farm viability

NYFVI PRIORITIES

Farmer-Level Impacts

Farmer-Identified Needs & Opportunities

Farmer-Board & Review Panels

Farmer Outreach

Direct Farm Engagement Projects
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In August 2017, I was honored to be elected as the chair of New York Farm Viability’s board of directors. Farm Viability continues as a strong, vibrant organization and is playing an increasingly important role in advancing New York agriculture.

I would like to thank our prior chair, Jim Bittner, and all the past board members for ensuring an organization that was built to last for New York’s farmers. We’ve asked Jim to provide some final thoughts about Farm Viability and you’ll find those on page 8.

Our current board, pictured on the left, is fully committed to the Farm Viability organization and its mission to improve the economic viability of New York’s farmers through the creation and sharing of knowledge.

2017 was a strong year for NYFVI. We funded 16 projects through our competitive grant cycle, 4 projects as focus grants, and one partnership project for a total investment of just over $1.7 million.

We’re particularly excited by the project that we are jointly funding with Angry Orchard Hard Cider to develop economically viable cider orchards in New York. This is a two-year investment of $150,000 for work that will be led by Dr. Gregory Peck with the Horticulture program at Cornell University. We hope to be able to use this leveraged funding model with other partners moving forward.

Over the last year, 23 projects completed their work. Farm Viability invested just over $1.5 million in these efforts. Based on the numbers in their final reports, over $26 million was returned to the agricultural community as measured by increased revenue, cost savings and capital investment. These results bring the total documented return to nearly $135 million. That’s almost 8 dollars for every dollar invested.

It’s worth noting that the number only captures impact realized during the life of the grant, and in our business, these increases can be realized year after year.

Just as our projects encourage continual improvement at farm operations, our staff is focused on continually improving the organization’s programs and ensuring that we are meeting stakeholder’s needs.

For example, last year we moved our review process from paper to online, allowing farmer review panel members across the state to directly access, read and score proposals in the online database.

Staff also took the lead on important work to evolve our Request for Proposals (RFP) for the 2018 program. We reached out to more than 50 past and present project leaders to ensure the technical aspects of our program—grant size, duration and reporting requirement—were allowing projects to excel. We also asked this group “What will create the most economic opportunity for New York farmers?” More information about their responses, and the actions we took as a result, can be found on page 4.

I’m excited about the leadership NYFVI is providing on behalf of New York’s agricultural community and proud to lead the organization as it continues to grow.

Thank you for your support,

Mike Jordan
Chair, New York Farm Viability Institute
Olde Chautauqua Farm

“Since 2005, 245 projects have been completed with our funding. These projects have contributed nearly $135 million to the ag community as measured by new revenue, reduced costs and new capital investment. This is all thanks to the steadfast support of Governor Cuomo, Senator Ritchie, Assemblyman Magee and the Senate and Assembly Agriculture Committees. We remain deeply appreciative of the trust and confidence they have placed in our organization and their support of our mission.”

Mike Jordan
Chair, NYFVI
2018 FVI Request for Proposals: Technology, Soil Health, Collaboration Encouraged

Last summer, Farm Viability staff interviewed 51 of our past and present project leaders, asking questions about where they sought funding, what they liked about various grant programs and how we compared to other funders on technical aspects such as the size of our awards, duration of our grants, and reporting requirements. The most interesting part of the discussion occurred when we asked, “What will create the most economic opportunity for New York farmers?”

Some researchers and educators felt that economic improvement for farmers would build incrementally through continuous improvement, similar to how many NYFVI projects have traditionally created positive impact at the farm level.

Many project leaders jumped to the role of technology and digital agriculture as part of the solution.

There was strong agreement that a challenging labor market is pushing the industry to labor saving efficiencies and automation. There was also concern that the current labor force isn’t prepared to manage the new technology, and that people with the right skills are in short supply. This is a sentiment we’ve heard from farmers as well.

Project leaders were excited about the potential of predictive modeling, enabled by the availability of more data, to help farmers make better management decisions. However, several did note that the scale of the farm and the skills of the farmer would be critical factors in determining “what was next”.

NYFVI staff was surprised to hear the frequency with which soil health was mentioned as an economic opportunity for farmers. It’s also interesting to note that more than one person mentioned — in all seriousness — that increased consumption of produce needed to be part of the answer.

To sum it up, four themes emerged from our discussions: Continuous improvement, technology, soil health and increased consumption of produce.

The next step was to evaluate what we had learned from the project leaders against the investments in our project portfolio. Farm Viability wanted to know, if these are the areas that are going to make a difference, how are we doing?

Projects focused on continuous improvement are a hallmark of our organization. These proposals come in on a regular basis.
and the ones that the farmers feel are valuable are usually able to be funded.

Work focused on increased consumption we decided to leave to others to tackle.

The soil health and technology topics were a little trickier to sort out.

On the soil health front, Farm Viability has funded a number of projects over the years, particularly in the field crops area. One project leader has been particularly successful in work that has moved the discussion from cover cropping, which can be considered an environmental practice, to winter forages, which is a business and production practice that is a win for everyone.

As for technology, Farm Viability has been funding projects in precision agriculture since 2005. In fact, when we looked back across all the proposals Farm Viability has received over the last decade we realized that we’ve funded more than 90% of the technology proposals received.

So the challenge became to receive more of these proposals. The first step was to clearly express our interest in accelerating the adoption of technology on New York’s farms in this year’s Request for Proposals.

We also came to a much clearer understanding about the need for a multidisciplinary approach to accelerate the development of this field and realized that we could play a critical role to bring potential collaborators together.

As an organization, we firmly believe that a broad network that encourages collaboration between the invaluable agricultural expertise found at the College of Agriculture and Life Sciences at Cornell, a SUNY school as well as New York State’s land grant university, and the excellent computational scientists, software developers and engineers at other SUNY schools will help our projects create and share knowledge.

That’s why, with this grant cycle, NYFVI reached out to our traditional plant and animal researchers and introduced them to colleagues at the University at Buffalo’s Center for Computational Research. As a result, we received several collaborative proposals and are eager to see how they fare in the review process.

Data analytics are only one of the many new technologies that are being developed for agriculture. NYFVI also received a proposal from Rensselaer Polytech that seeks to use ultraviolet light to fight downy and powdery mildews in squash.

We were also pleased to see the number of Cornell proposals nearly doubled this year.

Our emphasis on technology also created agribusiness interest in our program. Four companies submitted proposals to develop new technology and tools for New York’s farmers.

At Farm Viability we’re excited about the collaboration we see building, and the number of organizations hoping to apply their expertise on behalf of New York’s farmers.
NYFVI Programs By the Numbers

In 2017, Farm Viability had nearly 100 projects under active management and disbursed approximately $2.25 million to these efforts. While most of these project are part of the FVI program, NYFVI also administers 18 Specialty Crop Block Grant projects, oversees Focus Opportunity grants and Dairy Profit Team projects that are working with more than 100 farms.

NYFVI Dairy Profit Program. This program is using a “topic specific” approach to support extension agents and other educators to work directly with farms to solve problems. Currently there are a dozen teams working with around 100 farms across the state. These projects are helping farms improve their management practices, better manage lameness in dairy herds, make good feeding decisions and take other actions to improve profitability.

Focus Opportunity Grant Program. The opportunities and challenges facing NY farmers are constantly shifting. The NYFVI focus grant program provides the organization flexibility to quickly respond to off-cycle requests as funds permit. The program considers funding requests on an ongoing basis and decisions are made by the board. The primary source of funding is unspent funds from prior projects.

In 2017, NYFVI responded to four requests for focus grants and was able to support $213,000 worth of valuable work. These funds are supporting pollinator work at Cornell University by the McArt Lab, hemp research at Morrisville State College, exploring the feasibility of a value-added meat processing facility with Waterville First and providing critically needed resources to identify immediate solutions for managing an emerging invasive pest, the Allium Leafminer, in onions and other allium crops.

“Right now, we see cider in an education phase for the drinker as well as for apple growers and producers. With that, comes a great opportunity to work collaboratively, across sectors and interests, to help reinvigorate cider culture in the U.S. Ultimately, we envision a demand-driven cider marketplace that values creativity, experimentation and innovation in the name of fostering an appreciation for cider in the US on the scale and scope we have in Europe.”

Ryan Burk,  
Head Cider Maker  
Angry Orchard, Walden, NY

NYFVI Dairy Profit Program

<table>
<thead>
<tr>
<th>ProDairy</th>
<th>CCE County</th>
<th>CCE Regional Teams</th>
<th>NOFA NY</th>
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Topic Specific Teams by Organization.  
Working with over 100 farms
USDA Specialty Crop Block Grant Program: Putting Farm Viability’s Farmer Driven Review Process to Work.

In 2017, the New York State Department of Agriculture and Markets continued to administer the USDA Specialty Crop Block Grant Program in partnership with NYFVI. The Farm Viability review panels scored and evaluated 19 proposals, six were selected for funding. Currently, 18 specialty crop projects are being administered by NYFVI, utilizing funds from multiple Specialty Crop Block Grants.

Breeding Tomatoes with Enhanced Early Blight Resistance in Combination with Late Blight and Septoria Leaf Spot Resistances and Acceptable Fruit Type
Cornell University, $99,902

Novel Seed Treatments for Early Season Disease Control and Increased Profitability of the Table Beet Industry in New York
Cornell University, $99,834

Enhancing Vine Health with Soil Microbial Stimulators in Vineyards
Cornell University, $88,479

Quantifying Survival Rate of Erwinia amylovora in Cankers and Its Impact on Fire Blight Outbreaks and Management
Cornell University, $99,887

Sustainable and Safe Methods to Address Biological Threats to the Rapidly Growing NY Hops Industry
Cornell University, $97,903

Strengthening diagnostics for oak wilt, Ceratocystis fagacearum, through implementing new technologies, improving techniques and increasing outreach education
Cornell University, $98,988

“The New York is one of the largest producers of specialty crops in the US, and the quality of these products is incredibly important to the strength of our agricultural industry. By supporting critical research and outreach, these grants will boost the health and resiliency of key crops, help farmers to overcome common challenges in specialty crop production and allow them to remain competitive in national and international markets.

We thank the Farm Viability Institute for its partnership in this program.”

Commissioner Richard Ball
New York State Department of Agriculture and Markets
Farmers. Farmers are built into the entire process. Farm Viability’s goal is to continually connect the real world experience and needs of the New York’s farmers to the tremendous expertise of our project applicants.

As I have said many times, the board is all farmers, and the proposals are evaluated by farmer review panels. It’s important to realize the connection goes much deeper. Within each proposal, grant applicants are asked to share how farmers will be involved in the work. Are they on an advisory board? Will the work be trialed on their farm, or will they participate in the outreach? The evaluation and scoring system favors projects that demonstrate that farmers think the work is important and that farmers will be involved. We call it the producer involvement score.

Focus. The second F, is focus. As an organization, we use an Outcomes focused funding model. This approach, and the structure of our application, leads to proposals that have clear outcomes in mind as the research or education is considered and planned.

It’s easy to develop a proposal that focuses on what you are planning to do. It’s harder to develop a proposal that puts a stake in the ground and offers performance targets that say what the work will achieve.

This model asks researchers to connect their work to the long term economic improvement of New York farmers. In late stage applied research those links are easy to measure. Did the yield increase? Or did the input costs go down? If an applicant is interested in earlier stage work, a strong proposal will usually include an economic analysis of the production process being developed. This demonstrates that they share our focus on creating profitability in the long term.

Flexibility. And while we’re focused, it doesn’t mean we aren’t flexible, and that flexibility makes us pretty nimble.

Over the years, Farm Viability has demonstrated its common sense approach and ability to move quickly. We’ve helped project leaders respond to emerging threats, such as the recent allium leaf miner, as well as provided the researchers the opportunity to seek federal funds with our matching dollars.

The other aspect of flexibility is our commitment to funding projects—not programs. This means that every year we fund the best proposals we receive. Those proposals are evaluated on six criteria: producer involvement, relevance to NY agriculture, work plan, outreach plan, evaluation plan and its overall value proposition.

We don’t have quotas for commodity areas. So if, for whatever reason, we don’t receive proposals in a certain area, or don’t think the work is outstanding, we simply don’t fund that commodity in that grant round. In the end it all seems to average out, with our historical funding reflecting the size of the industry in New York.

“New York farmers are fortunate to have NYFVI working to connect research dollars to real world challenges.”

Jim Bittner
Past chair, NYFVI
Bittner Singer Orchards

Why NYFVI is the Right Investment for Agricultural Dollars

by Jim Bittner

Although I have “termed out” of the Farm Viability Board of Directors, I continue to be passionate about the organization and the value it provides for New York’s farmers. I would like to reiterate why this organization is so important, and why it is the right investment for agriculture research dollars. It’s about the four F’s: Farmers, Focus, Flexibility and the Future.
This flexibility, and pragmatic approach is part of the organization’s DNA. It’s been there from the beginning and has helped us through some difficult years.

**Future.** Over the last several years Farm Viability has proven itself to be pretty adept at thinking about the future. Farm Viability funded precision agriculture work in 2005 our first year as a stand-alone organization.

The Adapt N story, excerpted to the right highlights that the Farm Viability Board and Review panels are pretty good at thinking about the future with the work we’ve funded.

It’s not just precision ag where we’ve been ahead of the curve. Other examples include funding food hubs in 2007, funding Pollinator projects in 2015, and funding spotted wing drosophila work in berries and hops disease management strategies before those programs received state appropriations.

In the Farm Viability board room there have been some interesting conversations about the increasing number of line items for agriculture in the state budget. Should we feel good that the seeds we’ve sown are being recognized as important? Or do we run the risk of becoming less relevant?

**I take it as a win.** I think when others adopt the work we’ve funded it validates that it was important, valuable work. And, it pushes Farm Viability to always be scouting the horizon, thinking about what we can do to create the most value for New York’s farmers.

That’s what we’ve done in the past, and that’s what we did with this grant round with our emphasis on technology and broadening the network of researchers working in agriculture.

To sum it up, I am excited about the future of agriculture in New York State and the value that Farm Viability and its projects are delivering.

Farmers, Focus, Flexibility, and the Future. There’s only one more F to add, and that’s Funding. We hope our stakeholders in Albany remain committed to our shared mission and continue their support.

**NYFVI and Adapt N**

In 2008 NYFVI funded a Cornell project, “Adaptive Nitrogen Management with Silage Grain and Sweet Corn Production” led by Dr. Harold Van Es. With prior funding from the USDA, Van Es and his team had built a computer model, “Adapt N” which integrated the effects of early-season weather and soil conditions to provide precise Nitrogen fertilizer recommendations. With NYFVI funding Van Es was able to trial his tool and its predictions in the field.

Farm Viability invested $100,000 dollar in 2008 and also funded two additional Adapt N projects. In total, the organization invested around $280,000. The last project completed in 2017.

In 2015, Cornell began licensing the technology to a small North American company called ATC, the Agricultural Technology Corporation. In November 2017, ATC was purchased by Yara a global fertilizer company. Though the parties have decided not to release a price tag on the deal, Yara International said that the investment was significant. The company was quoted as saying “It was not in the range of $1 billion to $550 million, but it was also not $1 million”
NYFVI Projects: Fostering Innovation in Agriculture

Applied research is a tricky area. While there is always valuable knowledge gained from testing in the field, sometimes what you learn is what doesn’t work well in specific conditions, or perhaps in New York overall. This group of projects is focused on learning how farmers can best adopt new production practices. The risks involved are moderate, and mainstream adoption of the practice is likely to be 2 to 5 years from demonstrated success.

Projects Completed 11/1/2016-10/31/2017

- Partial Mechanization of High Density, Tall Spindle Apple Orchard Pruning, Thinning and Harvest for Improved Profitability Cornell University $110,386
- Prediction of Soft Scald in Honeycrisp Apples to Manage Storage and Marketing Cornell University $42,420
- Impact of Extending the Postpartum Voluntary Waiting Period on Reproductive Performance and Profitability of Lactating Dairy Cows Cornell University $143,896
- Improving White Grub Control in Sod Through Establishment of Persistent Entomopathogenic Nematodes Cornell University $70,000
- Cost-Effectiveness of Oral Calcium Bolus Supplementation in Commercial Dairy Herds Dairy Health & Management Services, LLC $99,907
- Association Between Select Bulk Tank Bacteria Counts and Milk Quality Quality Milk Production Services, Cornell University $59,878
- Low Tunnel Strawberries: A Cost-Effective Approach to Extending the Growing Season School of Integrative Plant Science, Cornell University $129,880
- Increasing the Efficacy and Economic Viability of Trap and Kill Systems for Invasive Pests Hudson Valley Lab, Cornell University $99,614
- Using Cover Crops to Improve Soil Health and Vine Productivity in Concord Vineyards Lake Erie Regional Grape Program, Cornell University $45,130
- Assessing the Impact of Pesticides on Honey Bee Health Department of Entomology, Cornell University $120,000

Prior Year Awards

- Site Trials and Producer Outreach to Demonstrate Suitability of Turkish Fir for Adoption for Commercial Christmas Tree Production in NYS Christmas Tree Farmers Association of New York $59,428
- Optimizing Precision Agriculture Technology Implementation in New York State New York Corn & Soybean Growers Association $149,982
- Alfalfa-Grass Management to Maximize Milk Production from Dairy Cattle Cornell University $82,388
- Effective Aphid Management in Greenhouse Crops by Optimizing Biological Control and Nutrient Inputs Cornell University $132,858
- Winter Forage: Impact of Early Planting on Nutrient Storage and Spring Yield. Advanced Ag Systems LLC $88,593
- BMR Sorghum and Winter Forage for Double Cropping Advanced Ag Systems, $100,000
- Equipping Apple Growers to Quantify the Role of Native Bees in Pollination Department of Entomology, Cornell University $100,000
- Developing a Sustainable Hops IPM Program from Greenhouse to Harvest. Cornell University, $124,500
- Optimizing Use of Native Persistent Nematodes for Biological Control of Plum Curculio in Organic and Conventional Apple Production Cornell University, $101,152
- Onion Growers Can Reduce Rot! Cornell University, $103,000
- Developing a mechanical method to seed under-vine cover crops in winegrape vineyards Cornell University, $34,848
- Insects On-Line: Forecasting insect management for nursery and Christmas tree growers Cornell University, $70,665
- Use of under vine fescues in Long Island vinifera vineyards to reduce production costs and environmental impact CCE Suffolk County, $61,028
- BMPs for Long Term Profitable High Tunnel Soil Fertility and Health NOFA NY, $116,126
- Increasing producer profitability through farm level interventions designed for optimization of spore counts in raw milk Cornell University, $106,444
- Insect-killing nematodes for biocontrol of greenhouse thrips and fungus gnats Cornell University, $105,069
- Selective Dry Cow Therapy: Increasing profits and decreasing antibiotic use. Cornell University, $102,036
Do These Things Work? Determining the Effectiveness of Automated Health Monitoring Systems for NY Dairies.

There’s a plethora of automated health monitoring systems on the market for dairy farms. Wireless sensors can be based in collars, leg bands, ear tags, or the rumen to monitor rumination, physical activity, eating time, lying time, and body temperature as predictors of a cow’s overall health. **Dr. Julio Giordano is finding out how well they work.**

Automated Health Monitoring (AHM) systems have the potential to improve dairy cow health and reduce labor costs. Unfortunately, the market is lacking independent controlled studies to understand if these systems can identify health issues more accurately and cost effectively than a traditional labor force. Julio Giordano of Cornell University is enrolling 1,200 dairy cows in a study to learn the pros, cons and economics of these systems.

The NYFVI farmer review panel was highly supportive of the project, with frequent comments indicating the importance of understanding the new tools coming onto the market. One reviewer expressed it well: “Labor is the largest increasing cost for NY dairy farms, automation is the future, research is needed to show the farmers what works.”

AHM systems may cost between $70 – $160 per cow and also require labor for daily management. They are expected to last 5 to 7 years. While that may seem expensive, if accurate they may improve a farm’s animal management and reduce their labor costs.

Giordano is partnering with Oakwood Dairy Farm LLC to conduct the research, which requires the team’s technicians to be on farm every day. The work, which will be completed in March 2019 has three primary goals:

1) Determine the feasibility of running a health monitoring program based primarily on an automated health monitoring system rather than clinical examination.

2) Quantify any potential benefits of earlier identification of disease.

3) Determine the cost benefit of AHM systems for dairy farms.

The USDA has also recognized the importance of these new tools, and Giordano has been funded to conduct more research in this area. The goal is to improve the understanding of the massive amount of information generated by sensors used in AHM systems, develop new methods to integrate data from multiple sensors, and determine the value of different types of sensor data.

“I feel this research is going to benefit our farm by catching cows that need special attention earlier, so we can intervene earlier, making them healthier and more productive over time. Knowing that we can trust these tools will help us operate more efficiently and prioritize our labor across the operation. We’ll be able to focus on the cows that need the attention, and the healthy cows can just be cows without any human interference.”

Garrett Miller
Dairy Herd Manager
Oakwood Dairy LLC
New York has over 400 species of wild bees and Danforth’s research had documented a fauna of over 120 species just in apple orchards. Moreover, wild pollinators have been shown to be more effective pollinators on a per-visit basis than honey bees, and their abundance and diversity is positively correlated with seed set in apples. Approximately half of NY apple growers rent honey bee hives but is this necessary for successful apple pollination? Growers see wild bees in their blossoms, but haven’t had a way to measure and track their numbers. For growers to know whether wild bees can provide an effective alternative to honeybees, they needed a way to easily collect and quantify their numbers.

Danforth and his team had been collecting data at New York orchards using aerial netting and were eager for a better system. In 2014, they received a NYFVI grant to build a smart phone app that allowed growers to capture the number of pollinators in their orchards, share the information to an online database, and receive customized information back from the team.

The project’s first step was to validate the data collection process, ensuring that the numbers collected via the app were consistent with current aerial net collection processes. From there, the team could define how the app needed to work and develop detailed instructions to ensure standardized data collection. Participants are asked to conduct simple 5 minute observations, three times during peak bloom. Date, time, weather and GPS coordinates are all collected as well as pest management practices and bloom stage. Users can watch a short video to learn how to use the app, they are also quizzed on how to correctly identify various types of pollinators.

At the project’s completion data had been collected in 43 orchards across 20 counties with 298 data points collected. Orchards with conventional, organic and integrated pest management practices have all participated. Extensive outreach has been conducted and the number of farmers using the app is expected to continue to grow.

Each of the participating orchards receives a customize report providing benchmark information about the pollinators in their orchard. Recommendations about how many bee hives, if any should be used as well as ways to attract more wild bees to the orchards.
NYFVI Projects: Incubating New Ideas

While most NYFVI projects are building from existing knowledge, sometimes there are projects that are focused on developing a new idea or technique. Work of this nature may or may not succeed, but have the potential to significantly alter the industry. These projects are likely to be high risk, and if successful take five or more years to reach mainstream adoption.

Projects Completed 11/1/2016-10/31/2017

- Testing a Cow-Side Blood-Calcium Meter to Identify Subclinical Hypocalcemia. Dairy Health & Management Services, LLC, $47,995
- Source Identification and Education on Sporeforming Bacterial Entry at the Dairy Farm Level: A Crucial Next Step to Production of High Quality Raw Milk In New York Cornell University $148,598
- Greenseeker Technology for Greater Corn Yield and Enhanced N Fertilizer Use for Corn Cornell University $144,591

Prior Year Awards

- Integrating Spatial Maps to Use Variable Rate Technology in Mechanized Vineyards Cornell University, $43,968
- Testing a Promising New Canopy Management Technique to Reduce Management Costs in Vineyards Cornell University $112,547

“Thanks to Dr Danforth’s science, we can now make better decisions on how to work closely with “mother nature” and be better farmers.”

Peter Ten Eyck
Indian Ladder Farms

One of the first steps in learning how to use the app is to be able to distinguish between wild pollinators, pictured on the left and honey bees pictured on the right.
Building the Case for Controlled Environment Agriculture (CEA) in New York State

Is That Opportunity Knocking? Every year New Yorkers eat an average of 18 pounds of fresh tomatoes per person, and 95% of those tomatoes travel more than 2,000 miles before consumption. Yet demand for local food has grown from $1 billion to $7 billion in the last 9 years. In April 2015, a group of stakeholders gathered with Dr. Neil Mattson at Cornell to discuss how to grow NY’s CEA industry.

New York’s short growing season and large population base make CEA, year-round vegetable production in temperature-controlled greenhouses, a strong business opportunity for a wide range of operators. Many field vegetable growers are seeking to better understand the economics before committing to CEA as a diversification strategy for their current enterprise; while other interest is from entrepreneurs that are seeing opportunity created by newer technologies and increasing demand for local foods. Additionally, many of New York’s Regional Economic Development Plans have identified CEA as part of their strategy, spurring even more interest in the practice.

In October 2015, Mattson and his team were awarded USDA Specialty Crop Block Grant funds administered by the New York State Department of Agriculture and Markets in partnership with NYFVI, to help turn the interest they were hearing into viable business plans. They worked in four areas: consumer research to validate the premium price point these products must command; the development of online interactive business tools that provide estimated production costs for lettuce and tomatoes; surveying retail/wholesale produce buyers to better understand how CEA could fit in their supply chain; and planning a two day conference to convey the knowledge the team built.

![Comparison of Costs and Profit](chart)

<table>
<thead>
<tr>
<th>Product</th>
<th>Fixed Cost</th>
<th>Variable Cost</th>
<th>Profit</th>
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<tbody>
<tr>
<td>Lettuce (Single bay with year-round prod.)</td>
<td>$200,000</td>
<td>$175,000</td>
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<tr>
<td>Tomato (Multiple bay with year-round prod.)</td>
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<td>$25,000</td>
</tr>
<tr>
<td>Tomato (Multiple bay with 8-months prod.)</td>
<td>$100,000</td>
<td>$75,000</td>
<td>$25,000</td>
</tr>
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</table>
The first step was to fully understand the consumer’s perspective and ensure that the halo of buying local extended to CEA production. The team developed a unique experimental model that provided consumers with a fixed amount of money to shop. Willingness to pay for New York field grown and New York greenhouse grown versus out of state field grown or out of state greenhouse grown products was established. Beefsteak tomatoes and baby lettuce mix were both evaluated.

The conclusion? Consumers are willing to pay 30% price premiums for New York State grown tomatoes and 18% price premiums for New York State grown baby lettuce mix.

Once the demand was fully validated, the next step was to build an interactive spreadsheet that allows potential operators to modify the inputs of a model farm and to have an estimate of the capital expense, operating expense, revenue, and profitability. The tables and figures change as the variables are modified. Users own management system, available resources, and location can affect the performance of the operation. Users can experiment with their own yields, inputs, and prices to develop a budget that will accurately represent their own operation.

Next the team worked to understand how to position CEA grown products within the supply chain. They surveyed a range of produce buyers from institutions, restaurants, and supermarkets. Their findings? Just like consumers, buyers associate local products with freshness and believe price premiums are possible for a local, year-round product. Buyers also expressed interest in a wider range of CEA products beyond tomatoes and lettuce.

Resource sheets to help potential operators understand the importance of critical decision points such as site selection, lighting and energy costs were also developed.

The project culminated with a detailed two day entrepreneur workshop bringing together 33 new/transitioning CEA entrepreneurs along with the CEA industry advisory board in November 2017. The goal is for ten of the attendees to establish new CEA vegetable production operations, annually employing more than 25 individuals and generating $5 million in wholesale farm gate value.

Attendee feedback via the conference evaluation survey was strongly positive for the growth of the industry. Respondents indicated plans for a total of 90 acres and 359 full time positions.

“How fantastic to see individuals from all corners of the industry come together to share their knowledge and learn from each other.”

Ashleigh deCarr, Bright Water Farms Utica, New York

Dr. Mattson leads a tour of Cornell greenhouse operations during the November workshop.
In April 2016, Andy Fellenz with NOFA-NY and Judson Reid with the Cornell Vegetable Program received a grant to further develop and share research based and farm tested BMPs to help growers maximize their profits with these structures.

The project proposal established aggressive performance targets: The first was to work directly with 15 growers to improve their high tunnel profitability by 25% and/or improve soil health by optimizing fertilizer inputs. The second target was to extend that knowledge, and see an additional 50 growers adopt the BMPs for their operations.

By July 1, 2016, 15 farms had been recruited for the project. Of those, seven are certified organic, three are using organic practices but are not certified, and five are conventional farms. By studying farms with different management practices the team was able to identify challenges that were common or unique to each sector, then further develop a set of BMPs for soil health applicable to both organic and conventional farms. To keep these BMPs practical the team recruited 7 farms, representing a spectrum of management styles, to rank the BMPs for potential benefit to the industry.

The first step with each of the 15 participating farms was to gather spring soil and water samples to establish baseline values for nutrient management. Foliar tissue samples were then gathered throughout the growing season to understand nutrient demand of the plants and relationship between soil and foliar nutrient levels. Each sample result was followed by detailed recommendations from project staff to the grower.

Foliar and soil test results from this project as well as previous projects have been entered into a database, and can now be used to predict or support statements relating soil pH and nutrient values with foliar nutrient results. This work provides research-based evidence for the development of BMPs.

The project is garnering significant interest from the grower community. Since the project began in the spring of 2016, over 650 growers have received training in high tunnel soil health and fertility management at field meetings, workshops and conference sessions. Many more have been reached through the dozen articles that have been published in grower newsletters. The work has also been recognized though an article in a national magazine, Growing for Market.

The participating farmers have been strongly supportive of the project. In 2016, a difficult growing season, they were able to increase their net income by 13.3%. The project team anticipates that with the 2017 harvest the project will reach its goal to improve high tunnel profitability by 25%.
“Learning about soil health to enhance our high tunnel tomato production has impacted the entire farm. We now use foliar testing to manage high tunnel tomatoes and field-grown tomatoes, peppers, cucumbers, and zucchinis.”

Chad Kirby
Kirby Farms

Chad Kirby operates the fifth-generation business with his parents Tim and Linda and sister Stacey. The farm grows 20 different fruit and vegetable crops. Fresh-picked produce feeds 180 CSA members. The mix also includes flowers and Christmas trees.
NYFVI Projects:
Improving Operational Practices

Sometimes it’s the willingness to do something differently that can put more money in a farmer’s pocket. These projects are focused on helping as many farmers as possible refine existing production practices, or learn how to implement a new process to improve their profitability. Some projects will utilize outreach and education to drive changes, others may use applied research to demonstrate the effectiveness of the proposed change. In any case, the risks are fairly low and the project should be delivering an impact in less than two years.

Projects Completed 11/1/2016-10/31/2017

Precision Orchard Management to Increase Apple Orchard Profitability
Cornell University $149,624

Expanding Use of Reduced Tillage Systems, Controlled Release Nitrogen Fertilizer and Cover Crops on Sweet Corn, Field Corn and Cucurbit Farms
CCE Suffolk County $56,533

Adapt-N and Soil Health Tools for Precision Management in Corn Production
Cornell University $149,975

Cornell Onion Thrips Management: Saves Money and Reduces Insecticide Resistance
NYS Ag Experiment Station, Cornell University $39,326

Managing an Emerging Threat: Ambrosia Beetle Black Stem Borer Control in Apple Nurseries
CCE Lake Ontario Fruit Program, Cornell University  $74,425

Dairy Discussion Groups Support Learning
Pro Dairy, Cornell University $16,520

Prior Year Awards

Improving Reproductive Management for Dairy Heifers to Manage Costs
Department of Animal Science, Cornell University  $75,000

Improving Crop Quality and Production Capacity for NYS Hop Growers
CCE Madison County $29,771

Sustainable Management of Root Weevil Populations for Improved Profitability
Department of Entomology, Cornell University $49,236

Using Precision Feed Management to Improve Profitability on Dairy Farms
CNY Dairy and Field Crops Team, Cornell University  $100,000

Improving Milk Quality by Understanding Environmental Pathogens in Different Bedding Types
Quality Milk Production Services, Cornell University  $100,000

Minimizing Wildlife Impacts on Yield and Food Safety Risk in Vegetables by Utilizing Repellency Tactics
Cornell University, $74,534

Corn silage hybrid evaluation -- new tools to improve decisionmaking, forage utilization, and efficiency of dairy farms
Cornell University, $148,570

Adoption of Controlled Release Nitrogen Fertilizer as a Best Management Practice in Potato Production
CCE Suffolk County, $90,620

Improving Farm Viability and Soil Health For Corn Producers with Cover Crop Interseeding
American Farmland Trust, $52,579

Increased Farm Profitability and Diversification Through Value-Added Forest Products
CCE Chenango County, $59,697

Impact of normalized yield on fall spring nitrogen recommendations for early planted winter forage
Advanced Ag Systems LLC, $57,757

Minimizing Wildlife Impacts on Yield and Food Safety Risk in Vegetables by Utilizing Repellency Tactics
Cornell University, $74,534

Corn silage hybrid evaluation -- new tools to improve decisionmaking, forage utilization, and efficiency of dairy farms
Cornell University, $148,570

Adoption of Controlled Release Nitrogen Fertilizer as a Best Management Practice in Potato Production
CCE Suffolk County, $90,620

Improving Farm Viability and Soil Health For Corn Producers with Cover Crop Interseeding
American Farmland Trust, $52,579

Increased Farm Profitability and Diversification Through Value-Added Forest Products
CCE Chenango County, $59,697

Impact of normalized yield on fall spring nitrogen recommendations for early planted winter forage
Advanced Ag Systems LLC, $57,757
Scouting and Action Thresholds Help Onion Growers Reduce Insecticide Use

Onions are big business in New York. The State ranks #6 in the country for production and growers sell more than $40 million worth of product annually. Ten years ago growers routinely lost 30-50% of their crop’s value to onion thrips. Since then, new insecticides have minimized loss. Unfortunately, the new products are expensive, and were being used almost weekly creating concern that thrips may build up resistance. Dr. Brian Nault has a solution.

In 2015 Nault, who is with the Cornell Onion Thrips Program, received a NYFVI grant to demonstrate that weekly scouting and the use of an action-threshold based insecticide program, could save growers money and help prevent insecticide resistance. As a result of his project 60% more growers used action thresholds, saving an average of $42 per acre, for a total of approximately $175,000 each year.

This project is well aligned with NYFVI’s strategic priority to “improve operational practices”. It demonstrates how incremental knowledge and refinement to production practices can reduce input costs. In this case, reduction of insecticide use to prevent insecticide resistance and other harmful off-target effects is also a strong benefit of the program.

Onion thrips (Thrips tabaci) damage onions by feeding on leaves, which reduces the size of onion bulbs. Previous research has established that onion plants can sustain a certain number of thrips before suffering economic damage. Onion growers can use this information to spray insecticides only when needed, or when their onion thrips populations reach an action threshold of one thrips per leaf.

Nault’s team of Entomologists and Cornell Cooperative Extension Vegetable Specialists recruited 16 onion growers representing five major onion growing regions in New York to participate in its pilot Integrated Pest Management (IPM) onion thrips program in 2015. A minimum of one onion field per onion grower was scouted weekly for onion thrips. Information on whether thrips infestation was above or below an action threshold was communicated weekly to the grower. Moreover, based on the level of thrips infestation, a recommendation on whether insecticide application was warranted and type of insecticide to use was communicated to the grower.

As a result of this information, participating growers using action thresholds made 30 to 50% fewer insecticide applications. This reduction saved those growers money, reduced harmful off-target effects and will slow the onset of insecticide resistance. Additionally, 30 or more growers were educated about the benefits of scouting and action thresholds through presentations and field days.

A post project survey of growers found that the majority plan to continue to use action thresholds to manage thrips.
NYFVI Projects:
Building Routes to Market and Improving Marketing Practices

Projects Completed 11/1/2016-10/31/2017
Promoting Participation in the Long Island Sustainable WINEgrowIng Program
Bedell Cellars $14,970
Defining Farmers Market Benchmarks to Improve Producer Profits
Farmers Market Federation of NY $36,222

Prior Year Awards
Practical Tools to Help Small Scale Livestock Producers Develop Profitable Customers
CCE Tompkins County $99,923
Developing Comprehensive At-Market Sales Data Collection Systems for Greenmarket Farmers
FARMroots, GrowNYC, $81,614.16
Supply chain analysis for emerging NYS malting barley industry
Cornell University, $33,190
Promoting Direct Local Seafood Marketing on Long Island through Community Supported Fishery (CSF) Programs
CCE Suffolk County, $64,977

Developing Human Capital

Strong management practices, and training and development of workers are critical in almost every industry. Farming is no different. Projects in this area of our portfolio strive to develop better managers and management practices, build business plans and ultimately, better bottom lines for all involved. Projects should deliver an impact in less than two years.

Projects Completed 11/1/2016-10/31/2017
Improving Workplace Communications: Opportunities for Worker Training and Advancement
Cornell University $100,000
Improving NY Livestock Farmers’ Profitability With Better Record Keeping and Financial Management
Hudson Mohawk RC&D Council $35,236
Developing Resources for New York Growers of Chinese Medicinal Herbs
High Falls Foundation, Inc., $42,614

Prior Year Awards
Teaching Farmers to Teach Others
NOFA-NY, $60,000
Creating a Win-Win for Long Island Wine Grape Growers

Sometimes a little money can go a long way. That’s what happened when Farm Viability invested just under $15,000 in the Long Island Sustainable Winegrowers organization to offer an online application and increase their membership.

Long Island Sustainable Winegrowers (LISW) program was established in 2012, by a group of growers banding together to provide leadership for sustainable growing practices on Long Island. The group believed that a certification standard would create a win-win opportunity for the industry. Eco-conscious consumers would be able to support participating vineyards and the industry would abide by consistent environmentally sound practices.

Richard Olsen-Harbich, of Bedell Cellars was part of the early group of growers that saw the potential of working together. He had seen similar efforts on the west coast and knew that consumers were seeking out sustainably grown wines.

In 2014, when Olsen-Harbich applied for funding, there were 2,800 acres of wine grapes being grown by 50 businesses. 12 of these businesses were LISW members representing 700 acres. With Farm Viability support the organization was able to improve its online tools and conduct more membership outreach. Today the organization has grown to 19 members and 1,200 acres.

LISW believes that sustainability as a science-based philosophy is the future—not just for grape growing but for all of agriculture. It’s extremely important to codify and define sustainable practices as well as having an inspection component to validate these techniques - both to other growers as well as consumers.

Acres certified by LISW follow 18 core criteria that prohibit or restrict certain pesticides, limit nitrogen fertilization, herbicides and encourage practices that reduce inputs that may threaten Long Island’s sole-source aquifer. The criteria were adapted from a statewide Vine Balance program developed by the College of Agriculture and Life Sciences at Cornell with funding provided by NYFVI.

New members are supported through educational outreach programs as well as mentorship. The project sponsored four educational meetings, with speakers from across the country. Critical to the ongoing success of the program is the support of the area’s largest vineyard management business that works with many of the area’s growers.

In the final report on the project, Olsen-Harbich provided a conservative estimate that these LISW certified wines were commanding 18 cents more per bottle. Based on enrollment numbers, that means that these certified growers are bringing in nearly $500,000 more each year. And with 1,200 acres following sustainable management practices, that’s a win for the aquifer as well!

“We believe that sustainability as a science-based philosophy is the future—not just for grape growing but for all of agriculture. It’s extremely important to codify and define sustainable practices as well as having an inspection component to validate these techniques - both to other growers as well as consumers. NYFVI helped us in getting the message out and to attracting new growers into the program.”

Richard Olsen Harbich
Winemaker
Bedell Cellars
2017 NYFVI Grant Recipients

Following are the projects that were funded through the “FVI” competitive grant program.

Incubating New Ideas
Application of electromagnetic electrical conductivity measurements for precision agriculture for NYS vegetable growers.
SUNY at Buffalo $84,840

Fostering Industry-wide Innovation
Improving Dairy Cow Health and Reducing Dairy Farm Labor Cost by Automating Health Monitoring and Management
Cornell University, $139,676
Improving Apple Grower Profitability Through Precision Management by Developing and Implementing a Smart App
Cornell University $127,297
Using NDVI Images to Guide Selective Harvest in Wine Grape Vineyards
Cornell University $126,775
Optimizing Variable Rate Seeding in NYS
Advanced Ag Alliance, Inc. $102,428
Biological Control of Corn Rootworm using Native NY Entomopathogenic Nematodes
Cornell University $99,979
Decision Agriculture: Managing Nitrogen and Yield in Corn and Forage Sorghum Utilizing Drone NDVI Imaging.
Cornell University $148,192
Trials to Reduce Onion Rot
Cornell University $119,715
Open Field Study with Avipel Shield Seed Treatment on Field Corn to Deter Birds from Feeding on Corn Seedlings
Cornell University $25,358

Improving Individual Farm Operations
Increasing Dairy Farm Profitability by Reducing the Interbreeding Interval and Optimizing Conception Rate of Lactating Dairy Cows
Cornell University $110,953
Optimize Selection/Management of Short Season Sorghum/Millet Varieties for NY
Advanced Ag Systems, LLC $39,366
Evaluation of Alternatives to Chlorpyrifos Insecticides for Controlling Cabbage Maggot in Brassica Vegetables
CCE Suffolk County $38,135
Development of Effective Spray Program for Post-Infection Fire Blight Management in Apples and Cost-Benefit Analysis of its Key Components
Cornell University $149,950

Building Routes to Market and Marketing Practices
Equine Small Business Development
Jefferson Community College/ SUNY $7,480
Scaling Up: Developing New and Additional Wholesale Enterprises with Greenmarket Farmers
FARMroots, GrowNYC $123,944

Developing Human Capital
Dairy Workforce Online Educational Program.
Cornell University $16,652
New York is fortunate to have such a broad range of agricultural products produced in the state. One of the strengths of Farm Viability is our focus on funding the best proposals received in any given year. In 2017, we received a large number of stellar field crops proposals, while in 2016 vegetables rose to the top. The chart above illustrates how the funds were awarded among commodity areas.

Projects in the “general” category help farmers in two or more commodity areas. Projects labeled as “niche” refer to the size of the market, for example the equine project funded with Jefferson County Community College.