New York State
Integrated Pest Management Program

The year in review

2019—2020

Cornell Cooperative Extension
Director’s Message

This past May I had the honor of becoming director of the New York State Integrated Pest Management Program—a once-in-a-lifetime opportunity to work with some of the best IPM Educators in the United States. Since day one, I’ve been committed to promoting adoption of ecologically-based pest management practices, expanding our knowledge and capabilities in predictive and precision pest management, heightening public awareness and engagement on invasive species issues, and, by consistent messaging, increasing the public’s understanding of what IPM means.

We face significant challenges. Climate change is straining agricultural, urban, and natural ecosystems where pests are becoming more resilient, and invasive species are finding suitable conditions to survive and expand their range. In response, our pace of innovation is faster than ever. Pest monitoring and forecasting using digital tools is moving us into the future. The general public is eager to understand how their food can be produced with fewer risks to people and the environment. We’re building ecological resilience by using beneficial organisms and by increasing the complexity of the systems that better withstand pest challenges. Just as important, cultural diversity is seen as a strength by which we increase IPM across the state.

This year’s report highlights our team’s efforts in every avenue of IPM adoption. That outlook has never been so bright. We invite you to help us shape the IPM program for the future.

Alejandro Calixto, Director

Our Partners

“Eliminating the impact of pests in agricultural and community settings requires science-based strategies. DEC partners with the Cornell University-based New York State Integrated Pest Management Program to develop innovative ways to manage pests that minimize potential environmental, health, and economic risks. Studying the effect of pests on human health, property, and agriculture, the program develops tested methods to manage pests that are reducing the use of conventional pesticides.”

Commissioner Basil Seggos, NYS Department of Environmental Conservation

“The Integrated Pest Management Program continues to be critical to the success of the agricultural industry in New York State, helping to increase the viability and profitability of our farms while safeguarding New York’s precious farmland and natural resources. Farmers and homeowners benefit from implementing IPM methods, which protect crops and plants from insects, plant diseases, and weeds. We look forward to continuing our partnership with the IPM Program to help farmers increase yields, improve water quality, and cut costs.”

Commissioner Richard Ball, NYS Department of Agriculture and Markets

Highlights of 2019–2020

Pepper Problems Don’t Have to Prevail!

In an effort to improve growers’ understanding of cultural practices, host plant resistance, and use of biological or chemical controls, Vegetable IPM Extension Area Educator Marion Zuefle ran one-on-one IPM field demonstrations with three New York farmers in 2019. Her initial interviews pointed to typical pepper pests like aphids, thrips, mites, European corn borer, and diseases like Phytophthora and bacterial leaf spot.

Results of her weekly scouting and trapping were quickly shared with growers, and when disease showed up, samples went to Cornell for identification. Detection of Xanthomonas, a bacterial leaf spot disease, came too late for pre-season IPM options but put growers on alert for future use of early preventative sprays, or minimum three-year field rotations of pepper and tomato crops.

Speaking of rotation, it’s always recommended for Phytophthora, a stubborn soil disease. When that can’t be done, growers depend on raised beds, resistant varieties, and preventative fungicides.

As for insect pests, a history of European corn borer prompted the use of pheromone traps for monitoring. Because numbers were below threshold, no sprays were needed. That year, thrips and cyclamen mites weren’t a problem either, but as growers know, every year presents its own challenges.

The benefits of on-farm demonstrations cannot be ignored. Increased skill in pest identification, pest prevention, and use of thresholds guide management decisions. And in the case of these three growers, IPM led to an above average harvest and increased peace of mind.

Project Leader: Marion Zuefle

Pepper infected with Phytophthora.

2019 Projects

All projects were funded, in part or in full, by the New York State IPM Program. We leveraged additional funds from outside sources. Please find the project reports at ecommons.cornell.edu/handle/1813/41245.

NYSIPM Program Funding 2019–2020

In fiscal year 2019-2020, New York State provided the New York State IPM Program $1,000,000 for Agricultural IPM, $550,000 for Community IPM, and $50,000 for Tick IPM. We were further supported by $285,000 in competitive federal funding through USDA-NIFA’s Crop Protection and Pest Management Extension Implementation Program (grant no. 2017-70006-27142), and several smaller grants secured by staff.

Cornell Cooperative Extension

The NYSIPM Program develops and supports an integrated, science-based approach to risk reduction in agricultural, urban, and natural environments. The pest management stories in this report showcase our efforts.

Front cover: An interseeded cover crop just starting to take root in corn. Cover crops may hold the key to control of herbicide-resistant weeds. See Cover Crops to the Rescue!
Biopesticides Have a Place in IPM

Biopesticides are pesticides whose active ingredients are natural, such as microorganisms, plant extracts, and other substances found in nature. Compared to conventional chemical pesticides, they may pose lower risks to humans and the environment. It’s no secret that IPM is all about reducing those risks while effectively managing pests, so with increasing biopesticide availability, the question is: do they work?

In collaboration with Cornell’s Crystal Stewart, Elizabeth Buck, and Margaret McGrath, and with funding from the New York Farm Viability Institute, our Biocontrol Specialist, Amara Dunn, set out to answer this question specifically for a tough adversary—powdery mildew on cucurbits like pumpkins and cucumbers.

Their cucurbit powdery mildew trials suggested that farmers should not simply add biopesticides to their regular fungicide applications, but should consider replacing some conventional fungicides with biopesticides.

Word got out. Approximately 775 growers attended 18 presentations, and more than 3,300 people were reached through 14 publications on blogs, in newsletters, and elsewhere. Examinations of two years’ worth of field trials showed growers what biopesticides are, how they work, and how to maximize their effectiveness.

After results were shared at winter meetings, 33% of growers planned to start using biofungicides to manage cucurbit powdery mildew, while 76% reported increased understanding of their potential. Perhaps most promising: 11% of growers plan to replace conventional fungicides with biofungicides on a total of 413 acres of cucurbits. Their intent to reduce conventional fungicides could save between $10-$24K each year. For the rest of us, this means good news for human health and the environment.

Project Leader: Amara Dunn

Good News for Growers and Bees

Over the last 25 years, Douglas-fir trees have been the backbone of New York’s Christmas tree industry. Well-loved by buyers for sturdy branches, soft needles, and needle-retention, this popular tree is appreciated by growers for its quick growth, adaptability to various soil conditions, and tolerance of increasingly hot summers. Lately, however, some Christmas tree farmers are moving away from Douglas-fir because of a needlecast disease requiring management by fungicide applications. Others continue to plant it—sprays and all—due to its resistance to deer damage, and its resilience in a changing climate.

NYSIPM research over the last five years has shown that timing of sprays greatly affects a treatment’s efficacy. In fact, there’s evidence that repeated applications yield no greater control than one or two well-timed sprays. Armed with this knowledge, growers are beginning to adopt a reduced-spray practice while still producing beautiful, healthy trees.

Our work didn’t stop there. Cornell entomologists recently determined that chlorothalonil, the most effective fungicide to control Douglas-fir needlecast, can be toxic to pollinators. Duly concerned, NYSIPM’s Brian Eshenaur and Betsy Lamb conducted a field study of spray alternatives. While none were as effective as chlorothalonil, the research found that treatments with a novel soil-applied fungicide were very effective and could be an important tool to help manage needlecast disease. We’re encouraged by these initial results and plan further research to bring this new option to New York tree producers.

Project Leaders: Brian Eshenaur and Elizabeth Lamb

Two Decades of Forward-thinking Floriculture: For as long as there has been an Ornamentals component at NYSIPM, we’ve educated growers in methods to reduce pests while limiting pesticide use. To evaluate adoption of IPM practices by New York State greenhouse floriculture growers, surveys were conducted in 2000, 2007, and 2019.

The 2000 and 2007 surveys showed that certain IPM practices are common—over 90% of growers removed weeds and diseased plant materials from the greenhouse, scouted, and identified diseases and insects before controlling them. Other practices, however, were done infrequently, showing the need for additional training. We acted. Starting in 2008, we held annual IPM In-Depth programs and took hands-on demonstrations on the road around the state. 2019 survey results show that growers are now more likely to consider monitoring salt levels using soil and foliar analysis, use trap or banker plants, participate in grower-to-grower networks, and consult trained Extension educators. And the recorded increase in the use of beneficial predators and parasitoids suggests a potential reduction in pesticides.

Most importantly, the relationships begun through these IPM interactions keep New York State blooming.

Project Leader: Elizabeth Lamb
Intensive Apple IPM
Innovative orchard systems, new apple varieties, and decades of amassed apple IPM knowledge warranted a new delivery method to an already outstanding apple industry. The new Apple IPM School, created in 2019, did just that, thanks to a Cornell Cooperative Extension grant that offset costs for an eight-hour workshop at the 2020 Empire State Producer’s Expo.

Presenters from Cornell Cooperative Extension and Cornell AgriTech—Art Agnello, Mike Basedow, Juliet Carroll, Kerik Cox, Grace Marshall, Lynn Sosnoskie, and Janet van Zoeren—highlighted four key components of effective apple IPM: IPM for a Healthy Crop; Insect Targets and IPM Tactics; Diseases and IPM Defenses; and Wildlife, Weeds, and the IPM Wrap-up.

Attending growers came away with apple IPM at their fingertips through a 100-page workbook and a USB drive filled with apple IPM wisdom. These same resources are now available on the NYSIPM Program website (tinyurl.com/y525w56o), allowing growers access to new or refresher training.

With nearly 70 people receiving a Certificate of Completion, attendance expectations were exceeded by an incredible 35%. Our audience comprised farm owners, farm managers, independent private consultants, agrichemical company personnel, cidery owners, and crop insurance personnel. They engaged in interactive learning software using smartphone Q&A, a process that allowed both immediate results and the chance for presenters to later assess learning outcomes. At day’s end, over 90% responded with intentions to use at least three key IPM tactics on their entire farm. Organizers see opportunities for additional workshops on sprayer technology, scouting records, using pest forecast models, and biological control. Not surprisingly, both growers and presenters hope Apple IPM School will be in session again soon.

Project Leader: Juliet Carroll

Staying Vigilant Against the Soybean Cyst Nematode
The soybean cyst nematode (SCN) is the number one pest of soybeans nationally, potentially causing 10-30% yield losses in infested fields. In 2017, an estimated 109 million bushels were lost nationwide. SCN was first confirmed at low levels in Cayuga County, New York, in 2016. Since then, the NYSIPM program has led statewide survey efforts to identify the extent of infestations.

In 2019, our partnership with New York State Department of Agriculture and Markets, and the inclusion of SCN testing in a CAPS* survey revealed seven infested fields in six new counties—a huge cause for concern. This prompted the New York Corn and Soybean Growers Association to fund tests of 100 additional fields in 2020—tests that revealed an additional 23 positive counties. With 30 New York counties now facing SCN damage, the time for active management is here.

It’s not all soybean doom. Through training events and press releases, stakeholders learn how to stay ahead of this pest. Once growers and certified crop advisors understand the risks, and tools such as monitoring, they have appropriate and profitable IPM practices to combat crop losses. For low SCN populations, basic crop rotations and planting and rotating SCN-resistant varieties are more cost-effective than chemical options—good news in the face of this invasive pest. By instructing growers on how to manage soybean cyst nematode sustainably, we plan to prevent it from becoming the number one pest of New York’s soybeans.

Project Leaders: Jaime Cummings and Ken Wise

*Coplaner Agricultural Pest Survey

Maps illustrate SCN survey efforts in 2016, 2019, and 2020. Counties in green tested negative for SCN, while counties in red tested positive.

Cereal leaf beetle (CLB), a significant pest of wheat and barley, is typically controlled with insecticides. Timely scouting of CLB populations and spraying according to economic thresholds is an important IPM approach. Significant control could be possible with the use of a natural predator, the CLB larval parasitoid wasp, *Tetrastichus julies*. In Washington State, this parasitoid has nearly eliminated the need for insecticide sprays for CLB.

Can a robust parasitoid population provide similar results here? Our multi-year research project goals include surveys and releases, and to increase parasitoid populations by establishing multiple on-farm field insectaries around the state. Small grains farmers are excited about this biocontrol option and are highly interested in the cost-savings associated with potential reductions in necessary pesticide applications.

Project Leaders: Jaime Cummings and Ken Wise
**Ticks and Tick-Borne Diseases in New York**

It’s more than the furtive crawling and sucking. Multiple tick species can carry multiple diseases. Prompted by an increasing number of tick-borne disease cases, Jody Gangloff-Kaufmann, Joellen Lampman, Elizabeth Lamb, and Matt Frye participated in an active surveillance project to determine risks to New Yorkers, their pets, and livestock.

With the use of tick drags, these annoying arachnids were collected from school yards and suburban parks in Eastern New York and Long Island. Site conditions were noted in detail before ticks were submitted to Cornell’s Animal Health Diagnostic Center. The lab identified blacklegged ticks (primarily), dog ticks, and the newly invasive Asian longhorned tick. Disease pathogens included Lyme disease, anaplasmosis, babesiosis, *Borrelia miyamotoi*, Powassan virus, and rickettsia. Some ticks carried multiple pathogens.

Bottom line? Be vigilant. Schools should continue to monitor borders between play areas and woodlots—contact us for help developing a plan! Incidence of tick-borne diseases were similar across the assessed areas, however Powassan virus is more widely distributed across Long Island than previously known. This study confirmed ticks in nearly all Nassau County parks and preserves. Be assured that NYSIPM is working relentlessly to increase awareness and reduce risk of tick-borne diseases.

**Project Leaders:** Jody Gangloff-Kaufmann, Joellen Lampman, Elizabeth Lamb, and Matt Frye

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**Cover Crops to the Rescue!**

Home gardeners are well aware of the weed suppressive benefits of mulch. It turns out that farmers can inexpensively mulch a 200-acre soybean field too … by growing the mulch in place. That involves establishing a big hearty cover crop and then rolling it down so the dead leaves and stems act as a mulch.

Our Integrated Weed Management Specialist, Bryan Brown, participated in such a project with Cornell researchers Sarah Pethybridge, Matthew Ryan, and Julie Kikkert. They found excellent weed suppression by rolling a cereal rye cover crop into mulch prior to planting soybeans. Cover crops benefit soil health and, in this case, research showed a bonus of reduced incidence of white mold, a persistent soybean disease.

But would a cover crop mulch suppress our nasty new herbicide-resistant weeds? Bryan thinks so because these weeds tend to have tiny seeds which lack the stored energy needed to push through mulch. Through a New York Farm Viability Institute project that he leads, Bryan tested the suppressive effect of mulch on one of New York’s most problematic weeds, herbicide-resistant tall waterhemp. He found a control rate of 87%—good enough to avoid a yield loss on its own or be used in conjunction with alternative herbicides for even greater control.

It can be challenging for farmers to squeeze a cover crop into their rotation, so some are using a new practice to plant cover crops between rows of young corn, a year in advance of soybeans. This practice, called interseeding, allows the cover crop to grow rapidly when the corn is harvested. But some soil-applied herbicides used to regain control of herbicide-resistant weeds can injure the interseeded cover crops. So Bryan and project co-leaders Mike Hunter, Jeff Miller, Mike Stanyard, and Venancio Fernandez tested many of these soil-applied herbicides for cover crop injury and found several that are compatible. More good news for farmers who want to gain the benefits from cover crops while maintaining excellent control of herbicide-resistant weeds. As a result of this project, over 50 New York farmers have indicated intent to try this new practice.

**Project Leader:** Bryan Brown

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**NEWA’s Economic Benefits**

“The only constant in life is change,” said one ancient philosopher, and anyone watching our fickle climate. That’s why sensor technologies and data science innovations used by the Network for Environment and Weather Applications (NEWA) make NYSIPM an industry leader in tackling real-world pest problems.

First launched in 1996, NEWA (newa.cornell.edu) collects and integrates remote weather station data into an online platform of decision-support resources. Designed by Cornell researchers and meteorologists, there are presently 42 unique tools using near real-time environmental data to inform fruit and vegetable management decisions.

A 2017 survey showcased the economic benefits of NEWA-configured weather stations and using NEWA tools. Growers averaged annual savings of more than $4,000 in avoided sprays, and prevented crop losses of $33,000. No wonder our website visits are up 41%. NEWA’s reliability, partnerships, and return on investment are a proven value.

Outreach and education are central to the NYSIPM mission, making NEWA an important conduit for direct support of agricultural best practices. In fact, more than 6,450 contact hours were achieved by 2019. NEWA’s online content and crop guidance remains key to new cross-commodity efforts, and promises economic and environmental benefits for even more New Yorkers.

**Project Leaders:** Dan Olmstead, Juliet Carroll, Abby Seaman, Elizabeth Lamb, and Jaime Cummings
Retirement for Lynn Braband = More Time Outdoors

Statewide, regionally, nationally, and even internationally, Lynn Braband made things happen by sharing his passion for healthy communities and the environment. Often found doing on-site scouting for pests during visits to school districts, Lynn's reputation as an all-around naturalist and reliable, genial collaborator prevailed.

After a Master's in Wildlife Biology, Lynn worked in the wildlife control industry before joining the IPM Program. He is a member of The Wildlife Society, Sigma Xi, American Scientific Affiliation, National Pest Management Association, National Wildlife Control Operators Association, New York State Wildlife Management Association, and the New York State Wetlands Forum. Add to that his dedicated service on the National School IPM Steering Committee, the International IPM Symposium Program Committee, the IPM Program Work Team, Rochester Healthy Home Coalition, the Statewide School Environmental Health Steering Committee, and foremost, his co-leadership of the Northeast School IPM Working Group.

Working with school staff around the state led him to applied research on reducing the risk of yellow jacket stings at schools, and keeping geese off playing fields. He has spoken on bird management, critters on golf courses, reducing bed bugs in childcare centers, and White Nose Syndrome on bats. We counted more than 150 publications, and over 50 public presentations just since 2012!

Two in-depth New York school surveys were personally guided by Lynn—it was just a part of his deep commitment and relationship-building with building and property managers, and with BOCES health and safety officers.

Jennifer Grant, former NYSIPM Director, summed it up: “Lynn's steady commitment and patient persistence have been the underpinnings of his success in getting IPM implemented. That approach, along with his vast knowledge of wildlife biology and regulations, as well as his friendly demeanor, all combine to make it easy and enjoyable to cooperate with Lynn. Throughout his career, Lynn has also shown a strong interest in the ethics of science and pest management. He shares his musings with others, causing us all to think. Thanks for everything Lynn!”

Retired IPM Director Jennifer Grant's Legacy is Passion, Knowledge, and Leadership

Throughout her Cornell career and until her May 2020 retirement, Jennifer's devotion to expanding and promoting IPM has made the full list of her accomplishments too long to include here.

Let’s start with Jennifer’s co-authoring of Reducing Chemical Use on Golf Course Turf: Redefining IPM, and creating the Environmental Impact Quotient evaluation method for pesticide use on golf courses (please see nysipm.cornell.edu/eiq/). Later, she coordinated and cowrote the Best Management Practices for New York State Golf Courses, and organized development of the Cornell Commercial Turfgrass Guidelines. She had a key role in comprehensive profiles for minimum-risk products, and in helping to make NEWA (the Network for Environment and Weather Applications) a reality.

Jen won the Northeastern IPM Center’s Award for Outstanding Achievements in IPM, and her work with the Northeast Region Technical Committee on IPM garnered an Award for Excellence in IPM from the Entomology Society of America. More recently, she was part of a team awarded the CALS Outstanding Accomplishments in Extension/Outreach Team Award for Protecting Pollinator Health. Jennifer's passion for encouraging IPM adoption expanded our program’s partnerships with our state’s Departments of Agriculture and Markets; Parks, Recreation and Historic Preservation; and Environmental Conservation. Our relationships with Cornell faculty and Cooperative Extension, state legislators, and multiple industry contacts grew stronger.

Throughout her years as a supervisor, coordinator, co-director, and as sole IPM director, Jennifer led our staff with a consistent strength and grace that inspired both strong individual efforts and strong team cohesiveness. By expecting the best from her staff and caring for them as friends, her example must be considered key to the program's success. Numbers, like reductions in pesticide applications, show improvement, but Jen’s passion for IPM changed minds. We will miss her direct, yet congenial way of providing information and encouragement, and we celebrate her part in increasing IPM awareness statewide and nationally. Thank you, Jennifer!

Jen’s years of collaboration with Cornell’s Dr. Frank Rossi and Bethpage State Park’s Andrew Wilson led to great advances in turfgrass IPM and reduced environmental impact on New York’s golf courses.

We had no photos of Lynn at his desk, but plenty of him doing hands-on (sometimes on-the-floor) inspections of the many places pests enter buildings in search of habitat. As he’d often say, “Pest exclusion is the first line of defense.”
In 2017, tiny white worms—larvae of spotted wing drosophila (SWD)—meant tons of tart cherries were rejected by processors. Enter IPM. We set traps to monitor spotted wing’s arrival and tailored spray programs to protect orchards. In particular, later-ripening cherries along Lake Ontario suffer longer exposure to spotted wing, up to six weeks longer, than inland orchards. A perfect SWD storm.

Since 2018, growers understand the risks. An informed IPM approach against spotted wing protects tons of tart cherries, valued at $2.5M, from tiny white worms. Project Leader: Juliet Carroll.