

**NEERA 2104: Northeast Region Technical Committee on  
Integrated Pest Management**

**April 30, 2024 @1 – 4 PM EDT Virtual Meeting**

**<https://cornell.zoom.us/j/93002965404?pwd=M24xMGFKTmJXb0htSXJDS0Q0cHQ5Zz09>**

**Meeting ID: 930 0296 5404**

**Passcode: 384555**

**Agenda**

**1:00 PM Welcome & Introductions; NEERA Chair, Lisa Tewksbury**

**1:05 PM Margaret Smith, Admin Advisor to NEERA 2104**

**1:20 PM State Report Highlights**

Please select a few key accomplishments, events, or issues that you would like to highlight from your state, aiming to stay within 5-10 minutes for each state including time for Q&A. Send your written reports to Lisa Tewksbury [lisat@uri.edu](mailto:lisat@uri.edu) for compilation into the regional report for NEERA 2104 by Friday May 31, 2024.

**Order of State Reports:**

RI/URI (Lisa Tewksbury); VT/UVM (Sarah Kingsley-Richards); NY/Cornell (Alejandro Calixto); NH/UNH (Amber Vinchesi-Vahl); MD/UMD;; ME/U. Maine (James Dill); MA/UMass (Susan Scheufele); CT/UCONN (Victoria Wallace); DE/U. DE (David Owens); NJ/Rutgers (George Hamilton); PA/Penn State (John Tooker); WV/WVU (Rakesh Chandran)

**3:20 PM Northeast Center Update, Deb Grantham (and plan next year's NEERA meeting?)**

**3:40 PM Additional Discussion – EPA update on pesticide program from Andrea Szylvian**

**4:00 PM Adjourn**

**Margaret Smith** - Administrative Advisor to NEERA 2104 – acts as a liaison between this group and the Ag experiment station directors under which these coordinating committees like this one function. She reviewed the information that would be required to be included in the annual report for NEERA 2104, due in two months. It will need to pertain to the objectives of the coordinating committee, which are: information sharing, prioritizing needs, facilitating cooperation and multi-state research and extension, representing northeast IPM to Federal and state agencies, collaborating with and advising the northeast IPM center, and communicating and representing northeast IPM to other regions and nationally.

**Mike Webb** – Reiterate that the Northeast IPM center has a newsletter (IPM Insights) and a weekly roundup email newsletter in which our articles for our states could be republished if they could benefit others outside our state, but within the region.

**Deb Grantham** – Updated on the status of CPPM funding, location and timing of next year’s NEERA Meeting (mid-March and either virtual, or in person at the International IPM meeting in San Diego with a virtual option for those not attending – doodle poll to set up the meeting done in Nov. – Dec.).

**Andrea Szylvian** - US EPA Region 1 – Provided updates to the regulations that pertain to the certification and training of certified pesticide applicators (40 Cfr Part 171), and the Endangered Species Act. They are working on herbicide, then insecticide, and then fungicide strategies. There will be new label language as it pertains to the invasive species act, and it will be a rolling process as products get re-registered.

**Meeting ended at 3:11 PM.**

**Written State Reports in Alphabetical Order:**

## **Connecticut IPM Program Report, NEERA Meeting 2024**

Prepared by Victoria Wallace, IPM Program Team Leader

The 2023 IPM Program Team included Shuresh Ghimire (vegetables and hemp), Nick Goltz (plant pathology/diagnostics), Ana Legrand (vegetable entomology), Evan Lentz (fruit), Rosa Raudales (greenhouse), and Victoria Wallace (school, invasive, pesticide safety, pollinators, turf and landscape).

**For more detailed information, please review our 2023 Annual IPM Report on the UConn IPM website: [ipm.cahnrc.uconn.edu](http://ipm.cahnrc.uconn.edu)**

Integrated Pest Management applies multiple tactics in a variety of settings through the selection of appropriate tools and the education of agricultural industry members and Connecticut citizens to provide sustainable, science-based approaches for the management of plant pests (insects, mites, diseases, wildlife, and weeds, including invasive plants). The UConn IPM Program incorporates all possible pest management strategies through knowledgeable decision-making, utilizing the most efficient landscape and on-farm resources, and integrating cultural and biological controls. Program objectives include maintaining the economic viability of agricultural and green industry businesses, enhancing and conserving environmental quality and natural resources, educating participants on the effective use of biological control agents, and educating pesticide users about the safe use and handling of pesticide products.

### **Accomplishments and Impacts**

- The Fruit IPM program engaged 581 fruit growers and related industry members 30 times through ongoing e-updates, which include phenology, weather, pest management, cultural management, and meeting/event updates.
- A new Fruit IPM Internship Program was developed to assist in the ongoing statewide fruit pest scouting and trapping efforts, including monitoring of important invasive species: Brown Marmorated Stink Bug, Spotted Wing Drosophila, and Spotted Lantern Fly.
- Vegetable Integrated Pest Management education was delivered to over 600 vegetable growers and stakeholders every week from April to October 2023 through 21 weekly vegetable pest alert emails focusing on pests, pest management and decision making, and safe pesticide use.
- 285 attendees participated in the UConn Native Plants and Pollinators Conference at the University of Connecticut in Storrs, CT, which provided education about pollinator biology and conservation, as well as using native plants in the landscape to create aesthetically pleasing gardens that also support pollinators. Based on conference evaluations (n=180), attendee knowledge of presentation topics increased from an average of 2.8 (on a scale of 1 to 5, with 1 being no knowledge and 5 being great knowledge) before the conference to an average of 4.3 after the conference. 96% agreed that the conference provided practical, useable ideas and that the symposium was well organized.
- The UConn Plant Diagnostic Laboratory (PDL) processed 265 physical samples. Additionally, the lab directly responded to at least 320 stakeholder plant health inquires via phone, email, and walk-in. The lab also directly supported the efforts of the UConn Home & Garden Education Center (HGEC), which responded to more than 1,909 additional stakeholder inquiries in 2023.

- The UConn Ornamental and Turf Short Course provided the necessary information for participants to fulfill the requirements of the Ornamental and Turf/Golf Course Superintendents State of Connecticut Supervisory Pesticide Applicator Certification exam. The online winter session ran from January-March (73 attendees), and a fall session ran from October-early December (63 attendees).
- 110 turfgrass professionals, including municipal and grounds managers, attended a UConn School and Municipal Turf/Grounds Workshop. 95% of attendees agreed that the workshop provided practical ideas for turf and landscape management. 96% of attendees said that they are more knowledgeable about grounds management options because of the program. 100% of evaluation respondents rated the programs as good or excellent. Attendees knowledge about CT School IPM increased from 2.9 before the conference to 4.40 after (on a scale of 1-5).
- Fifty-three students enrolled in UConn's online Vegetable Production Certificate course. The course had seven modules, each module with a self-paced video, supplemental materials, and a short quiz. In the post-course evaluation survey (N = 53, n = 40), respondents indicated their knowledge of the subjects increased from an average of 51% before the course to 80% after the course.
- The 2023 UConn Extension Vegetable and Small Fruit Growers' Conference and Tradeshow welcomed 194 participants and 27 trade show exhibitors. Of forty evaluation respondents, 73% reported they definitely earned something new that will help with their business, while 20% reported they possibly learned something new.
- Sixty-three attendees from CT and MA participated in an UConn Ornamental Greenhouses conference. 100% of evaluation respondents stated that they learned skills that would help them with the diagnosis of plant diseases.
- At least 5,345 citizens directly and actively participated with CT Invasive Plant Working Group through invasive plant talks, symposiums, exhibits, and management activities in over 60 CT towns. Many (at least 4,670) were reached indirectly through articles, YouTube videos, social media, fact sheets, signs, and other educational mediums. A minimum of 30,765 hours were directly invested in invasive plant management, during intensive invasive plant training sessions and management activities, as well as educational outreach. A minimum of 5,300 hours were provided indirectly as citizens engaged in educational efforts and learned from videos, articles, and fact sheets.
- There were 83,457 users of the IPM website ([ipm.cahnrc.uconn.edu](http://ipm.cahnrc.uconn.edu)). The total number of page views was 123,028.

### Publications

- de Almeida, A. L., I. Upadhyaya, **S. Ghimire**. 2023. Producer survey on agricultural water and flood impact on crop food safety in Northeastern US. National Consortium for Produce Safety, St. Louis, MO. Nov 7-9 2023.
- **Goltz, N.C.**, 2023. "Warm, Wet Weather Puts Plants at Risk." *University of Connecticut Ladybug Blog*. <https://uconnladybug.wordpress.com/>
- Ng, M. and **Ghimire, S.** 2023. [Climate adaptation tactics in vegetable production](#). UConn Extension and Department of Plant Science and Landscape Architecture- Crop Talk newsletter 19(3):5-9.

- **Legrand, A.** 2023. Sticky Situations in Pest Monitoring: Pest or Beneficial Insect? Crop Talk Newsletter 19(1): 2-3. UConn Extension and Department of Plant Science and Landscape Architecture. <https://ipm.cahnر.uconn.edu/wp-content/uploads/sites/3216/2023/04/Crop-Talk-April-2023-6.pdf>
- **Lentz, E.** 2023. Blueberry Weed Management Quick Guide. [ipm.cahnر.uconn.edu](http://ipm.cahnر.uconn.edu)
- **Lentz, E.** 2023. Fireblight Resistance Management – [CT IPM Crop Talk Newsletter](#), 19:1.
- Picone, P., **V. Wallace**, A. Siegel-Miles, and S. Tomis. 2023. Native Tree and Shrub Availability List. 12 pp. [ipm.cahnر.uconn.edu](http://ipm.cahnر.uconn.edu)
- Pundt, L., C. Caballero and **R. Raudales**. 2023. A Sticky Subject: Yellow Sticky Cards. E-Gro Alert. August 2023. 12 (32) 4 pp. <https://e-gro.org/pdf/2023-12-32.pdf>
- **Raudales, R.**, L. Pundt, C. Caballero. Produced 10 training videos in Spanish and English and uploaded to The UConn Greenhouse Channel on YouTube (874 subscribers). <https://www.youtube.com/channel/UCJbcMQSF8bqpuzNiGUPweTw>
- Shrestha, S., L.W. DeVetter, C. Miles, J. Mejia-Muñoz, P. Krone, M. Bolda, and **S. Ghimire**. Building agricultural knowledge of soil-biodegradable plastic mulch. HortTechnology, 33(5):455-463. <https://doi.org/10.21273/HORTTECH05248-23>
- **Wallace, V.** and A. Siegel-Miles. 2023. Best Management Practices for Pesticide-Free Landscape Maintenance on CT School Grounds. 54 pp. [ipm.cahnر.uconn.edu](http://ipm.cahnر.uconn.edu)
- Wallace, V. (Contributing author). 2023. Best Management Practices for the Sports Field Manager: A Professional Guide for Environmental Sports Field Management. New England Sports Turf Managers Association. 156 pp. [nestma.org](http://nestma.org).

**Delaware State IPM Report  
Regional IPM Meeting (NEERA 1604)**

June 21, 2024

**IPM Team Members**

Mark VanGessel – Extension Weed Science  
Alyssa Koehler – Extension Plant Pathology  
Brian Kunkel – Extension Entomology,  
Horticulture  
Rose Ogutu – Horticulture Specialist, DSU  
David Owens – Extension Entomology,  
Agriculture  
Carrie Murphy – Lawn and Garden Program  
Leader, Ag Team Leader

James Adkins, Irrigation Specialist and Ag  
Team Leader  
Emmalea Ernest – Extension Fruit and  
Vegetable Program  
Deborah Delaney - Apiculturalist  
John Emerson – Pesticide Safety  
Coordinator and Turfgrass extension agent  
Jill Pollok – Plant Diagnostician

**General Comments and Current State**

The Delaware IPM extension team includes personnel from the University of Delaware and Delaware State University. Delaware IPM extension activities are funded through state grants, specialty crop block grants, grower commodity boards (ex. Delaware Soybean Board, Maryland Grain Production Utilization Board, Mardel Watermelon Association, Pennsylvania Vegetable Marketing and Research Program), Northeast SARE, Northeast IPM Center, and USDA-NIFA's CPPM program. DE Cooperative Extension serves stakeholders through demonstration trials, pest scouting, and research to provide guidance on practices of interest to our producers, and traditional and innovative knowledge transfer. Besides traditional pest management, our extension team members are also involved in investigating practices that may yield plant health benefits, or, conversely, not yield benefits touted by industry to farmers. Through our activities, we reach a great proportion of DE farmers, and many farmers and consultants in adjacent states, providing real-time pest updates and guidance as well as scientifically based assessments of management changes. In addition, The UD extension team has been strengthened by increasing the capability and impact of our Pesticide Safety and Education Program.

**Major research and extension activities included:**

Agronomic and Specialty Crop IPM

1. Evaluation of herbicide resistance across Delmarva in Italian rye grass (w/ UMD): Approximately 45 samples were collected in the spring of 2023 from Delaware and the eastern Shore of Maryland. There was enough viable seed from 41 samples to run test for glyphosate resistant, and all samples were susceptible to glyphosate.

Further testing is ongoing for Group 1 and Group 2 herbicide resistance. Palmer amaranth samples are being collected in the summer/fall of 2024 and resistance to common corn herbicides will be screened.

2. Evaluation of insecticide resistance in corn earworm and striped cucumber beetle
3. Ongoing evaluation of biofumigant mustards
4. Demonstration and evaluation of short corn varieties
5. Soybean Prophylactic Insecticide Demonstrations (5 sites)
6. Cover Crop Impacts to Slugs (5 sites)
7. Surveyed 6 alfalfa fields for alfalfa weevil
8. Insect trapping network (10 sites; CEW, BSB, GSB, BMSB, ECB)
9. San Jose Scale in tree fruit (3 sites)
10. Seedcorn maggot Peas (7 sites)
11. Slug natural enemy surveys (9 sites)

#### Pollinator Health

1. Queen Rearing Workshop – teach local beekeepers how to raise own local stock. June 12-23. 10 participants.
2. Treatment Workshop – demonstrate Varroa sample and treatment methods

Plant Diagnostic Clinic: 884 samples processed by the clinic in 2023. 82% from Delaware, 10.5% from Maryland, 6.2% from Pennsylvania, and the remainder from Virginia, New York, and New Jersey. Of note, 18% were for vegetables, 10% from fruit crops, 11% from agronomic crops.

#### **Major extension events and outputs included:**

1. Weekly Crop Update – UD's weekly pest and crop advisory continues to be successful and reaches over 1000 unique email addresses. Issues run regularly from April to September; <https://sites.udel.edu/weeklycropupdate/>.
2. Ornamentals Hotline – weekly newsletter reaching approximately 200 landscapers and other green industry professionals; <https://sites.udel.edu/ornamentals-hotline/archive/>.
3. Delaware Agriculture Week January 2024
4. MidAtlantic Crop Management School, November 2023
5. Landscape pest walks (New Castle County, Sussex)
6. Syngenta's Pest Patrol

#### *Meetings and Field Tours*

1. Multiple county extension meetings including a field demonstration on August 9 of insect pest management, corn foliar diseases, short stature corn comparison, biomechanical stalk strength testing ([https://www.youtube.com/watch?v=by9iEMnr7lg&list=PLI-ZR4Jwy4gJZLZa2S\\_DzIM2MH7ZBVVBv&index=1](https://www.youtube.com/watch?v=by9iEMnr7lg&list=PLI-ZR4Jwy4gJZLZa2S_DzIM2MH7ZBVVBv&index=1)) and weed management.

2. Small Grain Stakeholder Meeting
3. 2023 Carvel Research and Education Center Fruit and Vegetable Crops Twilight Tour
4. Fall Season Pest Identification workshop
5. IR4 EPA Field Tours discussing pathogen, weed, and insect management needs and research trails sponsored by IR-4
6. Small Grain Field Day, Wye Research and Education Center, Queenstown MD
7. UD Malt Barley Field Tour – discussing pest management and trends
8. A “Cover Cropstacle Course” event was planned and implemented for the Experience Extension Summer Camp for 10-14 year-old students. Ten students participated in our session that discussed cover crops and soil health. A feature article highlighted the grant and this 4H event. Link: [https://www.udel.edu/udaily/2023/august/4-h-cooperative-extension-focus-on-cover-crops/?utm\\_source=UDaily+Subscribers&utm\\_campaign=be922bdb65-udaily\\_daily\\_mc&utm\\_medium=email&utm\\_term=0\\_0b5034716d-be922bdb65-177511017](https://www.udel.edu/udaily/2023/august/4-h-cooperative-extension-focus-on-cover-crops/?utm_source=UDaily+Subscribers&utm_campaign=be922bdb65-udaily_daily_mc&utm_medium=email&utm_term=0_0b5034716d-be922bdb65-177511017)

## **Fact Sheets, Publications, and Educational Videos**

“Protecting Sweet Corn from Corn Earworm”

[https://www.udel.edu/content/dam/udellimages/canr/pdfs/extension/sustainable-agriculture/pest-management/Sweet\\_Corn\\_Ear\\_Insect\\_Protection\\_July\\_2023.pdf](https://www.udel.edu/content/dam/udellimages/canr/pdfs/extension/sustainable-agriculture/pest-management/Sweet_Corn_Ear_Insect_Protection_July_2023.pdf).

“Insecticide Labels and IPM Resources”

<https://www.youtube.com/watch?v=fBRKKnD8zug>.

Mid-Atlantic Commercial Vegetable Production Recommendation Guide 2024/2025. (Collaborative effort with UD, UMD, PA, NJ, WV, and VA). Available at <https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/commercial-crops/vegetable-crops/midatlantic-vegetable-recommendations/>

Mid-Atlantic Field Crop Weed Management Guide. (Collaborative effort with UD, UMD, VT, RU, PSU, and WVU; Available through Penn State Extension Publications Office and Virginia Cooperative Extension 456-016



## **Maine IPM State Report**

NEERA meeting 2024

James Dill / Glen Koehler / Griffin Dill

Professor of Entomology and IPM Coordinator / Associate Scientist IPM / IPM Professional

The UMaine Cooperative Extension IPM Program delivers pest management education, monitoring, forecasting, diagnostics, and individualized problem solving. In addition to commodity-specific outreach programs, the Pest Management Unit within the UMaine Cooperative Extension Diagnostic & Research Laboratory provides local, statewide, and regional support. The efforts of the lab and program staff help a variety of commercial and non-commercial stakeholders with effective, efficient, environmentally sensitive, and safe pest management. The Extension IPM Program collaborates with the Maine Department of Agriculture, Conservation, & Forestry (ME DACF), grower organizations, other university departments, and other New England universities in order to best serve the people of Maine and the region. The IPM programs have reached a number of underserved audiences, including Somali farmers in central Maine, Maine's Native American tribes, and Maine's Amish population.

### **TREE FRUIT**

Apples are the dominant tree fruit in Maine. The main program components in 2023 were the Maine Tree Fruit Newsletter (26 issues in 2023 covering IPM, horticulture, marketing, and other topics), the Ag-Radar apple pest/horticultural tracking/forecast system, a pest scouting cooperative subsidized by the Maine State Pomological Society, webinars and in-person meetings, and individualized telephone and field visit support. Observations from the scouting coop are shared with over 500 commercial and hobbyist growers through the newsletter. In the most recent year-end program survey, 100% of the 27 apple growers who participated in the scouting co-op said that the visits were useful to their decision making. Ninety-six percent of surveyed growers said they had benefitted from an Apple IPM Program presentation or consultation, and 100% said that the newsletter had helped them with pest management decisions. Growers estimated that support from the Apple IPM Program helped them reduce pest damage losses by 32%, while also reducing production costs by an average of \$406 per acre, with an estimated \$6.3 million benefit to Maine's apple crop quantity and quality.

### **SWEET CORN**

The sweet corn IPM program aims to address the challenges faced by farmers in managing pests while minimizing pesticide use. Sweet corn accounts for a substantial portion of fresh vegetable production in Maine, making it a crucial crop for both farmers and consumers. However, its cultivation poses difficulties due to pest pressure and the high cost associated with pesticide application. The program focuses on educating growers about IPM strategies tailored specifically to sweet corn cultivation. By employing IPM techniques, farmers can make informed decisions about pesticide application based on pest population thresholds rather than relying on calendar-based spraying. This approach not only reduces pesticide use but also helps to mitigate production costs and improve the overall quality of the crop.

Key activities of the program include training student scouts in pest identification and monitoring techniques, deploying pheromone traps in volunteer farms across the state, and providing ongoing education and support to growers through meetings, newsletters, and online

resources. Collaboration with agricultural associations and government agencies enhances the program's reach and effectiveness. The program has a number of measurable impacts on Maine's sweet corn industry. In the 2023 year-end survey, 100% of farmers reported being influenced by the IPM program's information when making pest management decisions, including the timing of sprays and choice of materials. Approximately, 67% of farmers participating in the program reduced insecticide sprays by one to ten per field, representing a reduction of 30-60%. Over 85% of participants observed increased marketable yield and higher profitability as a result of implementing IPM practices. Of the survey respondents, 53% noted that using IPM improved the perception of pest management among customers and neighbors, alleviating concerns about pesticide use. The program's reach extends to a significant portion of commercial sweet corn growers in the state, covering at least two-thirds of the acreage. By reducing insecticide applications over more than 3000 acres of sweet corn in a single season, the program has saved farmers approximately \$720,000 in pesticide costs.

Continuous evaluation and feedback mechanisms ensure that the program remains responsive to the needs of farmers and stakeholders. By adapting strategies based on survey results and leveraging data analytics to improve online resources, the program aims to further enhance its effectiveness and promote sustainable pest management practices in Maine's sweet corn production.

## **POTATOES**

The potato IPM program employed eight undergraduate students, operated 38 pheromone traps for European corn borer, monitored 38 potato fields regularly, and maintained 38 yellow pan water traps for aphid collection. Additionally, a series of tower traps in Aroostook County monitored aphid flights, with approximately 5,000 aphids examined and identified. Over the season, the program made over 4,200 individual grower contacts and disseminated weekly newsletters with pest updates to over 450 industry staff in Maine, New Brunswick, and the Eastern United States. The program trained eight individuals in integrated pest management techniques, covering various aspects such as pest identification, economic thresholds, scouting techniques, and disease models.

The program's efforts led to significant improvements in pest management practices among potato growers. The potato colonizing aphid populations remained low for most of the season, with an influx of green peach aphid observed in late August. The program alerted the potato industry to this activity, leading to increased adoption of stylet oil—a less toxic insecticide—to manage virus transmission by aphids. The adoption rate of stylet oil among seed growers increased from 18% in 2012 to 100% in 2023, resulting in reduced rejection rates of seed acreage due to Potato Virus Y. The program's monitoring and education efforts contributed to substantial cost savings and potential yield protection for potato producers. No fields exceeded threshold levels for European corn borer or Colorado potato beetles, leading to significant savings in insecticide costs. Specifically, the program estimated a \$167,680 saving in insecticides for European corn borer control and potential losses of \$2,647,837 avoided for Colorado potato beetle damage. The total economic impact from the program's insect monitoring and education activities for the season is estimated at \$2,815,517 for table stock producers. With approximately \$110,000 spent on the program, each dollar invested into the University of Maine Cooperative Extension's Potato Integrated Pest Management Program resulted in a \$25.60 saving for the monitored industry.

## **SMALL FRUIT**

With over 200 farms growing strawberries in Maine, the crop holds significant value for both farmers and local consumers. Strawberry cultivation primarily occurs on small, diversified farms, with sales through pick-your-own, farm stands, and farmers' markets. However, concerns about pesticide residue and the need to minimize pesticide use are prevalent among both farmers and consumers. The strawberry IPM program aims to increase awareness of major pests, minimize pesticide use through threshold-based spraying, reduce production costs, and improve crop quality. Activities include training student scouts in pest identification and monitoring techniques, visiting volunteer farms to monitor pest populations, and providing educational sessions and resources to growers. These resources include winter meetings, spring twilight meetings, and online fact sheets regarding strawberry pest scouting and spray thresholds.

Collaboration with agricultural associations and government agencies enhances the program's effectiveness and outreach. The program works closely with the Maine Vegetable & Small Fruit Growers Association, the Maine Department of Agriculture, Conservation and Forestry, and the USDA-NRCS to coordinate scouting sites, training opportunities, and develop incentives for farmers to adopt IPM strategies for strawberries in their farm plans.

Impact statistics from the program indicate significant success. In 2023, 92% of strawberry farmers reported being influenced by the program's information in their pest management decisions. 85% of farmers were able to reduce insecticide sprays by about 50% per field, resulting in improved crop quality and increased profitability by more than \$200 per acre. The program reaches over half of the commercial strawberry growers in the state, covering at least two-thirds of the acreage. As a result, the program saved more than two pesticide applications over more than 150 acres of strawberries in a single season, resulting in roughly \$140 per acre in pesticide cost savings.

## **PUBLIC HEALTH**

University of Maine Cooperative Extension conducts surveillance of ticks and tick-borne pathogens to track their distribution, detect trends or changes in tick activity, and to identify areas of risk for tick-borne disease in Maine. A total of 6,114 ticks were submitted to the UMaine Extension Tick Surveillance Program in 2023, with samples submitted from each of the state's 16 counties and from 407 towns. The majority of the ticks submitted were identified as blacklegged ticks (*Ixodes scapularis*), the primary vector of Lyme disease and other tick-borne pathogens, while American dog ticks (*Dermacentor variabilis*) also made up a significant portion of the submissions.

Nearly 3,000 blacklegged ticks were tested for the causative agents of Lyme disease, anaplasmosis, babesiosis, hard tick relapsing fever, and Powassan virus with an infection prevalence of 36%, 11%, 7%, 0.6%, and 1% respectively. *Borrelia burgdorferi*, the causative agent of Lyme disease, was identified in ticks from each of the state's 16 counties, while the pathogens that cause anaplasmosis and babesiosis were more prevalent in southern and coastal counties.

In addition to tick surveillance, program staff also provided outreach to the general public on the management of tick populations and personal protection from tick bites. Approximately 800 clients contacted the lab directly for guidance on handling tick-related issues. Public presentations were conducted both virtually and in-person for a variety of stakeholder groups including businesses, hospitals, gardening clubs, etc. Through these presentations, over 700 people were trained on the biology, ecology, and management of ticks and their associated pathogens.

## Maryland IPM State Report

Submitted by Kelly Hamby, MD IPM Coordinator

Maryland (MD) is a heavily urbanized, densely populated state bordering the Chesapeake Bay. Agriculture is the largest single land use in the state, with 32% of MD's total land area used for farming. The proximity between agriculture, environmentally sensitive areas, and human populations necessitates the implementation of sustainable IPM practices that reduce risks to human health and the environment. We serve a diverse population producing numerous agricultural commodities.

### Pest diagnostics

- Dr. Karen Rane retired from the pest diagnostics clinic in April 2024 and interviews will be conducted for the position in June 2024.
- Clinic diagnoses and reports on 600-800 samples per year

### Pesticide safety

- MD has nearly 9000 private and commercial pesticide applicators
- Dr. Niranjana Krishnan coordinates MD's pesticide safety programming including a monthly Maryland Pesticide News newsletter that shares proposed and upcoming changes to pesticide regulations
- One page guide for submitting public comments to EPA

### Pollinator health

- Delivering pollinator protection education programs targeting MD youth, farmers, and general public that has reached over 15,000 people
- MD exhibits higher than normal honey bee losses, with a short nectar flow and periods of nectar drought as well as a high bee colony density or 1.13 colonies per square mile
- Plan to produce high quality MD focused advanced beekeeping trainings and will cooperate with Eastern Apicultural Society' Master Beekeepers to develop

### IPM in fruit and vegetable crops

- Blueberry and blackberry cultivar trials
- Demonstration of top-performing tomato cultivars
- SCRI project focusing on corn earworm management in sweet corn
- Fruit and Vegetable News newsletter 1-2 times a month from April to November and reaches a readership of over 3,000

### IPM in green industries

- Second largest commodity with an estimated value of \$1.4 billion, 12,000 landscape businesses worth an additional \$3.7 billion
- Improving degree day predictions for crape myrtle bark scale and reduced-risk management options
- 5-day IPM scout workshops and monthly diagnostic skill building sessions
- 1-2 day biological control conferences to facilitate implementation of successful biological control programs
- 4-day advanced IPM short courses have trained over 7,000 professionals in the last 24 years
- [Greenhouse/cut flower IPM pest alert](#) newsletter published biweekly from Jan-Oct

- [Nursery/Landscape IPM pest alert](#) newsletter published weekly from Mar-Oct

#### IPM in communities

- Programming, consultations, and energy to improve implementation of Maryland's Tree Solutions Now Act that mandates 500,000 trees be installed by 2029
- 77% of the top 500 most viewed pages on UMD's Extension website were on home gardening
- Ask Extension answered 6386 questions in 2023, and 90% of 1386 survey respondents said they are very likely to recommend Ask Extension
- 85% said the information on the website was very helpful or somewhat helpful
- 64% said they would recommend the site to a friend or colleague
- 5 most viewed topics:
  - Recommended native plants
  - Vegetable planting calendar
  - Identifying household insect pests
  - How to identify poison ivy
  - Spiders in Maryland

#### IPM in agronomic crops

- 66.5% of state's total farmland (2022)
- 89% of 443 respondents indicate that the information received at winter production meetings is of benefit
- Production practices to be implemented (select all) include increased/improved: use of conservation best practices (21%), knowledge of regulations (33%), risk management (19%), pest management (41%), marketing (7%), manure and nutrient management (30%), financial management (13%), crop production efficiencies (43%) of 419 respondents
- Conducting demonstration research on producers' farms in addition to field days and winter meetings
- Multi-state slug collaboration funded by USB
- Focus on pathogens, herbicide resistant weeds, varieties, and nutrient management
- Monthly Agronomy News newsletter from Apr-Nov
  - <https://extension.umd.edu/resource/optimizing-early-season-pest-management-maryland-field-corn-0/>
  - <https://extension.umd.edu/resource/2023-maryland-tar-spot-corn-research/>
- Peer-reviewed factsheet on slugs: <https://extension.umd.edu/resource/managing-slugs-field-crops-using-ipm-principles-fs-2022-0629/>

#### Spanish language Extension

- [Extensión en Español](#) blog posts 2-4 times per month with articles that focus on science education including the value of beneficial arthropods, sustainable pest management, and more

## IPM in Massachusetts

May 28, 2024

Susan B. Scheufele

Vegetable Specialist, UMass Extension

**Vegetable & Fruit IPM:** MA is a densely populated state with very highly diversified specialty crop farms and a high proportion of specialty crops grown for sale direct-to-consumer. Agri-tourism is an important source of revenue for many MA farms. The 2023 season was incredibly challenging for fruit and vegetable producers; a deep freeze in February caused nearly 100% losses to peach crops, a hard frost on May 18 caused up to 80% losses to apple crops state-wide, flooding of the Connecticut River in July caused an estimated \$15 million in crop losses due to adulteration, and excessive rains from July through September led to poor quality and yields of vegetable and fruit crops. Because of the diverse nature of farms in MA and the high prices garnered at retail markets, there is very little enrollment in crop insurance programs, especially among vegetable producers. We conducted several online and in-person trainings on crop insurance options, and began partnering with RMA and FSA to begin a back-and-forth dialogue about improving programs for New England specialty crop producers. Luckily the state department of agriculture (MDAR) organized an emergency extreme weather crop loss reimbursement program that provided \$24 million in aid to growers in MA. Our team responded to needs of growers who have adopted **cut flower production** as an important new source of revenue and secured state specialty crop block grant funding to initiate a cut flower Extension program, run by our Pollinator Specialist, who also hosts demonstration trials on pollinator habitat and conducts educational programming on similar topics. We conducted **21 applied research trials** on topics including: climate mitigation strategies for field-grown vegetables, heat- and disease-resistant vegetable variety trials, pesticide spray drift management trials, attract-and-kill strategies for fruit insect pests, and apple rootstock evaluations. We publish 3 newsletters read by 3,250 subscribers. We hosted 50 in-person or online grower meetings for 3,201 attendees including 13 Twilight Meetings. *Our USDA-CPPM Extension Implementation Program funds about 80% of these efforts.*

- **Added six new Extension educators** to our staff including **two urban agriculture educators**
- Launched new Cut Flower Extension Program with funding from a MA Specialty Crop Block Grant
- **Research, Education, and Extension Experience for Undergraduates (REEU) Program** trains 9 undergrad interns in fruit IPM research and Extension
- Fruit trees are in decline due to winter injury and climate change
- Research on mass trapping for Japanese beetle management in grape and blueberry
- Using trap-trees for plum curculio reduced pesticide applications by 93% compared to standard full-block sprays
- Maintain 35 NEWA stations and provide ongoing maintenance and grower training
- 258 growers and ag service providers attended food safety trainings and 127 were certified through the Produce Safety Alliance Grower Training Program

- New England Vegetable Management Guide was updated and distributed in print and the online version has 68,147 unique views per year. Tree Fruit Management Guide was visited
- Work collaboratively to plan and host the New England Vegetable and Fruit Conference held biannually for ~2,000 growers and service providers
- Hosted webinar introducing growers to FSA and NRCS technical and financial assistance was attended by 75 people and has since been watched online 166 times. We provided **IPM training for NRCS planners** in 3 locations for ~35 NRCS staff
- Six factsheets on vegetable production and pest management were translated into Spanish
- We are also reaching online audiences via Instagram where our @umassvegetableteam has **over 1,100 followers** and our YouTube page, which has **over 200 subscribers**, 38 videos, and **almost 35,000 views**.

#### Extension Team Members

Susan Scheufele, Vegetable Specialist

Lisa McKeag, Food Safety Specialist

Genevieve Higgins, Vegetable Educator

Hannah Whitehead, Pollinator Specialist

Jaime Pinero, Extension Faculty, Tree Fruit Entomology

Elsa Petit, Extension Faculty, Viticulture

Jon Clements, Tree Fruit Specialist

Elizabeth Garofalo, Tree Fruit Specialist

Matthew Bley, Small Fruit Extension Educator

***Green Industries IPM:*** UMass Extension run two certificate-based training courses for landscape professionals and turf managers for 228 attendees per year. Their 4 newsletters go out to 35,110 subscribers. They hosted 23 workshops for 4,451 attendees and hosted a biennial turf field day with record attendance (~300). They conducted 2,841 1-on-1 consultations and 1,069 diagnostic consultations. Their annual garden calendar sells 8,290 copies. *The programs are industry-supported and are not funded by our USDA-CPPM Extension Implementation Program.*

- Invasive Insect Certification Program - 6 dates, 74 total unique attendees across all dates.
- Invasive Insect Webinar Series – 2,750 attendees
- Invasive Plant Management Certification Program - 4 dates, 153 unique attendees
- Disease and Weed Scouting Workshops - 3 dates, 90 unique attendees across all dates.
- Green School - 158 students
- Turf Winter School – 70 students
- Professional Insect and Mite Management Guide for Woody Plants was completed and released.



### Extension Team Members

Jason Lanier, Turf and Greenhouse Specialist  
Tawny Simisky, Woody Plant Entomologist  
Nicholas Brazee, Woody Plant Pathologist  
Angela Madeiras, Plant Pathologist  
Geoffrey Njue, Horticulture Specialist  
Randy Prostack, Weed Scientist  
Rick Harper, Extension Faculty, Urban Forestry

***Cranberry IPM:*** Many people think of Massachusetts when they think of cranberries. Cranberry farming started on Cape Cod in the mid-1800's and Massachusetts continues to grow an excellent crop of native berries. Massachusetts ranks second in the nation in cranberry production with more than 14,000 acres in production. Importantly, the cranberry industry helps to conserve open space since growers own more than 60,000 acres of uplands that are associated with their farms. The state provided \$8 million in funds to renovate the state cranberry research center in East Wareham, MA on Cape Cod. The renovation was completed in April 2023 and the new facility provides state-of-the-art lab and meeting space that supports 5 faculty, 2 USDA-ARS researchers, 6 post-docs and two Extension Educators. The team publishes a newsletter read by 214 subscribers, and updates the “Cranberry Chartbook” annually, providing up-to-date pesticide recommendations. In 2023 they made 240 consultations, hosted 5 “bogside chats” for 173 attendees in 2023. The IPM program supports research and education on pesticide efficacy and residue tolerances, WPS training, pollinator education, and risk management.

### Extension Team Members

Hilary Sandler, Weed Scientist  
Marty Sylvia, Entomologist  
Katherine Ghantous, Weed Scientist



## University of New Hampshire Cooperative Extension

### IPM Work Team

Amber Vinchesi-Vahl (amber.vinchesi@unh.edu), Jeremy Delisle, Rachel Maccini, Shyloh Favreau, Bo Liu, Tyler Edwards, Jonathan Ebba, Carl Majewski

Our IPM program focuses on providing education and technical support in the areas of Specialty Crops, Communities, Pesticide Applicators, Public Health, and Pest Diagnostic Facilities.

Proper identification of pests is the first step in IPM. Our program provides education in the importance of proper identification as well as how to identify key pests and diseases. New Hampshire residents can call or email our Ask UNH Extension home horticulture program for assistance in pest identification. We provide training to our Master Gardener volunteers on identification of common pests. Our Plant Diagnostic Lab serves both homeowners and commercial growers with disease and insect pest identification. Many of our in-person agricultural workshops include hands-on training in how to identify key pests, including our vegetable and tree fruit Twilight Meetings, Pasture Walks for livestock producers and growers of small grains & cultivated forages, and our Greenhouse Crop Production series.

Monitoring is a critical aspect of IPM that helps identify when pest management actions are necessary. We run region-wide monitoring programs for key pests affecting apple, blueberry, sweet corn, and pumpkin crops. Growers participating in these programs regularly save thousands of dollars per year in crop loss and avoid the unnecessary application of pesticides. We provide education on how to use weather monitoring tools to predict risk of crop disease and when to time IPM interventions.

Pesticide resistance is a major challenge to many of our industries, particularly our greenhouse growers of ornamental crops. Adoption of IPM-friendly pesticides and biological controls is often part of a robust resistance management plan. We collaborate with pest managers in participatory and demonstration research to encourage adoption of novel approaches.

We provide training for licensed pesticide applicators, including those pest control services that provide New Hampshire residence with protection from vectors of human diseases like ticks and mosquitoes. Community IPM includes training of school teachers, camp counselors, and other youth leaders in protection from ticks. Education in bed bug prevention and control is provided to housing managers and residents.

Our IPM program is diverse and addresses the needs of many and results in implementation of IPM practices by program participants. Participants gain skills that they can apply on the job and in their

homes. Public awareness campaigns elevate knowledge of pests of public health concern and strategies to reduce personal risk. Agricultural programs provide critical education, assistance, and data to help producers reduce costs, increase yields, and minimize environmental impacts of pest management.

#### **New personnel since March 2023 working in IPM**

- Amber Vinchesi-Vahl, Extension State Specialist: Entomology and IPM, State IPM Coordinator
- Bo Liu, Extension State Specialist, Plant Pathology and Plant Diagnostic Lab (PDL) Director
- Tyler Edwards, PDL Program Manager
- Rachel Maccini, promoted to Pesticide Safety Field Specialist

#### **Resignations**

- Anna Wallingford left UNH for a position with USDA-ARS
- Kyle Quigley, Hillsborough County Field Specialist (currently interviewing for replacement)
- Becky Sideman, Extension State Specialist, Sustainable Horticulture Production has left Extension and moved to UNH's Department Chair of Agriculture, Nutrition and Food Systems

UNH Extension's Food & Agriculture Team held 38 events, with 544 participants between 2023 and Spring 2024. Over 93% of the events were in person and included workshops, trainings, twilight meetings, grower association meetings, new farmer school, and webinars. Direct technical assistance from our state and field specialists is also extremely important and valuable to our clientele. We have 3,000 active subscribers to our NH Agriculture Update and 30 subscribers for our new text subscription service for IPM reports and pest alerts that we launched in Spring 2024.

#### **Insect ID and Plant Disease Diagnostics**

- >200 plant samples 2022-2024 (lab shut down for half of 2022 due to retirements)
- ~15 insect samples for identification from the public and farmers

#### **Tree Fruit**

- 3 Tree Fruit Twilight Meetings in 2023
- Most of our direct technical assistance was focused on climate and weather impacts in 2023 season and crop relief program
- Working with NH orchards to manage spring 2024 pests resulting from freeze and crop loss in 2023 (reduction in managing orchards for pests with no peach or apple crop last season)
- Hired IPM Scout to expand tree fruit trapping in central NH
  - Informs Fruit IPM Report and hotline
- Encourage use of Network for Environment and Weather Applications (NEWA) weather modeling for managing tree fruit pests
  - Establishing new stations, maintaining existing stations
  - Education and trainings on using NEWA at grower meetings

- Collaboration with NRCS & Xerces Society to encourage adoption of IPM practices (pollinator-friendly, NEWA stations, cultural practices, sprayer calibration)
  - Currently have 38 weather stations, goal is 50 by 2027.
  - Building working relationship between Extension and NRCS to inform and expand 595 programs

### **Vegetables and Small Fruit**

- 2 Blueberry IPM Twilight Meetings in 2023 (showcasing insect exclusion netting at 2/3 NH farms (funded by Conservation Innovation Grant))
- High Tunnel Twilight Meeting series on IPM and ID of insects and diseases in 2023
- Encourage adoption of monitoring key pests of sweet corn, cucurbit crops, and berries
  - Continue state trapping network for sweet corn pests, brown marmorated stink bug, squash vine borer, spotted wing drosophila
    - Report trap captures and relevant field observations in weekly Vegetable IPM Report (new in 2023, continuing in 2024)
- Provide education on pesticide resistance
  - Corn earworm and insecticide resistance presentation at the New Hampshire Vegetable and Berry Growers Association 2024 meeting
- Provide education on behavioral and cultural controls like perimeter or border sprays, trap cropping, mass trapping, insect exclusion netting, etc.
- Identify and provide education on invasive pests like leek moth and swede midge affecting small farms in northern New Hampshire
- Educate producers on best practices for emerging insect pests and encourage adoption of monitoring practices

### **Greenhouse and Nursery**

- 2 Greenhouse and Nursery Twilight Meetings in 2023, monthly webinar series in 2024
- Alternative pest management strategies
- Encourage adoption of biocontrol for those that have not adopted the practice/Provide education on biocontrol and emerging pest issues (ex: mealybugs)

### **Public Health**

- Work with state and non-profit organizations to provide education on ticks and tick-borne disease, conduct needs assessments, establish UNH Tick Diagnostic Lab

### **Pesticide Safety Education**

- 30-40 Pesticide Safety Education Program events with >600 attendees
- 34 recertification events with >2,700 attendees

**NEERA 2024 State Report**  
**State: New Jersey**  
**Submitted by: George Hamilton**

Current Situation: The IPM programs continue to be offered by Rutgers Cooperative Extension (RCE) in the areas of blueberries, nurseries, grapes, greenhouses, tree fruit, and vegetables. Research and extension activities conducted by faculty and staff connected to these various programs has increased the adoption of IPM and reduce our reliance on pesticides as the sole pest management tool used. During 2023/2024 work was done to develop management strategies for spotted wing drosophila in small fruits and blueberries and spotted lanternfly in wine grapes. In addition, the vegetable IPM program was able to impact additional acreage to that being scouted using their website that tracks weekly European corn borer, corn earworm and brown marmorated stink bug population changes in the state. Overall, because of these programs IPM adoption in the state was ~7,000 acres of blueberries, 500 acres in nursery stock, ten greenhouse acres, ~ 8,500 acres of peaches, ~ 2,500 acres of apples, and ~ 27,500 acres in vegetables (carrots, cole crops, high tunnel tomato production, pumpkins, peppers, snap beans, staked tomatoes, sweet corn, and sweet potatoes) for a total of more than 60,000 acres.

During the last 1.5 years two staff changes occurred in terms of retirements. For the fruit, blueberry and grapes IPM programs, Mr. Dean Polk retired during the summer of 2023. In April of 2024 Dr. Janine Spies from Florida was hired to run these programs. Dr. Spies was previously with IR-4. In October 2023, Dr. Joseph Ingerson Mahar, leader of the RCE vegetable IPM program retired. A search for his replacement is on-going. Finally, in October of 2024, Mr. Kris Holmstrom, Senior Program Leader for the same program will also retire.

EIPM Grant 2023/2024: This grant which in October of 2021 provides coordination for IPM programming in New Jersey in the areas of IPM Implementation in Specialty Crops (blueberries and wine grapes), Support for Pollinator Health (honey bees), support for the Rutgers Plant Diagnostic Center, incorporating increased IPM training for New Jersey's private and commercial pesticide applicators, and IPM programs and assistance in several New Jersey Housing Authorities. The coordination component's overall goals are to increase IPM awareness and adoption in NJ by continuing to conduct annual advisory meetings with stakeholders, represent NJ on state and regional committees, respond to IPM-related inquiries, and coordinate and report on state/institutional activities. It also has increased IPM adoption in blueberries, tree fruit and grapes, improved pollinator health, increased IPM education of pesticide applicators, supported the Rutgers Plant Diagnostic Center, and improved IPM adoption following COVID-19 in several New Jersey Housing Authorities. The goals of the Specialty Crops project are to provide fruit growers with up-to-date information, IPM demonstration projects, training about IPM practices, establishment of invasive pest management strategies and establishment of an IPM program for wine grapes. The goals of the Pollinator Health project are to establish honey bee health monitoring system and provide pollinator friendly recommendations, establish a pollinator working group, and protection plan. The goals of the Education for Pesticide Applicators project are to incorporate IPM self study training materials into the materials used to receive state applicators licenses and develop/deliver IPM presentations to NJ applicators. The goals of the Pest Diagnostic Facilities project are to provide diagnostic services to the public, state and federal agencies, commercial and agricultural stakeholders and university researchers, and participate in NJ Department of Agriculture and USDA APHIS sponsored surveys. The goals of the Training

and Implementation in Housing project are to develop and provide training to housing staff and resident leaders at 15 NJ Housing Authorities about a comprehensive IPM program to control multiple pests under current COVID restrictions.

**Management of the Spotted Wing Drosophila (SWD):** Following the spread of the spotted wing drosophila from the west coast to the east coast in 2011, this insect has become a severe pest of blueberries, grapes and other small fruit. Because of this, growers are required to use multiple insecticides sprayed multiple times during the season to manage it. Researchers (Anne Nielsen, Dean Polk and Cesar Rodriguez-Saona) in New Jersey are involved in an USDA SCRI funded project to develop IPM based management strategies for this pest.

**Management of the Spotted Lanternfly (SLF):** With the movement of this insect into New Jersey in 2018, Anne Nielsen and George Hamilton have begun tracking its spread throughout the state, developing management tactics for wine grape growers, and examining SLF's development on different hosts at different temperatures. Each are members of the SLF Working group, received funding via a USDA SCRI grant obtained by Penn State University and USDA APHIS funds to support SLF research and extension activities.

**Multistate collaborations:** The New Jersey program maintains collaborations with extension and research personnel in Maryland, Michigan, Pennsylvania and Virginia on a variety of projects including the management of spotted lantern fly and spotted wing drosophila.

**IPM Impacts:** 1) Overall, growers are better able to monitor for SLF and SWD allowing them to make better pest management decisions, 2) Conventional growers are using less insecticides to manage pests in fruit and vegetable crops; 3) Increased number of grape growers are enrolled in the grape IPM program when compared to previous years, 4) blueberry growers and bee keepers have a better understanding of the pesticides found in bee hives used to pollinate NJ blueberries, 5) residents and employees in urban housing authorities have a better understanding of IPM in these facilities, and 6) Commercial applicators, farmers and the public are making better management decisions based on proper pest identifications due to the activities of the Rutgers Plant Diagnostic Center.

**Cornell University**  
**New York State Integrated Pest Management Program**

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Prepared by Alejandro A. Calixto, Director - NYSIPM Program

**SITUATION**

New Yorkers are exposed to risks from pests and the methods used to control them.

**RESPONSE**

The NYSIPM Program reduces environmental, health, and economic risk by teaching, demonstrating, and researching IPM practices. We conduct programs in crops—fruits, vegetables, ornamentals, field crops, and livestock; and community settings—schools, homes, municipalities, parks, and golf courses.

**MAJOR ACOMPLISHMENTS**

**Funding: \$5,596,744 total**

In 2023 New York State provided the New York State IPM Program \$2,000,000 for Agricultural IPM, \$1,000,000 for Community IPM, \$250,000 for DEC – PSEP and \$853,172 for PSUR-PSEP. We were further supported by \$254,998 in USDA-NIFA-CPPM Extension Implementation Program (EIP) Area (grant no. 2017-70006-27142), and \$1,238,574 in program-wide leverage funding secured by IPM staff.

**Towards Safer and Sustainable Alternatives to Neonicotinoid Insecticides – Specials Projects and an Action Plan:** NYSIPM, in collaboration with other CALS faculty and NYS Agriculture and Markets, continues evaluating alternatives for neonicotinoid insecticides, which have been shown to harm pollinators and other beneficial insects. We have expanded to thirteen projects, with majority initiated in April 2022, some focusing on alternatives for insecticide seed treatments for managing seedcorn maggot in corn and soybean. Projects include the development of a pest and pesticide risk assessment tool.

**NEWA 3.0 – Network for Environment and Weather Applications (NEWA):** NEWA launched a new, user-focused website with improved accessibility, offering over 40 models for insect, plant disease, crop management, degree days, and weather summaries across 28 US states. This real-time Decision Support System integrates data from 785 public and private weather stations. Two new models for Spotted Lanternfly and Seedcorn Maggot are currently being validated.

**Invasive Species**

***Spotted lanternfly (SLF)***

The hallmark of the work on SLF was a first-of-its-kind, April 2023 Spotted Lanternfly Workshop, which

brought over 80 nationally recognized researchers and regulatory officials from across the United States and Canada to Cornell University to facilitate collaboration, determine research priorities and broaden advocacy efforts related to SLF. Outreach and education efforts continued reaching out to over 8,000 people and with program offered to farmer and Spanish-speaking farm employees.

#### ***Box tree moth (BTM)***

In collaboration with the NYSDAM, NYSIPM developed dedicated programs and webpages to raise awareness and improve early detection. These programs feature detailed information of the moth, monitoring and reporting techniques, control strategies, and alternatives to boxwoods for nursery producers, retailers, and landscape managers. Linked by state agencies and the Horticulture Research Institute, the BTM site received over 2200 views in its first weeks, boosted by a social media campaign informing New Yorkers about the BTM threat.

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#### **Hybrid IPM Presentations**

***2023 Annual NYSIPM Conference (hybrid): “Sustainable Landscapes and Integrated Pest Management”***. This event marked the 10th conference focused on bringing together a wide range of

speakers to address and discuss sustainable landscape practices. Attended by over 100 participants, including homeowners, landscape industry, educators, scientists and state stakeholders.

***What’s Bugging You First Friday Events*** – Launched in March 2021, this program invites experts from

different parts of the US each month to share practical information and answer questions on using IPM to

avoid pest problems and promote a healthy environment where you live, work, learn, and play.

Each

presentation ends with an IPM Minute, covering specific actions participants can take in the next few

days to help avoid pest problems. This well-established and successfully branded program is well attended,

with over 2200 people registered and an average of 70 attending each event. Four events were offered in Spanish.

***NYSIPM Academic Seminars*** – Launched in February 2021 – This monthly seminar series was designed to increase awareness of new research and techniques that advance IPM and its adoption in all pest management settings. We offered eight seminars with over 300 participants.

***2023-2023 Annual Report***, now electronic, our Annual Reports are excellent tools for communicating NYSIPM to stakeholders. In our most recent report, we featured efforts about virtual presentations “What’s Bugging You First Fridays”, Rodent Management in municipalities,



Asian Longhorn Tick early detection and extension, Urban Agriculture IPM, retirements, and new hires. This report shows NYSIPM's positive impact on New Yorkers and their environment and is an excellent outreach tool for our program.

#### **Resources produced**

- [NYSIPM YouTube channel](#) – 326 videos with a total of 2,180 subscribers
- [The NYSIPM Image Gallery](#) provides visual identification information and links to IPM educational materials with over 4,989 images and videos.
- 14 podcasts on Weed IPM ("[Into the Weeds](#)") available in [Spotify](#) and [Google Podcasts](#)
- [Dung beetles visual guide](#) – provides identification and biology for 18 dung beetle species.
- [Spotted lanternfly expansion map](#)
- [Spotted wing drosophila distribution map](#)
- Blogs
- [ABCs of School and Child Care Pest Management](#)
- [Weekly Field Crop Pest Report](#)
- [Spotted Wing Drosophila](#)
- [Biocontrol Bytes](#)
- [Sweet Corn Pheromone Trap Network](#)
- [Ornamental Crops IPM](#)
- [ThinkIPM](#)
- [Your NEWA](#)
- Twitter feeds

[@NYSIPM](#), [@NYSFieldCropsIPM](#), [@OrnamentalIPM](#), [@Iknwplnts](#), [@IPM\\_School&Childcare](#),  
[@AmaraDunn](#), [@Tinigua](#)

## Pennsylvania Integrated Pest Management (PAIPM) Program Report to NEERA 2024

John Tooker, IPM Coordinator, Professor of Entomology, [tooker@psu.edu](mailto:tooker@psu.edu)

PAIPM is a diverse program that spans agricultural and urban systems. The former director, Ed Rajotte, retired at the end of April 2023; therefore, calendar year 2023 was the first year under direction of John Tooker, Professor of Entomology at Penn State, as the State IPM Coordinator and Director of the PA IPM program. Listed below are some activities of the programs supported during 2023 by the USDA EIP in Pennsylvania with project leaders listed. These activities do not include all the IPM working happening at Penn State or Pennsylvania because some key contributors were unable to send their details to be included here.

***Insect Diagnostic Services, Dept. of Entomology, Michael Skvarla.*** Dr. Skvarla performed 1212 identification requests in 2023, a 4.3% increase from 2022. This is 9.6% lower than the average of 1342 requests per year for 2018-2022 (excluding 2020 because of the murder hornet scare). Most (77.8%) ID requests were processed and clients contacted within two days, while some (6.1%) took longer than five days.

Skvarla, M. J., J. Tooker, and A. Murillo-Williams. 2023. New information about lizard beetles (Coleoptera: Erotylidae: Langurini: *Languria angustata* (Beauvois, 1805) and *Languria mozardi* Latrielle, 1807) in Pennsylvania. *Coleopterists Bulletin*, 77(1): 28–31.

***Community IPM in Philadelphia, Dion Lerman.*** Urban IPM Technician Training in North Philadelphia: Working with ECA (Energy Coordinating Agency), a local NGO that provides training in building trades, the PAIPM Program received a US EPA Environmental Justice grant for an innovative program to train residents on North Philadelphia as Urban IPM Technicians. A second cohort of 16 students took the training in March 2023, and several students passed their exams, but we are seeking clarity from ECA on the exact number. Some of those who did not pass appear have expressed a willingness to retake their exams.

Medicare Reimbursement for IPM-based Pest Control for Disabled Adults: By January 2024, the program contractors performed 866 service calls. Bed bugs were the most common pest treated, accounting for over 43% of treatments. Cockroaches (39%) were the next most common pest treated, with mice (33%) rounding out the top complaints. Only 23% of treatments involved more than one pest; cockroaches and mice were the most common combination (10% of treatments), followed by bed bugs and cockroaches (6%). “Other” pests (i.e., rats, squirrels, fleas, and raccoons) were encountered rarely. Notably, contractors resolved 91% of complaints with a single visit. Encouragingly, our program has had more success eradicating pests in single visits than conventional (e.g., National) pest control companies, and about 20% less expensive. Customer satisfaction with the program is 100%.

*No publications*

***IPM in Agronomic Crops, John Tooker, Professor of Entomology.*** Tooker’s group led two efforts to track pest populations with the expectation that information on local pest populations can encourage folks to adopt IPM. First, we used pheromone traps to detect migrating populations of black cutworm, which is a significant pest of corn. We detected only two “significant flights” of black cutworm moths and communicated these results with the agricultural community. Second,

we collaborated with county-based extension educators on a project funded by the Pennsylvania Soybean Board to scout “typical” soybean fields. The goal of the project was to encourage growers to adopt Integrated Pest Management by providing growers with local assessment of insects and diseases active in soybean fields across the state. Including 2023, over 12 years only three fields out of 235 field (1.3%) have needed insecticides and no fields have needed fungicides. In 2023, Tooker presented 13 talks at meetings reaching 629 farmers and other agricultural professionals in nine counties in Pennsylvania. Tooker also authored 21 weekly newsletter articles, each of which was distributed to >12,000 digital subscribers to Penn State’s Field Crop News.

Kunkel, B., W. J. Cissel, J. F. Tooker, D. K. Howe, D. R. Denver, R. Mc Donnell, and I. Hiltbold. 2023. Nematodes associated with terrestrial slugs in mid-Atlantic (Delaware, USA) soybean. *Agronomy* 13: 645

Lefever, A., J. Wallace, P. Esker, C. White, S. Duiker, and J. F. Tooker. Vertical tillage effects on crop production and pest management in Pennsylvania. 2023. *Agronomy J.* 116: 520-530.

### **IPM in Grape production, Flor Acevedo, Assistant Professor of Entomology**

In 2023, Dr. Acevedo performed the following IPM-related activities:

- Identified five larval parasitoids of grape berry moth (*Paralobesia viteana*) in northwest Pennsylvania: *Bracon variabilis*, *Campoplex tortricidae*, *Enytus* sp., *Glypta* sp. *Goniozus fratellus*. In 2024, they will develop protocols to rear these species in laboratory conditions.
- Conducted research to estimate economic thresholds for management of spotted lanternfly in *Vitis vinifera*. Preliminarily, infestations with spotted lanternfly adults reduced total soluble sugars, total phenolics, and tannins in grape juice. Additionally, two consecutive seasons of infestations by adult SLF reduced yield.
- Dr. Acevedo delivered nine extension talks to grape growers (n = 160), extension educators (n = 206), and the general public (n =710) about spotted lanternfly research, identification and basic biology, and management in grape. Her interactions with growers and other agricultural professional enhanced knowledge of ~ 1,076 people on spotted lanternfly identification, basic biology and management in grape.

Laveaga, E., Hoover, K. and Acevedo, F.E., 2023. Life history traits of spotted lanternfly (Hemiptera: Fulgoridae) when feeding on grapevines and tree of heaven. *Frontiers in Insect Science*, 3, p.1091332.

**IPM of Mushroom Production, Michael Wolfin, Assistant Research Professor.** To help address challenges of insect pests in mushroom production, during 2023 Dr. Wolfin and his graduate students Malachi Brought and Luke Reynolds amassed 719 stakeholder contacts at 176 contact activities. Activities included farm visits and trainings, phone calls with growers, phone calls with residents regarding fly home invasions, a public presentation co-hosted by State Representative Christina Sappey's office, and the Pennsylvania Department of Agriculture (323 views), Phorid Fly Action Council meetings, and American Mushroom Institute IPM committee and general meetings. They also presented their IPM research at the 2023 Spring Pesticide Credit Meeting, and the 2023 Fall Pesticide Credit Meeting. Dr. Wolfin also collaborated with mushroom growers to participate in field trials to test different approaches that can help manage insect pests of mushrooms: 1. entomopathogenic nematodes; 2. updated traps to monitor flies on farms; 3. pilot studies to test a mass trap to control fly populations on farms; and 4. pilot studies to test predatory mite

applications to control mushroom flies. Lastly, Dr. Wolfin maintained the Mushroom Fly Hotline where he interacted directly with stakeholders to answer questions and concerns and track mushroom fly infestations and invasions.

*No publications*

**Rhode Island IPM Extension Implementation Program**  
**2024 Annual NEERA Report**  
**Lisa Tewksbury, PhD, URI EIP Coordinator**

**2023 IPM Team:** Lisa Tewksbury, Heather Faubert, Keiddy Urrea-Morawicki and Lexi Johnson  
Heather Faubert retired from the University of Rhode Island in February 2024.

**Accomplishments:**

As part of our priority for landscape IPM programming, we identify and assess pest problems such as beech leaf disease, spotted lanternfly and emerald ash borer. Heather Faubert has been working with the US Forest Service to monitor beech leaf disease at 6 long term monitoring sites in American beech in RI. She also provided many public presentations on BLD and wrote a BLD Update fact sheet: <https://web.uri/ipm/2023/04/beech-leaf-disease-in-ri-2023-update/>. This update was initially emailed to 80 addresses and has been seen by thousands since being posted. Heather Faubert was also participated in research efforts using Phosphite products to manage BLD.

One major activity in the landscape program area is to present educational programming to landscape managers, including homeowners and professionals. These programs, planned with stakeholders, are offered by URI IPM staff and supplemented by faculty from URI and other institutions as needed. Heather Faubert and Lisa Tewksbury provided updates at the RI nursery and Landscape Association meetings on new invasive pests and update recommendations for managing these and other pests. The annual winter meeting is attended by over 300 nursery producers and landscapers.

Lisa Tewksbury has been a participant in the SLF Working group and the Stakeholder partnership group, both organized by Penn state. We are contributing to SLF biocontrol, as well as contributing to the state's efforts at surveying for SLF and providing SLF outreach materials, including a strong presence on social media.

Heather Faubert conducted many farm visits, contributed to newsletters and conducted meeting for vegetable, fruit and nursery growers. She also assisted with writing a Specialty Crop Block Grant for the RI Fruit Growers Association (RIFGA) to purchase four weather stations to connect to Cornell University's NEWA system. Education efforts have centered on teaching fruit growers and other specialty crop growers how to use NEWA to use weather information to assist them with their pest management decisions.

Two fruit and two vegetable twilight meetings were held in 2023. The newsletter RIAgNotes was used to keep growers informed of all IPM workshops, webinars and other opportunities available.

**Outputs:**

- 31 Educational events (3,607 participants)
- 333 Commercial grower and public samples diagnosed
- Social Media – Instagram: 68 posts and many stories (currently 995 followers)

**Impacts:**

Winter moth populations have increased in blueberries in recent years, and blueberry growers have benefited from Heather Faubert's newsletter identifying when egg masses are hatching to allow better timing of pesticide treatments.

The Allium leafminer was first found in RI in 2022 and regular scouting continued into 2023. By April of 2023 it was found in all 5 RI counties. A Pest Alert was sent to growers and adult monitoring was set up in one RI farm. RI vegetable growers were educated about this new pest to allow them to manage it effectively.

The URI Diagnostic Clinic has begun the process of becoming accredited by the National Plant Diagnostic Networks, which helps the clinic initiate a system of standard operating procedures that ensures accurate and rapid diagnoses. The updated lab aims to increase the diagnostic capabilities by incorporating more morphological (culturing) and molecular identification capabilities for new and emerging diseases in Rhode Island and the region.

The RI Fruit Growers association wrote a Specialty Block Grant, with Heather Faubert's assistance, to purchase four weather stations to connect to Cornell University's NEWA weather system. The annual meeting was used to educate growers about using this system, which has had a positive impact on their ability to utilize weather data to make pesticide treatment decisions.

**Publications:**

Beech Leaf Disease in RI <https://web.uri.edu/ipm/2022/05/beechn-leaf-disease-in-ri/>

Winter moth update <https://web.uri.edu/ipm/2023/04/winter-moth-update-april-13-2023/>

Exploring Novel management Methods for Beech Leaf Disease, An Emerging Threat to Forests and Landscapes. <https://meridian.allenpress.com/jeh/article/42/1/1/499411/>

Common reed biocontrol agents: History and Ecology in North America  
<https://bugwoodcloud.org/resource/files/27703.pdf>

Swallow-worts: History and Ecology in North America  
<https://bugwoodcloud.org/resource/files/27697.pdf>

**Vermont IPM Extension Implementation Program  
2023-2024 Annual NEERA Report  
Ann Hazelrigg, PhD, UVM EIP Coordinator**

**Accomplishments**

The Vermont Integrated Pest Management (IPM) Program addresses essential IPM needs as identified by stakeholders in the state as well as advances the goals of the National IPM Roadmap to build sustainable pest management systems that reduce the potential risks to human health and the environment. Agronomy, Tree Fruit, Grape, Greenhouse, High Tunnel, Nursery, Community (Master Gardener), Plant Diagnostic, and Pesticide Education program areas are closely integrated with a research base and are well matched with expertise at the University of Vermont. Each program area involves collaborative efforts both within the state and region to optimize resources and expertise to develop effective IPM programs. Education and information delivery methods are diverse and include meetings, webinars, online courses, presentations, newsletters, factsheets, articles, blogs, and one-to-one education. The Master Gardener Helpline and the Plant Diagnostic Clinic provide IPM information to commercial and home gardeners.

**Outputs:**

- 112 educational events (5451 participants)
- 85 publications (newsletters, factsheets, newsletter articles, journal articles, blog posts)
- 23 research farm sites
- 198 one-on-one consultations with growers
- 820 home gardening questions answered
- 526 commercial samples diagnosed

**Impacts**

- Agronomy Field Days & Conferences participants increased knowledge of prevalent pests and IPM practices to minimize crop impact, including managing seedborne diseases. Hop and hemp farms implemented IPM strategies including pest scouting and timely pesticide applications. Small grain, corn, and bean seed quality testing encouraged farmers to purchase certified seed, improve crop rotation, buy tolerant/resistant varieties, manage harvest to segregate lots of seed, and improve cleaning. Agronomy pollinator education increased knowledge and intention to implement strategies to enhance and protect pollinators.
- Orchard scouting and consultation visits provided mentoring opportunities for a new generation of IPM scientists. Grape “natural” production surveys and research results are shared with local and international audiences. Up to 63% of orchards changed management practices to improve identification and management. "We learn more about IPM every year and continually evolve our practices."
- 75% of Greenhouse/High Tunnel/Nursery Tri-State IPM participants “have adopted all the recommended IPM practices over the past several years.” IPM First one-on-one greenhouse and high tunnel grower consultations increased the use of biological control agents and plant mediated IPM systems. 61% of new high tunnel growers used biological control agents for the first time: “Our tunnel looks the cleanest and healthiest it has ever looked at this point in the season and our pest issues have been very manageable.” High tunnel conference and tour
- knowledge of IPM they intend to use.

- Master Gardener Course students gained knowledge about Integrated Pest Management practices. 86% made changes to the way they garden at home or in their work with clients as a result of what they learned during the course. 51% of Master Gardener Helpline clients implemented the IPM strategies recommended and 61% avoided the use of pesticides, saving \$104 per client on pesticide costs. Extension Master Gardener volunteers maintain pollinator demonstration gardens that reach the public with direct education.
- 93% of Plant Diagnostic Clinic clients implemented recommended IPM strategies and 86% reduced their use of pesticides, saving \$400 per client on pesticide costs. “With accurate information we can make smart choices, often avoiding pesticides all together.”
- Annual pesticide certification meeting, webinar, and online course participants are likely to use pesticides more safely and adopt IPM practices, including understanding pesticide compatibility, rodenticide use standards, and avoiding herbicide resistance. “This is hard material to digest and verbal discussions help in retaining the information.” *The Pesticide Applicator* newsletter “helps me better protect myself as an applicator of pesticides, better protect the public, and the environment.” Up to 89% of pesticide applicators are likely to adopt at least one new IPM practice to protect pollinators including pesticide best practices and reducing drift following trainings.

### Publications

- 3 journal articles Pelletier, B. and Bradshaw, T.L. (2024). Biorational pesticide efficacy in northern New England vineyards. *Acta Hort.* 1387, 269-276. DOI: 10.17660/ActaHortic.2024.1387.37. <https://doi.org/10.17660/ActaHortic.2024.1387.37>
- Pelletier, B. and Bradshaw, T.L. (2024). Experience and understanding of concepts surrounding ‘natural wine’ in Vermont. *Acta Hort.* 1387, 39-48. DOI: 10.17660/ActaHortic.2024.1387.6. <https://doi.org/10.17660/ActaHortic.2024.1387.6>
- Sullivan, C.F., Davari, A., Kim, J.S., Parker, B.L. & Skinner, M. 2023. Evaluation of a guardian plant system to suppress *Frankliniella occidentalis* (Thysanoptera: Thripidae) in greenhouse ornamentals. *Pest Management Science*. <https://onlinelibrary.wiley.com/doi/full/10.1002/ps.7556>

### 6 factsheets:

- Create an Unfriendly Yard for Ticks & Their Hosts with Landscaping <https://www.uvm.edu/~uvmticks/Landscaping%20to%20Reduce%20Ticks%20Factsheet.pdf>
- Using pest fighting plants in high tunnels <https://www.uvm.edu/~htunnel/factsheets/PestFightingPlantsHighTunnelsCherylSullivan.pdf>
- Managing Stinging Wasps, Bees and Hornets <https://www.uvm.edu/sites/default/files/Extension-Community-Horticulture/Resources/waspsandhornetmanagement2023.pdf>
- White Grubs (Family Scarabaeidae): A Serious Lawn Pest <https://www.uvm.edu/~entlab/Landscape%20IPM/WhitegrubsinsoilJune2023.pdf>
- High Tunnel Winter Greens Diseases <https://www.uvm.edu/~htunnel/factsheets/WinterGreensDiseasesHighTunnelsAnnHazelrigg.pdf>



- High Tunnel Tomato Diseases <https://www.uvm.edu/~htunnel/factsheets/HighTunnelTomatoDiseasesAnnHazelriggSARE.pdf>

Vermont Pesticide Certification Guide (update) [https://www.uvm.edu/sites/default/files/UVM-Extension-Cultivating-Healthy-Communities/PSEP/PSEP\\_FactSheet\\_VTPestCertGuide.pdf](https://www.uvm.edu/sites/default/files/UVM-Extension-Cultivating-Healthy-Communities/PSEP/PSEP_FactSheet_VTPestCertGuide.pdf)

#### 11 newsletter articles:

Avoiding Aphid Fallout. High & Dry: Growing Vegetables in Northern New England High Tunnels Newsletter. Issue 1: Fall. <https://www.uvm.edu/~htunnel/newsletters/Fall%202023%20Issue%201%20High%20Tunnel%20Newsletter.pdf>

Now is the time to prepare a Biocontrol plan for aphids in your high tunnel vegetables. High & Dry: Growing Vegetables in Northern New England High Tunnels Newsletter. Issue 2, Spring. <https://www.uvm.edu/~htunnel/newsletters/Issue%20%20High%20Tunnel%20Newsletter%20Mar%202024.pdf>

Using Pest Fighting Plants in High Tunnels: Awesome Alyssum. High & Dry: Growing Vegetables in Northern New England High Tunnels Newsletter. Issue 2. <https://www.uvm.edu/~htunnel/newsletters/Issue%20%20High%20Tunnel%20Newsletter%20Mar%202024.pdf>

Native Solitary Bees and How You can Support them. The Dirt, VT Nursery & Landscape Assoc. Fall Issue: 29-31. 350 subscribers. <https://vnlavt.org/2023/10/11/2023-fall-issue-of-the-dirt/>

Observations from the UVM Plant Diagnostic Lab. The Dirt, VT Nursery & Landscape Assoc. 4 issues. 350 subscribers. <https://greenworksvermont.org/news-events/the-dirt/>

Biotic vs. abiotic: Diagnosing plant damage. Vegetable Grower News. 10/25/23 <https://vegetablegrowersnews.com/article/biotic-vs-abiotic-diagnosing-plant-damage/>

Back to Basics CORE Essentials: Pesticide Review. Fall 2023 [https://www.uvm.edu/sites/default/files/UVM-Extension-Cultivating-Healthy-Communities/PSEP/PAR\\_2023Fall.pdf](https://www.uvm.edu/sites/default/files/UVM-Extension-Cultivating-Healthy-Communities/PSEP/PAR_2023Fall.pdf)

Back to Basics CORE Essentials: Reading Labels to Compare Products. Spring 2024 [https://www.uvm.edu/sites/default/files/UVM-Extension-Cultivating-Healthy-Communities/PSEP/TPA\\_2024Spring.pdf](https://www.uvm.edu/sites/default/files/UVM-Extension-Cultivating-Healthy-Communities/PSEP/TPA_2024Spring.pdf)

- 60 blog posts  
57 UVM Fruit blog posts: <http://go.uvm.edu/ogreu>

3 Agronomy blog posts: <http://blog.uvm.edu/outcroprn>

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## IPM State Report - West Virginia

The IPM team members in West Virginia have been carrying out Extension IPM programs in primarily in the areas of Specialty Crops (Tree Fruit, Vegetables, and Urban Horticulture (Master Gardeners)).

**Staff changes.** We are still in the process of identifying person to fill this position for the IPM Associate position which has affected our programming capabilities. A person we hired worked for three months last year but left for a different job.

Significant outputs of 2023-'24:

1. Continuation of EQIP cost-share program for two commercial orchards in Eastern Panhandle District.
2. Continued publication of quarterly IPM Chronicle newsletter.
3. Continued programming in Greenhouse and High Tunnel IPM.
4. Display materials (Poster, yard-signs, brochures) developed for participants of Tree Fruit IPM Plan (to be displayed in the Farm Markets).

### Success Stories

Insect Pest Management:

Approximately 100 acres of apples was under the Tree Fruit IPM plan during the past growing season. IPM practices implemented by the growers included application of pesticides based on threshold levels, use of semio-chemicals and reduced-risk pesticides, partial application in orchards, along with application under proper environmental conditions. We monitored codling moths, Oriental fruit moths, tufted apple bud moths, and redbanded leafrollers throughout the growing season at USDA-ARS Appalachian Fruit Research Station, Orr farm, and Kitchen Farm. We recommended insecticide applications when captures in pheromone traps exceed the threshold of 5 codling moths/trap/week.

We created biofix dates and weekly trap captures for the mentioned pest. Results were sent through email in our bi-weekly newsletter, Orchard Updates. We sent twelve updates to seventeen subscribed growers during the grower season. On average, our Orchard Updates emails had 56 percent open rate. Our information could improve the efficacy of insecticides, which reduce unmarketable fruits and increase production.

We also monitored insects that migrate each year from the south that have the potential to damage vegetable, field crops and vegetative cover on pipelines. Our program determines insect population dynamics to improve pest control on other WV agricultural crops. For example, black cutworm cannot overwinter in the state. Instead, it migrates from the south in spring. We use pheromone traps to determine the first migratory flight, which serves as the "biofix" or designated starting point. From the biofix or intensive capture, an average of 300 degree-days (based on 50°F) is required for the black cutworm to develop from the egg to fourth instar larval stage. Black cutworm larvae can cut corn from the fourth-instar stage until pupation; consequently, the injurious cutting stage may last 2½ to 3 weeks, depending on temperature. Corn is vulnerable to cutting from emergence through the five-leaf growth stage.

We monitored Japanese beetles, spotted lantern fly, and fall armyworm. Information was shared on WVU social media platforms. Although our target audience is vegetable growers, we have received positive feedback from pipeline cover and forage managers. We recommended the use of reduced-risk insecticides such as Bt and spinosad to reduce the impact on our soil and water resources.

#### Disease Management:

We also conducted a demonstration on managing 'bitter pit' disease on 'Honeycrisp' apple at Kearneysville tree fruit research and education center with different combinations of calcium and manganese that produced good results. Growers may adopt this technology to reduce incidence and severity of bitter pit in 'Honeycrisp' apple. This demonstration was repeated in 2023 as on-farm trials. Cucurbit downy mildew forecast, and disease risk was sent to county agents' listserv as 'AgAlerts' to share with vegetable growers so that they could take measures on time. We engaged master gardeners from 3 counties to report suspected incidence of downy mildew on cucurbit crop, which helped use immensely in generating the forecast. In addition, late blight of tomato and potato was tracked from <https://usablight.org/map/> to determine the need for preventative measures in the state. We continued distributing seed packets of blight tolerant tomato varieties for 2023 growing season. Demonstration of tomato soil-borne disease management of strawberry using biofumigation, biological control agent and anaerobic soil disinfestation is being continued at the WVU organic farm.

#### Weed Management:

In weed management research, we have identified a new herbicide mixture that could selectively control broadleaf weeds in cool-season grass pastures and hayfields without affecting white clover. Research is ongoing to evaluate its effectiveness.

The IPM trifold brochures containing graphics and condensed information were passed on to the end-user at Farm Markets and during Extension events. During the past three years, the IPM Team participated the Small Farm Conference and State Fair. IPM booths with brochures were set up at these events. We compiled electronic mailing lists for greenhouse and high tunnel producers, tree fruit growers, vegetable producers, small farm producers, and Master Gardeners to provide timely information related to IPM.

Evaluations of various programming efforts indicated that the ability/understanding of participants improved in all areas including: IPM practices, identification of pests, scouting/monitoring, non-chemical pest management measures, selection of chemical sprays, pollinator safety, understanding of pesticide labels, matching signal-words with toxicity ratings, safe pesticide storage, handling and disposal of pesticide spills, balancing plant nutrition, and identifying mineral deficiencies.

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