Meeting the IPM needs of Vermont Stakeholders

Program areas address critical IPM needs by:

- Closely integrating with **research** led by specialists at the University of Vermont
- Utilizing effective **outreach** to deliver programs in a wide range of crops and settings
- Involving strong **collaborative** relationships with state and regional stakeholders, commodity groups, and agencies

Agriculture is Essential to Vermont

Vermont's farms have been diversifying to include many specialty crops and welcoming many beginning farmers eager for information to successfully incorporate IPM tools into their operations. The Vermont IPM program provides essential information for diverse crops and audiences to reduce pesticide use, reduce pest and disease losses, decrease production costs, and reduce human and environmental risks.

Communities, Pest Diagnostics, Pesticide Education

PI: Ann.Hazelrigg@uvm.edu, Plant Diagnostic Clinic Director
http://www.uvm.edu/mastergardener
https://www.uvm.edu/extension/psep
https://www.uvm.edu/extension/pdc

Agronomy

Heather.Darby@uvm.edu, Extension Agronomist
http://www.uvm.edu/extension/cropsoil

Tree Fruit & Grape

Terence.Bradshaw@uvm.edu,
Tree Fruit and Viticulture Specialist
http://www.uvm.edu/extension/commercial-horticulture

Greenhouse, High Tunnel & Nursery

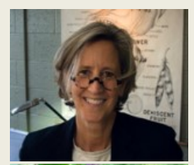
Margaret.Skinner@uvm.edu, Extension Entomologist
http://www.uvm.edu/~entlab/ipm.html

Contact Us

Visit us on the web at **https://www.uvm.edu/extension/ipm**

Program Coordinator
Ann Hazelrigg
Ann.Hazelrigg@uvm.edu
(802) 656-0493

Program Support & Evaluation Specialist
Sarah Kingsley-Richards
Sarah.Kingsley@uvm.edu
(802) 656-0475



Integrated Pest Management

The Vermont IPM Extension Implementation Program Addressing Stakeholder Priorities and Needs for 2021-2024

The Vermont Integrated Pest Management (IPM) Program addresses critical needs identified by stakeholders to encourage adoption of effective, affordable and environmentally-sound IPM practices while maintaining agricultural productivity and healthy communities. **This three year grant partially funded salaries of 4 faculty, 8 technical and administrative staff, and 3 student personnel.**

- **295 educational events**
- **16,996 participants**
- **4,431 pest questions**
- **233 outreach publications**

"Use of sustainable IPM practices reduces health and environmental risks, while allowing us to offer a crop that is profitable and engages the community with premium fruit."

- Vermont Apple Grower

Scouting greenhouse ornamentals

Program Areas

- Agronomy
- Tree Fruit & Grape
- Greenhouse, High Tunnel & Nursery
- Communities
- Pest Diagnostics
- Pesticide Education

USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

This work is supported by Crop Protection and Pest Management Program [grant no. 2021-70006-35509/ acc. no. 1027204] from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Grain demonstration plots

Agronomy

- Attendees of **Agronomy Field Days and Winter Conferences** learned to identify pests, purchase certified seed and resistant varieties, adjust fertility, and modify mechanical cultivation to minimize crop impact by pests.
- Participants in the **Hop and Hemp Disease Survey** learned to scout for pests, identify pests, and adopt IPM strategies. Scouting identified a new hemp flea beetle pest causing severe damage to cones.
- Participants in the **Seed Quality Testing** learned to identify diseases, purchase certified seed and resistant varieties, improve crop rotation and cleaning, and segregate seed lots to improve production and reduce risk to human health.
- **Pollinator Education Pest Assessment Plan** and event participants learned scouting, to minimize movement of insecticide dust, and use seed not treated with neonicotinoids to enhance and protect pollinators in agronomy crops.

One **Hop Disease Survey** farm adopted a new IPM program to effectively manage *Alternaria* cone disease while reducing pesticide applications by 50%

Orchard pollinator showcase

Tree Fruit & Grape

- Attendees of **Apple & Grape Extension, Outreach and Education** events adopted IPM practices including comprehensive pest monitoring to improve pest identification, timing, and decrease pesticide use. Changing these behaviors increased confidence in making pest management decisions.
- Participants in the **Orchard Scouting Network** received in-depth consultations on production issues. Scouting results reported in program newsletters provided IPM guidance to growers throughout the state.
- The **Grape 'Natural" Production Evaluation** included mineral fungicides, biofungicides, biodynamic preparations, and other pest management alternatives. Results shared with growers and published in journal articles improved understanding of emerging pest management systems throughout the region.

"Participation in the UVM Fruit Program has allowed us to be much more targeted and thus much more effective with our limited sprays."

- Vermont Fruit Grower

Greenhouse IPM

Greenhouse, High Tunnel & Nursery

- Attendees of **Tri-State IPM Workshops** adopted IPM practices including scouting and identification of pests, biocontrol agents, and abiotic symptoms; use of biocontrol, biopesticides, reduced-risk pesticides, and plant-mediated IPM systems; soil and media testing; sanitation; and diagnostic services. Changing these behaviors decreased conventional synthetic pesticide use.
- Participants in the **IPM First** program adopted IPM practices including scouting and identification of pests and biocontrol agents; use of biocontrol, biopesticides, reduced-risk pesticides, and plant-mediated IPM systems; and diagnostic services. Many high tunnel growers utilized biocontrol agents for the first time through the program.
- **Pollinator Habitat Plantings** established at greenhouse, high tunnel, and nursery sites provided the public with educational signs and brochures.

"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."

- Vermont High Tunnel Grower

Community education

Communities

- Students of the **Master Gardener Course** increased their knowledge of IPM and made changes to the way they garden or work with clients.
- Clients of the **Master Gardener Helpline** (home gardeners) adopted recommended IPM strategies to manage their pest problem. Changing these behaviors reduced pesticide use, saving up to $137 average annually per client.
- Students of the **Master Gardener Advanced Training Webinars** learned new information about specific garden IPM practices for pest, soil health, and introduced species management; indigenous plant use; and pollinator support. Sharing this knowledge with the general public reduced the use of pesticides in home gardens.
- **Pollinator Demonstration Gardens** established and maintained by Master Gardener volunteers throughout the state provided workshops, tours, and direct education for the public.

Gardening for Pollinators and Beneficial Insects *e*-book is a resource for home gardeners published by Vermont Extension Master Gardeners.

Assessing plant samples

Certification Workshop

Pest Diagnostics

- Attendees of **Plant Diagnostic Clinic** events increased knowledge of pests and IPM strategies for small fruit and vegetable crops, including high tunnel winter greens and tomatoes. Adoption of these strategies reduced pesticide use and increased farm profits.
- Clients of the **Plant Diagnostic Clinic** (commercial growers) adopted IPM practices as a result of the diagnosis and recommendations. Changing these behaviors reduced pesticide use, saving up to $600 average annually per client.
- Participants in the **Northeast Small Fruit and Vegetable Working Group** developed priorities for small fruit and vegetable crop production specialists, extension educators, agricultural service providers, and non-profit agricultural educators to promote IPM education, research, and regulations throughout the region.

"An essential service to Vermont growers; assistance over the years has saved thousands of pounds of produce on our farm."

- Plant Diagnostic Clinic Client

Pesticide Education

- Attendees of **Pesticide Certification Meetings** learned IPM practices including pesticide compatibility, avoiding herbicide resistance, rodenticide use standards, PPE and respirator safety, and Worker Protection Standards. Applicators were better prepared to take certification exams and maintain certification.
- ***The Pesticide Applicator* Newsletter** increased awareness of pesticide regulations and IPM practices to allow pesticides to be used more safely.
- **IPM and Pesticide Basics** presentations introduced pesticide regulations, reading labels, biopesticides, and exposure and risk to home gardeners to reduce the use of pesticides.
- **Pollinator IPM Training** participants increased knowledge of reducing pesticide risk and drift, state rules, and IPM practices to protect pollinators.

"Helps me better protect myself as an applicator of pesticides, better protect the public, and the environment ."

- Vermont Pesticide Applicator

Publications: Journals & Conference Proceedings

- Bradshaw, T. Question those assumptions: Success with modern orchard systems demands attention to the details. Proc. 2022 New England Vegetable & Fruit Conference. Manchester, NH. https://newenglandvfc.org/proceedings
- Bradshaw T., Autio, W. Blatt, S. Clements, J. Einhorn, T. Elkins, R. Fallahi, E., Francescatto, P., Lordan, J., Minas, I., Peck, G., Robinson, T., and Yao, S. 2023. Performance of 'Modi' apple trees after 5 years under Organic management as affected by several dwarf rootstocks in the 2015 NC-140 Apple Rootstock Trial. J Am Pom Soc. (APS) 77:14-27 http://www.pubhort.org/aps/77/v77_n1_a2.htm
- Bradshaw, T. and L.P. Berkett. Vineyard disease management that works: Using IPM to minimize pesticide applications while managing diseases in cold climate winegrape varieties. Proc. 2022 New England Vegetable & Fruit Conference. Manchester, NH. https://newenglandvfc.org/proceedings/
- Foster, J. Kingsley-Richards, S.L., and Bradshaw, T. 2022. Effect of Summer Hedging on Return Bloom, Yield, Tree Growth, and Juice Quality of Apples Grown for Cider. Acta Hortic. 1346, 439-446. https://doi.org/10.17660/ActaHortic.2022.1346.56
- Foster, J., Kingsley-Richards, S.L. and Bradshaw, T.L. 2022. Summer applications of NAA and ethephon show little effect on return bloom, yield, tree growth, and juice quality of cider apple cultivars. Acta Hortic. 1346, 511-518. https://doi.org/10.17660/ActaHortic.2022.1346.65
- Pelletier, B. and Bradshaw, T.L. 2024. Biorational pesticide efficacy in northern New England vineyards. Acta Hortic. 1387, 269-276. 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 Hortic. 1387, 39-48. https://doi.org/10.17660/ActaHortic.2024.1387.6
- Skinner, M. & C. Frank Sullivan. 2022. Plant Mediated Systems in High Tunnels. Mid-Atlantic Fruit and Vegetable Convention Proceedings. https://www.pvga.org/wp-content/uploads/2022/01/Mid-Atlantic-Conv.-Proceedings-22-Final.pdf
- Sullivan, C.F., Davari, A., Parker, B.L., Skinner, M. 2023. Evaluation of a guardian plant system to suppress *Frankliniella occidentalis* (Thysanoptera: Thripidae) in greenhouse ornamentals. Pest Manag. Sci. 79: 3559-3569. https://doi.org/10.1002/ps.7556

The ***IPM: Integrated Pest Management*** brochure is an introductory resource for home gardeners published by Vermont Extension Master Gardener in collaboration with the Vermont Extension Pesticide Safety Education Program.