomes of leveraging digital agriculture are more profitable and sustainable production systems.

We were asked to develop a vision document for digital agriculture in New York State. As part of the mandate, agricultural producers were engaged to assess adoption of new technologies and to identify challenges and recommendations to advance digital agriculture. We organized a workshop with farmers and agri-businesses, performed a statewide survey, did a literature analysis, and studied current and evolving trends in digital agriculture. Our report can be accessed at bit.ly/NYSDigitalAgReport.

Technologies

The technologies that enable digital agriculture are multiple and varied, and are inclusive of conventional precision agriculture tools, as well as computational and sensing tools that are yet to be developed. Production efficiencies can be gained from the integration of data associated with multiple technologies and the real-time transfer of data and information between field equipment, barn, office and the Cloud.

Data analytics and telematics (the long-distance transfer of digital information) are key to achieving the benefits from digital agriculture. The main enabling tools that exist today include sensors, digital controllers, digital communication (cellular, broadband and others) and computational decision tools. Field-based activities are also enabled by geo-locationing (GPS), geographical information systems (GIS), yield monitors, precision soil sampling, proximal and remote sensing, unmanned aerial vehicles, variable rate technologies, auto-steer, guidance, and robotics. Livestock-specific technologies include radio frequency identification, automatic milking systems and electronic feeding systems, among others.

Assessing Needs for Digital Agriculture

Our farmer survey suggested several interventions for improving digital agriculture adoption. A recurring theme of both the workshop and the survey was the large current analytics and data management gap relative to the capabilities of modern-day equipment, uncertainty about technology benefits and inadequate digital connectivity. 34 percent of respondents indicated insufficient technical support, while 51 percent reported that they are uncertain of how to implement new technologies in a profitable manner.

Agriculture is following other industry sectors in that the benefits from digital technologies are the primary source of increased production efficiencies. In a global economic environment, our regional agriculture's competiveness is strongly tied to its ability to innovate in these key aspects of the production system. But digital agriculture will also create a digital divide in the farming community. Therefore, this adoption process needs to be supported in an environment that allows the entire farming community to fully capitalize on the production efficiency gains.

Opportunities, Challenges and Recommendations for Digital Agriculture

By seizing opportunities and overcoming barriers, regional technology companies, farmers and public institutions can help lead our agricultural industry into the digital age, while foregoing these opportunities will negatively impact the industry's global competitiveness. We determined that connectivity limits the effective employment of digital agriculture technologies in many rural areas. Generally, needs exist around (i) expanding broadband access; (ii) improving cellular coverage and data transmission speeds for proper uploading and downloading of data; (iii) establishing low-power wide area networks to support sensor technology and equipment communication through the so-called "Internet of Things"; and (iv) universal access to Real-Time Kinematic (RTK) technology in rural areas, a technique used to reduce and remove common positioning errors which makes machine control possible.

Concerns with data tend to focus around security and privacy, the use of such data by private companies to advance their own rather than public interests, as well as farmer ability to employ their own data to improve management and profitability.

In order to advance digital agriculture, educational issues need to be addressed at multiple levels related to (i) farmer knowledge on the use and economics of the technologies, (ii) training of professional service providers and educators, and (iii) undergraduate and graduate training for the next generation professionals.

For research, opportunities and concerns center on (i) farm data availability for analytics, (ii) highly innovative research initiatives and the development of new management recommendations, and (iii) partnerships between the research-extension community and private sector companies. We also believe that there is a need for a public-sector data center infrastructure that allows for the secure collection, curation and analysis of farm data, with appropriate consent, privacy and security considerations. The data would be stored for farmer benefit and also become available for aggregate and anonymized analytics and the development of a new generation of management recommendations.

In summary, digital agriculture offers exciting prospects for our region's agriculture, including field crops, specialty crops, livestock and even organic production. The broader industry and the associated public support infrastructure needs to adapt to this new paradigm in order to capitalize on these opportunities.

Invest in LEADERSHIP DEVELOPMENT for Future Competitive Advantage

Well-designed leadership development experiences can build both human and social capital, and those resources offer Northeast agribusinesses a source of competitive advantage in a rapidly changing marketplace.

To understand why, we should take a look at the nuances and interrelationships of various forms of capital.

LARRY VAN DE VALK, PH.D.
Executive Director, LEAD New York

Human Capital

One way to think about human capital is to think about the talent or skills that individuals bring to their organization or community. For example, a given individual may have specific, creative skills that allow them to develop effective social media marketing campaigns for their employer. Someone else might be very talented at recruiting, hiring and training new employees. Still another might be knowledgeable about the political process and how to affect public policy.

It is relatively easy to grasp the connection between human capital development and training. Do you have an employee that needs to work on their public speaking and presentation skills? Sign them up for a communications course. Have a manager that needs to learn how to run a better staff meeting? There's a seminar or workshop for that. Many leadership competencies can be improved through appropriate training activities. In the case of many comprehensive leadership development programs, the curriculum may address a number of different skills, and individual improvement is often dramatic.

LEAD New York is one such program. In the first year of the program – called Leadership Fundamentals – participants develop critical skills for effective leadership, like public speaking, debate and conflict management skills. In the second year of the program – called LEAD Fellows – participants take a broader look at government, trade, food policy and other global issues influencing the food and agribusiness sector.

One recent LEAD New York graduate opined "My LEADNY experience influenced my approach to business management more than my four-year college degree in agriculture." A former state secretary of agriculture offered: "In my role, I attend a lot of industry meetings. I can always tell who the LEADNY graduates are in the room because they listen more effectively, ask better questions and generally think more strategically than others." And the CEO of a large Northeast agricultural cooperative shared that when hiring to fill key management positions, LEADNY applicants "…typically surface to the top of the applicant pile."

As these testimonials suggest, this particular leadership development experience does indeed improve human capital, and recent national evaluation data of similar statewide, agricultural leadership development programs supports that assertion. In a 2014 evaluation study[1], nearly three quarters of alumni respondents said that participation in their respective leadership development program positively impacted their work, with many participants moving from non-supervisory employment into managerial, administrative or ownership roles. Furthermore, nearly 90 percent of alumni said they began serving in additional leadership roles since graduating – sometimes in their company, but also in their communities – and most serve in three to five different leadership roles, including cooperative governance and local elected positions.

Social Capital

Let's assume you work for a large organization, and someone there is really good at social media marketing. Or perhaps there is someone in your community that is really good at fundraising for civic causes. What good are those resources if you aren't even aware that they exist? How would you leverage those skills to your benefit if you don't even know who to reach out to? That is the point of social capital.

[1] Lamm, K. W. & Carter, H. S. (2014). International Association of Programs for Agricultural Leaders Organization Evaluation. Gainesville, FL: University of Florida.

[2] Granovetter, M. S. (1973). The Strength of Weak Ties. American Journal of Sociology, (78) 6. The University of Chicago Press.

[3] Galli, E. B. & Muller-Stewens, G. (2012). How to Build Social Capital with Leadership Development: Lessons from an Explorative Case Study of a Multibusiness Firm. The Leadership Quarterly, (23). Elsevier.

Think of social capital as the connections between people that share common interests, norms of behavior and reciprocity, and mutual trust. Social capital is often thought of as the 'grease' in the social machine, which allows other forms of capital (human, political, financial, etc.) to be effectively utilized. Structurally, social capital is often represented by social networks, and "networking" has long been identified as the primary beneficial outcome of participating in programs like LEADNY.

Social networks usually have both bonding and bridging ties. Bonding ties are strong relationships between individuals – think of your family members or your closest friends – those people you would reach out to when you are having a traumatic life experience, for example. Bridging ties are usually weaker – think about people you meet at a conference or in a leadership development program – but can be incredibly valuable nonetheless. "Bonding ties are those that get you by [e.g. when the chips are down]," said Mark Granovetter in his famous *Strength of Weak Ties* article[2], "but bridging ties are the ones that will get you ahead."

In other words, those loose connections you make – quite possibly in a leadership development program – are often the very connections that will be most beneficial to you in forming a new business partnership, identifying a new market for your product, finding that new key employee, and so on. Forming relationships outside of your traditional network (or 'silo') – even if those relationships are within your own company – is often a key competitive advantage[3], because you know who to contact to obtain some resource when others do not.

Invest in Leadership Development

We have all heard the statistics about the aging of the agricultural sector, particularly in the Northeast. As farm and agribusiness owners approach retirement age, it is now more important than ever that we develop the next generation of agribusiness leaders. Leadership development programs present an excellent opportunity to not only develop the skills of aspiring young leaders (human capital), but also to help them build the networks they will need to advance their businesses and industry associations (social capital).

In this article, I have offered examples drawn primarily from LEADNY (www.leadny.org), but there are numerous other leadership development opportunities for Northeast agribusinesses. Some are sector specific, like Cornell's Dairy Executive Program. Others target certain audiences, like Farm Credit East's GenerationNext Program, the Northeast Cooperative Council's Young Cooperators Program, or Farm Bureau's Young Farmers and Ranchers Programs. And there are statewide programs similar to LEADNY in New Jersey, Pennsylvania and Maryland, to name a few. Regardless of the specific opportunity you choose to pursue, making a strategic investment in the development of your next generation leaders will likely pay dividends in the future! ♦

LEAD New York

is a leadership development program for adult professionals in the food, agriculture and natural resource industries, based at Cornell University. Leadership Fundamentals, the first year curriculum, develops participants' leadership skills, networks, and familiarity with the breadth of industry sectors and issues represented in the Northeast. Successful completion of Leadership Fundamentals prepares graduates to serve in a number of local leadership roles. LEAD Fellows, in the second year of the program, travel extensively to broaden their understanding of food policy, environmental issues, international trade and other global issues facing our industry.

LEAD Fellows develop a broader perspective, critical thinking and analysis skills that serve them well in a number of significant leadership roles.

MILK PRICE RECOVERY 2017

MARK STEPHENSON, PH.D.
Director of Dairy Policy Analysis, University of Wisconsin

Let me give you the bottom line first and then I'll tell you why... I think that farm milk prices will be up about $2.00 per hundredweight in 2017 over 2016.

We hit the bottom of the milk price cycle in May of 2016 and we have been in recovery mode since that time. Our recovery has not been explosive, but it has been steady and I think we can count on that continuing for the first three quarters of 2017. Maybe after that prices could increase more aggressively, but there is a possibility that the recovery could be at the next high by then too. It largely depends on what is happening outside our borders.

There have been many reasons why the last couple of years have given us low milk prices, but the simple reason is that worldwide demand for dairy products did not grow as fast as milk production did. China's economy still has enviable growth, but it is slower than the last decade. As an oil exporting country, Russia's economy is suffering from the effects of low prices for petroleum as well as economic sanctions imposed upon them for political reasons. These two countries had been the two largest importers of dairy products in the world.

The world's largest exporters include the European Union, New Zealand, the United States and Australia. Normally, farm milk prices in these countries are fairly similar. This would be expected because if it differed by more than the cost of transportation – we would expect dairy product buyers to source their purchases from a less expensive supplier. However, in 2016 the U.S. has averaged an all milk price of about $17.50, while EU producers have had prices in the $14 range and New Zealand farmers have spent much of the production season around $10 — a much larger price spread than is normal.

This price difference was supported because New Zealand did not have any recourse but to drop prices to the point that milk production was discouraged and export sales could be found. And the European Union began with market intervention that purchased a fair amount of powder until that program hit its limits. The EU subsequently tried a new program of payments to producers that voluntarily decreased their milk production.

U.S. milk prices have not been great, but they have been good enough to support an increase in milk production throughout the year. California has been a notable exception, with a strong reaction to poor margins and declining milk production for most of the last two years.

You can see from the graph that milk production in New Zealand, the European Union and Australia are all below year earlier levels and that the United States milk production growth, while positive, has not been enough to offset losses in the other exporting countries. World prices for milk began moving up when dairy buyers around the world thought that prices were at their lowest and made some bargain purchases. Right now, we are drawing down excess world stocks of dairy products and that is helping to sustain the steady rise in prices. If, or when, we get to the point that world buyers are concerned that world stocks are getting tight, we may see more dramatic increases in milk prices.

As farm milk prices improve around the world, milk producers will begin to think that it is time to increase production. The key to the question of whether we see very rapid increases in farm milk prices or not, is how producers respond to improved incomes — gradually or with much more milk. Much more milk would mean that our rise in milk prices is done.

I think that price improvement will be sustained for most of 2017. First of all, southern hemisphere producers (New Zealand, Australia, Argentina and others) are on the back side of their seasonal lactation cycles. It won't be possible for them to react until the next calving season begins in July and August.

The EU will be involved in their voluntary milk reduction through March of 2017 and individual countries of the EU are facing other constraints. For example, Dutch dairy farmers have been issued phosphate rights based on the number of cows they had in July of 2015. The implication is that they may have to reduce their national herd by more than 100,000 cows to meet the limits. Farmers in other countries of the EU began breeding dairy cows to beef bulls when they perceived milk returns to be quite low and this will limit herd replacements over the next couple of years.

We will have to keep an eye on the rest of the milk exporting countries over the next year to see how they respond to improving farm margins, but I think that it is likely that our milk price improvement will be sustained and maybe even yield much higher prices by the end of 2017.

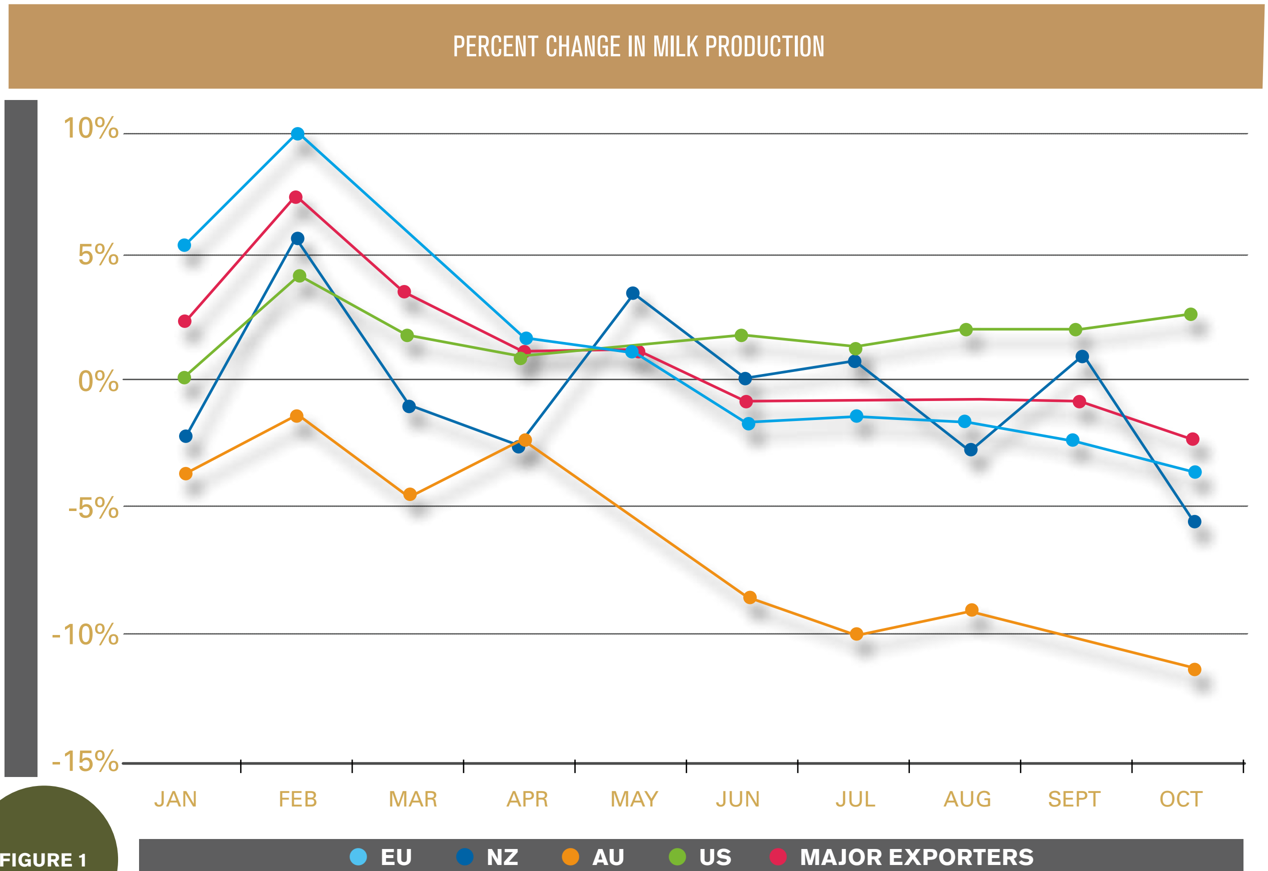
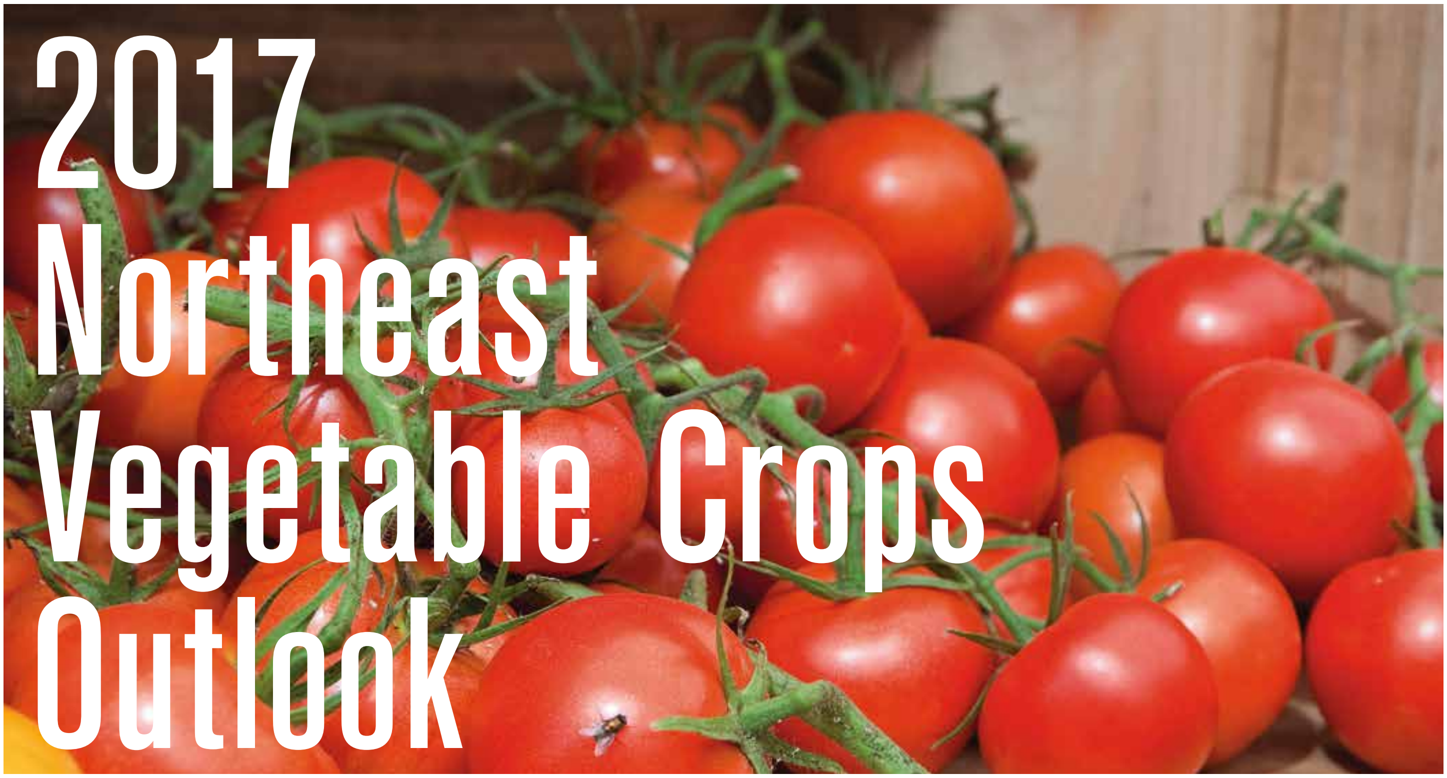

PERCENT CHANGE IN MILK PRODUCTION
10%
5%
0%
-5%
-10%
-15%
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEPT
OCT
EU
NZ
AU
US
MAJOR EXPORTERS

FIGURE 1


The simple reason is that worldwide demand for dairy products did not grow as fast as milk production did.



2017 Northeast Vegetable Crops Outlook

STEVE REINERS, PH.D.

Chair, Horticulture Section, School of Integrative Plant Science, Cornell University

Vegetables are an important part of the agricultural profile in the northeast. Stretching from Maine to New York and New Jersey, fresh market vegetables are grown on about 100,000 acres and worth about a half billion dollars. New York and New Jersey account for about 90 percent of the acres and value. Additionally, New York includes about 40,000 acres of processing vegetables and New Jersey 4,000 acres, worth $40 and $4 million, respectively.

The 2017 outlook is filled with uncertainty, as growers have concerns about the impact of President Trump's immigration policies on agricultural labor. Mr. Trump has promised to deport up to three million illegal immigrants. A report commissioned by the American Farm Bureau in 2014 estimates that if undocumented workers are deported and borders sealed, vegetable production will decline 15 to 30 percent. Growers would welcome an effective guest worker program, but the uncertainty of next year's labor force may impact cropping decisions.

Besides labor, growers have concerns over the high cost of doing business in the northeast. Taxes, energy prices and regulatory costs add expenses. With the exception of New Hampshire, all Northeast states have a higher minimum wage than the federal minimum. New York and Massachusetts will see an $11 per hour wage this year, while others are close behind. Competing states like Texas, Georgia and North Carolina, use the federal minimum, while Florida's is slightly higher. Additionally, overtime rules are being rewritten in New York, which could further raise labor costs.

In 2017, Northeast growers will be dealing with the impact of the Food Safety Modernization Act (FSMA). New requirements call for food safety plans, grower trainings, inspections and better monitoring of products from field to fork. Although exemptions exist for small- and moderate-sized operations, wholesale buyers may demand growers follow these rules. Growers should contact their local extension office and inquire what may be required of their farms and if local trainings are available.

Although labor availability may be the greatest threat to vegetable growers, a potential upside of Mr. Trump's policies could be reassessing trade deals that negatively impact U.S. vegetable and fruit

> **Consumers are increasingly supporting local farms, through sales at roadside stands and farmers' markets, or at supermarkets and restaurants that are marketing locally produced commodities.**

growers. While U.S. agriculture overall benefits greatly from international trade, some more labor-intensive sectors find themselves at a disadvantage.

Since NAFTA was passed in the mid 1990's, the U.S. has become a net importer of fruits and vegetables, with imports two to three times that of exports in 2015. Some of this is due to increased demand for tropical or out of season products, but much of it may be due to trade policies. A 2016 Congressional Research Service report blamed relatively open domestic markets with few import tariffs, allowing products to enter at preferential duty rates. Conversely, some countries impose non-tariff trade barriers such as inspection requirements and phytosanitary standards, further reducing US exports.

Weather can be a huge constraint to production. In the northeast, growing seasons are lengthening, while extremes in rain and temperatures are becoming commonplace. In 2015, a very wet growing season was followed by one of the driest years in decades. Growers are increasingly trying to weatherproof farms by expanding irrigation options and ensuring better drainage. On the positive side, traditional southern crops like sweet potatoes and watermelons are becoming part of many diversified plantings. Additionally, acres under plastic, mostly unheated high tunnels, have risen significantly, further extending seasons and improving quality.

Sometimes taken for granted are the 50 million people in the northeast that have helped drive the local food movement. Consumers are increasingly supporting local farms, through sales at roadside stands and farmers' markets, or at supermarkets and restaurants that are marketing locally produced commodities. One trend that might be an offshoot of the local foods movement is a focus on better tasting vegetables. Both public and private breeding programs in the northeast are releasing new varieties of vegetables that provide the best of both worlds – the perceived quality of heirloom varieties, but with improved disease resistance and storage abilities. Customers will be looking for these new varieties.

The market for organically certified produce grows each year. In 2014, the last year for which we have statistics, there were 196 certified and exempt organic vegetable growers in New York, with 1,571 acres harvested. Acreage is likely underestimated as some growers have decided to forgo certification and the organic label, and market directly to their customers with labels like "natural."

For 2017, the only certainty is uncertainty. Federal and state policies could significantly impact profitability. On a positive note, millions of consumers are at our doorstep, many demanding locally grown vegetables. Although complaints about the weather are serious, Northeast growers do not face a potentially devastating long-term drought like their counterparts in California. Although 2017 will be difficult, vegetable growers in the northeast have proven they are up to the challenge. ◆

A Rough Few Years for Low-Grade Wood Markets in the Northeast

ERIC KINGSLEY
Innovative Natural Resource Solutions

Since 2014, Maine has lost markets for more than 4 million tons of wood annually. This loss has primarily affected softwood, pulpwood and biomass chips, and is equivalent to more than 350 truckloads every day, 365 days per year.

Maine isn't alone. Across New England and New York, markets for low-grade wood face challenges. Some will survive, attract new investment and become stronger. Others will stagger along for a while, searching for routes to profitability. A few will close and disappear. With planning and some luck, we will also see some new and expanded markets.

Pulp and paper has long been the anchor of the region's economy, but has been suffering a slow and unending decline. Since 1999, the region has lost 11 pulp and paper mills. While each mill is unique and its success can't be lumped in with others, it is clear that the overall loss of markets for printing and writing paper – brought on by a move to digital, as well as increased imports – has ravaged the region, and left idle mills in its wake. The coated paper industry, an important part of the region's industry, has seen a 16 percent market decline between 2010 and 2014, with losses continuing. Other paper sectors important to the Northeast have seen similar – or more severe – market loss.

Amid a flurry of bad news, there have been bright spots. A new tissue machine – an investment of around $150 million – is now up and running in Woodland, Maine. While this value added processing doesn't add any new demand for pulpwood, it does help stabilize the sister pulp mill and bring jobs to Downeast Maine. Other mills in New York and Maine are investing in efficiency, new wood yards and product development.

Biomass electricity, another key market for low-grade wood, is facing its own challenges.

Driven by a combination of low natural gas prices, decreased demand and increased efficiency, wholesale prices for electricity have steadily fallen over the past few years. While great news for everyone on the "buy" side of the electricity grid, this presents real economic hardship for biomass plants trying to sell power.

At the same time, Renewable Energy Certificates (RECs) – designed to help support operations of renewable energy facilities – have become harder to qualify for and less valuable. In addition to challenges at stand-alone biomass facilities, we have seen biomass markets disappear when pulp mills close (many mills use biomass to power their operations), and some mills switching from biomass to natural gas in order to purchase the least expensive fuel.

Responses have varied. Earlier this year, facilities in Jonesboro and West Enfield Maine closed, citing the loss of RECs and depressed wholesale electricity prices. The Maine legislature recently awarded a total of $13.4 million in above market contracts to Stored Solar (the new owner of these two facilities) and ReEnergy Holdings in order to support operations. While this certainly isn't a long-term fix, it will allow these facilities to operate for a while, hopefully buying them time to develop new income streams.

In New York, at least one facility has operated during seasons of high electricity prices – winter and summer – and gone idle during the shoulder seasons of spring and fall. We will probably see more facilities use this strategy, which can be particularly hard on loggers who get turned on and off like a faucet.

Wood pellet mills have also suffered. A drop in heating oil prices – from over $4 per gallon in early 2014 to roughly $2 per gallon in late 2016 – has, in many applications, taken away an economic incentive to use wood pellets for heat. Combined with an unusually warm winter in 2015-2016, which left tons of unused inventory in basements and garages across the region, it has been a hard year for wood pellet manufacturers.

These markets losses and challenges have rippled through the forest industry. At this point we have more logging capacity than demand, which means that some firms will need to close or downsize.

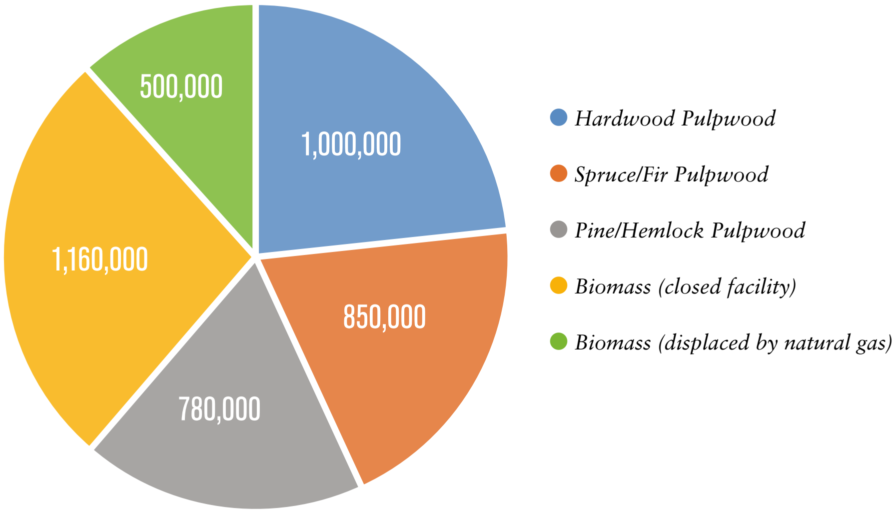
For landowners, the loss of markets has resulted in limited forestry options and decreased income. There are certainly some smaller landowners that have held off on harvesting due to limited markets for certain species of pulpwood – when this happens, the sawlogs that would have been cut as part of a timber harvest are also removed from the market.

For sawmills, the loss of markets for chips and sawdust has reduced income for these facilities, and is beginning to serve as a brake on some facilities' ability to increase production to meet lumber demand.

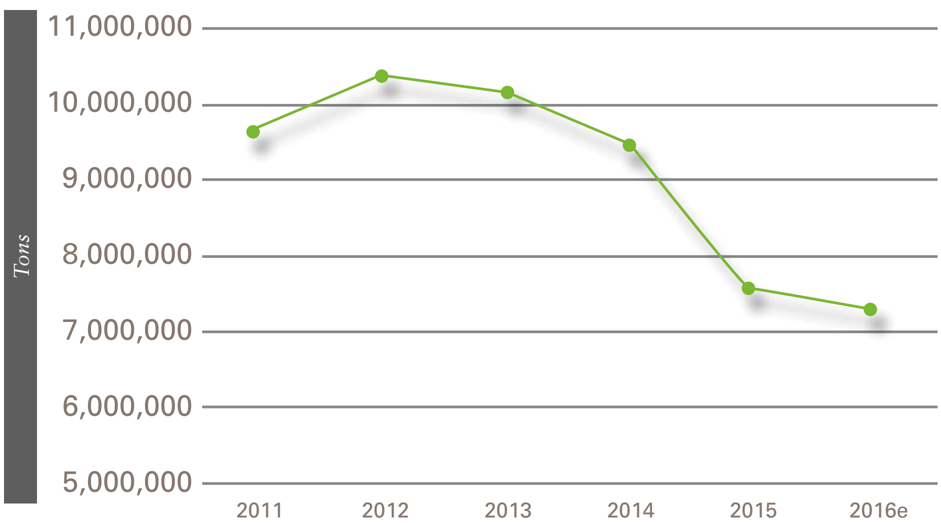
It has been a hard few years for the Northeast forest industry, and unfortunately, this market slump isn't over. However, there are hopeful signs. Biofuel and bio-product research is looking to move products out of the lab and into production, and a number of firms are actively evaluating the region for investment. New building technologies are providing possible outlets for low-grade softwood. Applications are being developed for nano-cellulose derived from trees. None of these will be easy or immediate, but all offer promise.

In all honesty, there has probably never been a better time to be developing new markets for low-grade wood, particularly softwood. The region has a diverse supply infrastructure, communities that are used to and often supportive of timber harvesting and forest product manufacturing, and proximity to an enormous market along the eastern seaboard. Our challenge will be finding, developing and operating these new markets in a way that benefits the entire industry. ◆

MAINE MARKETS LOST SINCE 2014: ANNUAL CONSUMPTION (TONS)



MAINE PULPWOOD CONSUMPTION (ALL MILLS)




KOMATSU
STAY BACK
300FT 90M
KOMATSU
STAY BA
300FT 9
XT
430

GREENHOUSE & NURSERY *situation and outlook*

CHARLES R. HALL, PH.D.
Texas A&M University

In last year's outlook, I referred to the economy as a plow horse economy; one that plods along slowly (in contrast to a majestic race horse), but deliberately gets the job done. That is indeed what we experienced, with the tailwinds picking up a little during the last two quarters. GDP growth finally surpassed the three percent mark and the end-of-year transition looks promising.

As such, the green industry outlook for spring 2017 is a good one. There are very few red flags among current economic indicators to suspect any surprises in economic performance in the first couple quarters of 2017. Even the slight mid-December increase in interest rates by the Federal Open Market Committee (FOMC) will likely have a minimal impact. One of the continuing bright spots in the coming year is the housing market, a prime influencer of derived demand for green industry products and services.

Even though housing starts have more than doubled from their recession-inflicted bottom, overall starts are currently about 1.2 million units, which is about half of pre-recession levels. The first housing forecasts are just now being released and they range from 1.2 to 1.3 million starts projected for 2017. Demographics and the rate of household formation suggest that starts will increase to around 1.5 million by 2018 and this should be a sustainable level of housing development.

Residential investment and housing starts are usually the best leading indicator for the green industry economy, so this suggests that green industry sectors will continue to grow in 2017. In fact, a recent econometric forecast of historic personal consumption expenditures on plant sales indicates that, holding all other things constant, the market for ornamental crops will continue to rise through 2019.

As for the commercial real estate sector (where a substantial number of flowers, shrubs and trees are also sold), the readings of the AIA Architecture Billings Index (a leading indicator for commercial real estate) over the last year suggest more increases in CRE investment in 2017 (except for the oil sector, which is still recovering from the recent decline in oil prices). Again, it appears the green industry economy is poised for more overall growth in 2017 from both the residential and commercial markets.

There are other key economic indicators that carry us positively into 2017. First, the number of new claims for unemployment insurance benefits is at the lowest level in 40 years (even with a much smaller population back then). The four-week average of new unemployment claims has fallen to less than half of what it was during the last recession.

Job openings have also been strong, above 5 million for 20+ consecutive months. Also noteworthy is that the number of people quitting jobs is up year-over-year. These are voluntary separations, which mean that folks are trading up to better jobs. More job openings, and rising quits, are therefore positive signs for the labor market.

Household debt burdens have declined sharply over the last several years. The household debt service ratio was at 13.2 percent in 2007 and has fallen to under 10 percent now. This data suggests aggregate household cash flow has improved. More disposable income translates into more opportunities to sell folks plants and landscape services.

Lower gasoline prices are another positive. Gasoline prices are slightly higher than the same time last year, but are near the lowest they have been since the recession, which also translates into more household income.

I still have reason to believe that the most successful nursery and greenhouse firms in 2017 will be those that are well-positioned with their customers in the marketplace, not overleveraged and clearly articulate their value proposition. We will likely see continued structural changes across the industry supply chain as we morph into the more compact and efficient industry of the next decade. This will not only mean further consolidation in the industry, but deeper, more strategic relationships among those left from the transition. The next decade of the green industry will not look the same as the last decade. ◆

> The green industry outlook for spring 2017 is a good one.

IMPLICATIONS *of the* FOOD SAFETY MODERNIZATION ACT *for* NORTHEASTERN FARMERS

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Assistant Professor and Extension Economist, University of Connecticut

Implementation of the Food Safety Modernization Act (FSMA) has drawn a fair amount of attention, especially among smaller growers of fruits and vegetables. This article provides an overview of the FSMA Produce Safety Rule and the economic effect it is expected to have on Northeast growers.

Background

The FSMA legislation, signed into law in 2011, expanded the authority of the U.S. Food and Drug Administration (FDA) to regulate the safety of food sold in the United States. The legislation required that FDA develop and issue certain regulations or "rules" that specify required practices and standards for farms, processors, shippers and marketers. The rules were finalized in 2015 and 2016, and compliance with some rules affecting processors and manufacturers was required beginning in September 2016. FSMA does not apply to retailers or restaurants, and does not change rules affecting the production of meat, poultry and most products containing meat or poultry.

The FSMA Produce Safety Rule will require that most growers of fresh produce, with produce sales of at least $25,000, undertake specific practices designed to reduce the likelihood of food-borne illness outbreaks from pathogens such as Salmonella and E. coli. The required practices under the Produce Safety Rule include inspection of agricultural water several times per year; hygiene and sanitary standards, such as ensuring that toilets and hand washing stations are convenient for workers; monitoring fields to prevent contamination with animal feces; and sanitizing farm equipment, tools and buildings, especially food-contact surfaces. (Some of these provisions are already required in certain states.)

These requirements apply to all produce intended to be sold fresh and consumed raw; they do not apply to produce that will undergo a "kill step" during processing (such as canned vegetables), and those commodities designated as "rarely consumed raw" by FDA (such as asparagus and sweet corn). Microbial testing of food is not required by FSMA. -

The FSMA legislation provides an exemption for "direct farm marketing". The criteria for exemption is that farms must have no more than $500,000 in annual revenue from sales of food (including produce), and must make more than half of their sales (in terms of value) directly to consumers, restaurants or retail food establishments within the same state or within a 275-mile radius. Farmers who sell produce at farmers' markets or direct to consumers at roadside stands are not automatically exempt from FSMA unless they meet these specific criteria. The qualified exemption does require that the farm name and location be displayed at the point of sale, to facilitate tracing problems back to the

farm; FDA may revoke the exemption if a problem is detected.

Economic Effects of FSMA

The impact of FSMA on smaller producers is one of the main controversies that has emerged regarding the law. Several factors will make the cost of implementing the Produce Safety Rule lower, as a share of revenue, for larger farms. First, certain cost components are fixed regardless of farm size, such as the labor time required to learn the rule and train workers. In addition, large farms may achieve some efficiency gains from repeating the same process across many fields or orchards. Finally, many large produce buyers already require that their suppliers undergo audits for compliance with the Global Food Safety Initiative (GFSI), Good Agricultural Practices (GAPs), or other food-safety standards. Farms that already undertake these practices may have lower costs to comply with FSMA, as they may be already largely compliant. Evidence suggests that larger farms are more likely to have adopted GAPs.

For farms that do not qualify for exemptions based on value of sales or commodity grown, compliance with the Produce Safety Rule could be costly. FDA estimates that the average non-exempt farm with $86,000 in sales, for example, will incur recurring costs of $5,872 per year, or 6.8 percent of the value of sales. FDA's analysis of costs fails to account for the extent to which farms already comply with components of the Produce Safety Rule, either on a voluntary basis or as required by state law or buyer standards, so the actual cost of FSMA compliance may be significantly lower.

Recent research suggests that, on average, Northeast produce farms will see costs rise between two and three percent on a recurring basis, if they have not already adopted any of the practices required under FSMA. This is significantly higher than the projected average cost increases in states such as Arizona, California and Florida, where large farms dominate. Because the market for fresh produce is integrated at the national level, average price received by farmers is likely to rise slightly, but not by enough to allow Northeast farmers to fully recover their increased costs of production. Economic forecasts indicate that the implementation of FSMA would increase the retail price of fresh fruits and vegetables by less than one percent, on average. Thus, even though consumers and large producers might barely feel the effects of FSMA, smaller farmers in our region need to be prepared for significant increases in the cost of growing fresh produce.

GROUNDFISH

HANK SOULE
Manager,
Sustainable Harvest Sector

In New England, nearly 100 types of seafood worth over $1.2 billion are harvested annually from our many fisheries. Of those, the top three are scallops, lobster and a basket of about 10 species known as “groundfish.” Groundfish are bottom dwelling species such as codfish, haddock, several types of flounder and others that cohabitate on the ocean floor.

The codfishery was colonial America’s first industry. Boston alone, which established the United States’ first commercial fishing pier 100 years ago, once unloaded 200 million pounds of fish in a year – more than four times the entire annual catch of groundfish throughout all of New England today.

Forty years ago groundfishing was the most valuable fishery in New England. But a combination of changing resource conditions and regulatory actions across all three fisheries have demoted it to a distant third place (Figure 1).

Now, the number of boats in the fishery has dropped from more than 1,500 three decades ago to perhaps 300 today. Several outlying ports which used to be smaller but important hubs of groundfish catch see little to no groundfish landings today. Maine’s groundfish landings, which once commanded a 25 percent regional market share, have plummeted (Figure 2). The number of jobs in Maine’s seafood processing industries has dropped from 1,800 in 1995 to just 800 today, and would be even fewer if not for development of value added lobster products.

Less publicized is the fact that as a whole groundfish are not being overfished, and in fact have not been for some time. Each year, scientists calculate optimal population levels and catch limits for the various species of fish. Crafting rules to match groundfish catch limits to actual catch is particularly difficult, because each species has widely differing optimum populations and catch limits. For example, the current catch limit for cod is 900 tons, while the limit for haddock is 54,000 tons - a 60-fold difference. It’s not easy to strictly curtail the catch of the former while encouraging more catch of the latter – especially when they often swim side by side.

For many years, the government tried to control harvests of all groundfish in the basket by limiting the number of days fishermen were allowed to harvest each year. By the numbers, this approach did not, as required by law, end overfishing of each one of the groundfish species, such as cod. It did however, result in significant under-fishing of some species, such as the aforementioned haddock. As time passed the government overlaid new limits, such as area closures, fishing gear limits and others, which decayed into a morass of regulatory requirements.

Thus seven years ago, the government abandoned its focus on days fished, in favor of strict numerical catch limits on each type of groundfish. The new system, called “catch shares,” largely delegated responsibility for meeting those limits to the industry, effectively saying “You can fish as many days as you want, just make sure you don’t exceed these numerical caps.” Since then, the fleet has not exceeded those caps on any stock, except for one year when regulators retroactively reduced a harvest threshold at the very end of the year.

Has New England’s “catch share” system worked? It has succeeded in reducing the number of boats participating in the fishery, which was an explicit goal of regulators – if not those being regulated. It has succeeded in bringing catch within mandated limits. It has succeeded in allowing the many fishermen forced out of business to lease their scant fishing allocations to those who remain, recapturing some value from their debased fishing permits.

It has failed to rebuild fish populations to levels projected by computer models. It has failed to increase sustainable use of the resource: nearly two thirds of the allowable catch of groundfish remained unharvested last year, unchanged from the start of the new system in 2010. Total catch has fallen from 30,000 tons in 2010 to just over20,000 tons today. The decline in the number of boats fishing, manned by qualified and experienced crews who will never return, makes it harder to recapture that lost ground.

Yet in that underutilization lies the hope for a resurgence of the fishery. Each year, over $100 million of groundfish swim about the Gulf of Maine and Georges Bank waiting to be harvested, every year for the foreseeable future.

Our captains now average over 50 years in age. Though fishing, much like farming, is more a way of life rather than a job, and their retirement lies not too far on the horizon. Overfishing has largely ended, the fleet has right-sized to new catch limits and $100 million of opportunity awaits a new generation of fishermen with the grit – and the capital – to steam offshore and catch it. ◆

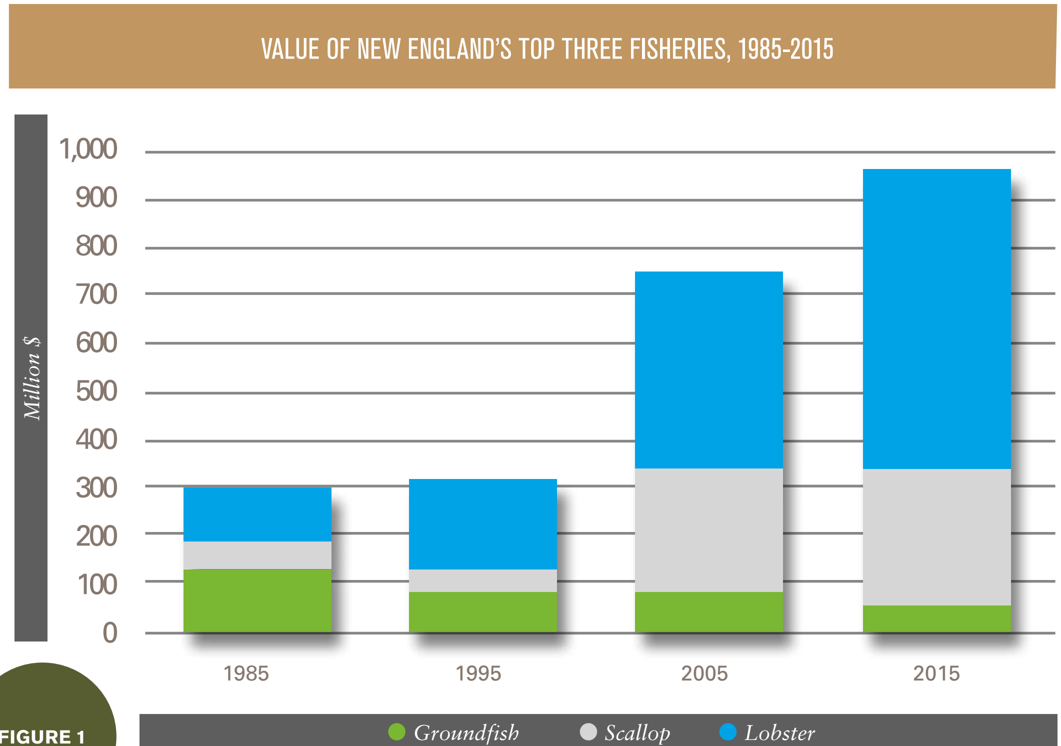

FIGURE 1

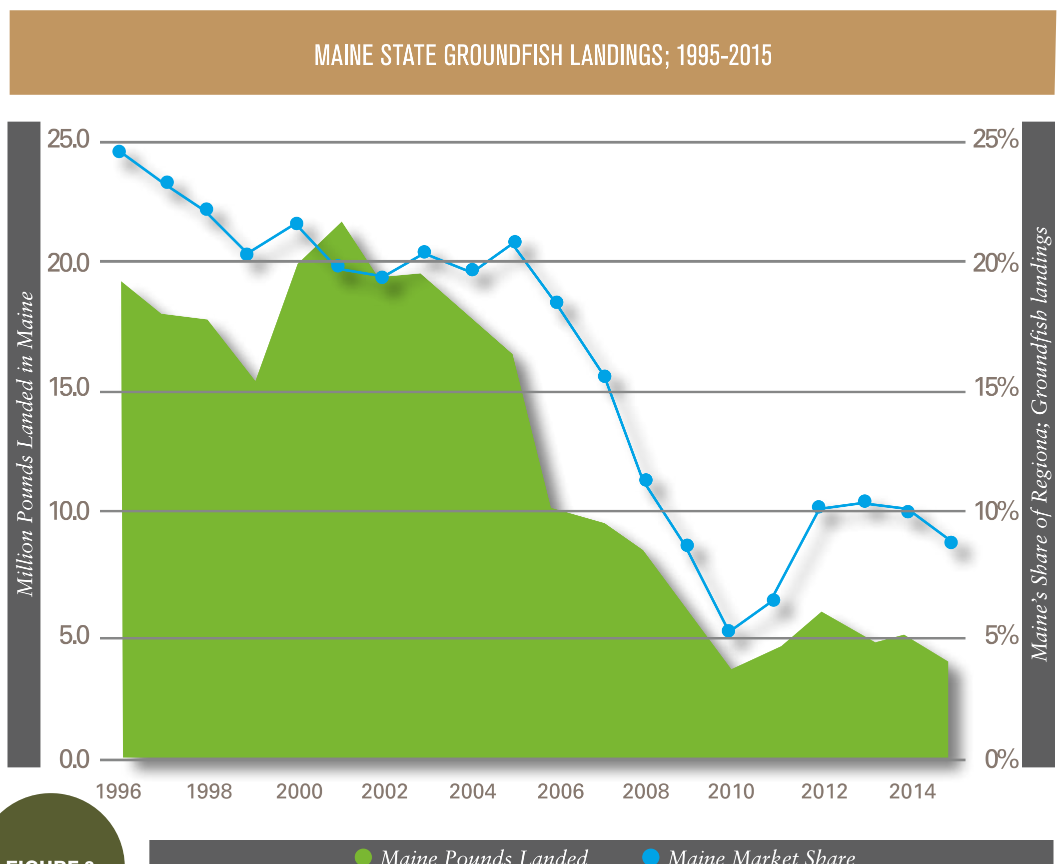

FIGURE 2

NOTES

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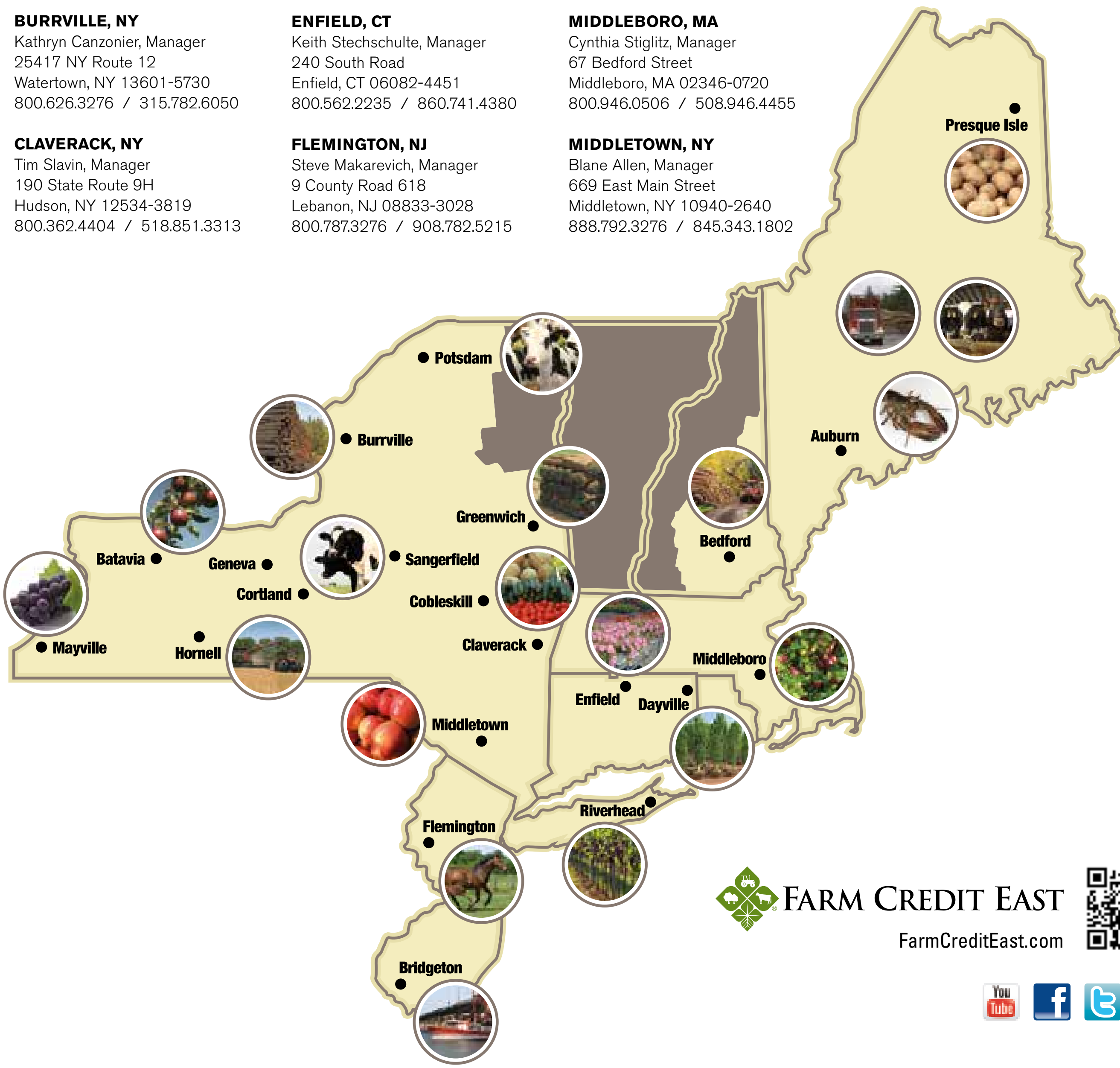

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