

Progress Report

Title:	Vermont IPM Extension Implementation Program (VT EIP): 2021-2024		
Sponsoring Agency	NIFA	Project Status	ACTIVE
Funding Source	Non Formula	Reporting Frequency	Annual
Accession No.	1027204	Grants.gov No.	GRANT13321590
		Award No.	2021-70006-35509
Project No.	VTN-FP1180	Proposal No.	2021-05149
Project Start Date	09/01/2021	Project End Date	08/31/2023
Reporting Period Start Date	09/01/2021	Reporting Period End Date	08/31/2022
Submitted By	Stephanie Albaugh	Date Submitted to NIFA	06/03/2022

Program Code: EIP**Program Name:** Extension Implementation Program**Project Director**

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Recipient Organization

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Performing Department

Ext - Programming & Fac Sup

Co-Project Directors

Skinner, Margaret

Darby, Heather

Bradshaw, Terence

Departments

{NO DATA ENTERED}

Ext - Programming & Fac Sup

Plant & Soil Science

Non-Technical Summary

The VT EIP is aligned with IPM needs of the diverse crops and audiences in Vermont and includes the Primary Priority areas of IPM Implementation in: Agronomic Crops, Specialty Crops (Tree Fruit/Grapes, Greenhouse/High Tunnel/Nursery crops), Communities, and IPM for Pollinator Health. Secondary Priority areas of IPM Support for Pest Diagnostic Facilities and IPM Education for Pesticide Applicators will serve as resources for all Primary Priority areas. Each Priority area advances the goals of the CPPM program by developing new IPM tools and tactics promoted through education and outreach programs to increase adoption of IPM by new stakeholders, established growers and consumers that reduce pesticide use, crop losses due to pests and disease, decrease production costs and reduce health and environmental risks. National IPM Roadmap goals integrate through all program areas by promoting adoption of IPM in landscapes and gardens, mentoring students for a new generation of IPM scientists, tackling challenges of invasive and emerging pests and by forging collaborative relationships with northeast stakeholders and other CCPM programs to achieve long-term solutions to regional pest management challenges. The VT EIP includes specialists in plant pathology, entomology, horticulture, agronomy, pesticide education and community outreach. Each Priority area solicits stakeholder input on pest management challenges through surveys and develops IPM tactics and programs to meet those needs. Impacts of programs are shared on our VT EIP website and the VT IPM Stakeholder Advisory Team.

Accomplishments**Major goals of the project**

The overarching goals of the Vermont IPM program are to develop and promote effective education and outreach programs to improve IPM practices, reduce costs through those IPM practices, increase IPM adoption and reduce human and environmental

risks for our commercial growers and communities. Specific goals of each priority area are:

Agronomy-In this project we will identify the disease and pests that challenge northeast growers. Farmers will learn to ID pests in their fields, learn if their seed sources are disease free and learn the best agronomic practices to minimize pest damage. Our goal is to help farmers design robust crop systems that successfully address pest challenges to produce a

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diversity of food and feed grains while minimizing impacts on the environment.

Tree Fruit/Grapes-Goals include timely delivery of IPM information to apple and grape growers; orchard pest monitoring training and assessment, and 'natural' grape production evaluation. Outreach communications will integrate site- and region-specific weather and pest models based on NEWA information to provide timely information to growers

Greenhouse/High Tunnel/Nursery-Goals include addressing grower needs while improving environmental sustainability and profitability of the greenhouse industry in ME, NH and VT through IPM strategies learned at workshops, individual instruction, and outreach education.

Communities-Goals include educating home gardeners about pest identification and IPM strategies through a course, a statewide Helpline and outreach events.

Pollinator Health-Goals include educating growers and home gardeners on the importance of pollinator protection through agronomy outreach, habitat plantings, on-line presentations, and pesticide applicator training.

Pest Diagnostics-Goals include providing timely, accurate and cost-effective diagnostics to Vermont stakeholders so they can make informed management decisions based on IPM strategies.

Pesticide Education-Goals include providing IPM education for current and prospective pesticide applicators through training opportunities, newsletter, online IPM courses, and regional meetings.

What was accomplished under these goals?

Each facet of the VT EIP is begun progress on goals toward increasing the adoption of IPM practices in a variety of crops and settings to reduce the amount of pesticides used and lower costs while protecting the environment and human health. 88% of Agronomy Field Day participants have increased knowledge of prevalent pests, IPM practices to minimize yield and quality impact. Orchards and vineyards have been identified for developing the scouting and evaluation in 2022. Up to 78% of Greenhouse/High Tunnel/Nursery Tri-State IPM participants have learned new techniques they intend to use this year and increased knowledge of biological control use. 63% of Master Gardener Helpline clients implemented the IPM strategies recommended and 61% reduced or avoided the use of pesticides, saving \$137 per client on pesticide costs. Bee boxes have been installed for Tree Fruit Pollinator Community Assessment in 2022 and the Master Gardener E-Book "Gardening for Pollinators and Beneficial Insects: Resources for the Home Gardener" was published in September 2021. The Plant Diagnostic Clinic moderated session at the NE Vegetable and Fruit Conference Small Fruit sessions reached 7,688 acres in New England where 43% learned new pest management practices that will increase profits. The Pesticide Applicator Report aids 92% of Vermont pesticide applicators to apply and use pesticides more safely and adopt IPM practices. "Good reminders of certain PPE considerations that applicators can become lax over time about." Online training prepares pesticide applicators to take certification exams and to apply and use pesticides more safely & adopt at least one new IPM practices.

Please see the following accomplishments for more details.

Agronomy Field Days & Winter Conferences

- Fall Field Day
 - 88% increase knowledge of prevalent pests, IPM practices to minimize yield/quality impact

Greenhouse/High Tunnel/Nursery Tri-State IPM

- 88% average rating overall program, 90% average rating usefulness
- 78% learned new techniques they intend to use this year (testing quality of biocontrol agents, use of dips for incoming plug trays, use/rearing of rove beetles and other soil-dwelling biocontrol agents, and new information on pesticides/modes of action)
 - 63% increased knowledge of biological control use, biological control agent quality assessment, root disease id
 - 42% increased knowledge of disease monitoring
 - 38% increased knowledge of chemical pesticide use/integration

Master Gardener Helpline

- 72% received information on IPM strategies to address their questions
- 63% implemented the IPM strategies recommended
- 61% reduced or avoided the use of pesticides
- \$137 average individual saving in pesticide costs

Plant Diagnostic Clinic Extension Outreach Education

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- NE Vegetable and Fruit Conference-Online Small Fruit sessions (Berry Crops II)
 - 43% learned new pest management practices
 - 28% will increase profits
 - 7,688 acres represented in New England

Pesticide Applicator Report

- 227 recertification credits issued
- 92% apply and use pesticides more safely
- 56% adopt at least one new IPM practice
- "Good reminders of certain PPE considerations that applicators can become lax over time about."
- "We're paying more attention to timing of treatment."
- "The PAR is the only way I get exposure to the current information regarding pesticide use in VT."

Pesticide Applicator Extension Outreach Education

- On-demand online training
 - 100% moderately/very prepared to take the exam
 - 94% moderately/very likely to apply and use pesticides more safely & adopt at least one new IPM practice
 - 1 recertification credit issued

What opportunities for training and professional development has the project provided?

{Nothing to report}

How have the results been disseminated to communities of interest?

- **Agronomy** IPM information is distributed through field days, winter meetings, blogs, websites, webinars, Facebook posts, YouTube videos, phone calls, emails and social media. Conference proceedings and meeting videos will be posted to our website.
- **Tree Fruit/Grape** IPM information is distributed through newsletters, website, blog posts, factsheets, on-farm workshop, one-on-one consultations, and presentations at regional grower meetings. Information collected in surveys will remain confidential.
- **Greenhouse/High Tunnel/Nursery** IPM information is distributed through workshops, conferences, presentations, site visits, factsheets, websites, Facebook page and a listserv.
- **Master Gardener** IPM information is delivered through the Master Gardener Course, Master Gardener Helpline, advanced training, newsletter, state reports, website, and emails.
- **Pollinator** IPM information is distributed through each responsible program area networks.
- **Plant Diagnostic Clinic** IPM information is distributed through sample diagnosis, websites, meetings, presentations, webinars, newsletters, television, radio, factsheets, emails, and phone calls. Northeast Small Fruit and Vegetable IPM Working Group education/research priorities will be shared on the NE IPM center website.
- **Pesticide Applicator** IPM information is distributed through presentations, newsletters, online courses, factsheets, website, emails, and phone calls.

What do you plan to do during the next reporting period to accomplish the goals?**Continuation of objectives:**

- **Agronomy Field Days & Winter Conferences**
 - Planning for annual events
- **Hop and Hemp Disease Survey**
 - Survey for cone and flower diseases prior to harvest at northeast hop and hemp farms
- **Seed Quality Testing**
 - Offer annual seed quality testing for grains and beans
- **Agronomy Extension Outreach Education**
 - Ongoing activities (presentations, website, etc.)
- **Orchard Scouting Network**
 - Training/data collection at six selected orchards
- **Grape 'natural' production evaluation**

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- Pest damage, crop yield, and juice quality data collection at two selected vineyards
- Baseline survey result data analysis
- **Tree Fruit/Grape Extension Outreach Education**
 - Ongoing activities (presentations, website, etc.)
- **Greenhouse/High Tunnel/Nursery Tri-State IPM**
 - Planning for next event to be held 2023
- **Greenhouse/High Tunnel/Nursery IPM First**
 - Continue to offer individual grower instruction and IPM Factsheets on key pests
- **Greenhouse/High Tunnel/Nursery Extension Outreach Education**
 - Ongoing activities (presentations, website, etc.)
- **Master Gardener Course:**
 - Planning course to be held 2023
- **Master Gardener Helpline:**
 - Ongoing service answering questions on insect, weed, and disease problems and IPM strategies
- **Master Gardener Advanced Training**
 - Offer webinars with factsheets on emerging insect, weed, and disease problems and IPM strategies for management
- **Agromony Pollinator Education**
 - Develop Pollinator Protection Briefs, Protecting Pollinators in Field Crops Bulletin
- **Tree Fruit Pollinator Community Assessment:**
 - Habitat hedges will be installed in 2022
 - Evaluating on orchards and surrounding habitat in summer 2022
 - Data presentation once per year, end of season
- **Greenhouse/High Tunnel/Nursery Pollinator Plantings**
 - Establish habitat plantings and bee nesting boxes
- **Master Gardener Pollinator Education**
 - Develop on-line presentation (habitat hedges and creating nest boxes for native bees) with factsheets
- **Pesticide Education Pollinator IPM Training**
 - Develop pollinator module for Initial Pesticide Certification Meetings
 - Invite pollinator speakers to Commercial Pesticide Applicator Meeting 2022
- **Plant Diagnostic Clinic Diagnostics**
 - Continue to provide stakeholders with rapid and accurate diagnosis and current IPM recommendations that consider pollinator health.
- **Northeast Small Fruit and Vegetable IPM Working Group**
 - Compile survey results to rank priorities
- **Plant Diagnostic Clinic Extension Outreach Education**
 - Ongoing activities (presentations, website, etc.)
- **Pesticide Certification Meetings**
 - Initial Pesticide Certification Meeting 4/19/22, 4/21/22
 - Commercial Pesticide Applicator Meeting 3/28/22
- **Pesticide Applicator Report**
 - Spring 2022, Fall 2022 issues
- **IPM and Pesticide Basics**
 - Establish online platform, consult with Master Gardener, outline course
- **Pesticide Applicator Extension Outreach Education:**
 - Webinar pesticide credit administration Northeast Extension Fruit Consortium Winter Webinar Series (7 events)
 - Ongoing activities (presentations, website, etc.)

Participants

Actual FTE's for this Reporting Period

Role	Non-Students or faculty	Students with Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Scientist	0.1	0	0	0	0.1
Professional	0.9	0	0	0	0.9

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Actual FTE's for this Reporting Period

Role	Non-Students or faculty	Students with Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Technical	0.4	0	0	0	0.4
Administrative	0.3	0	0	0	0.3
Other	0.5	0	0	0	0.5
Computed Total	2.2	0	0	0	2.2

Student Count by Classification of Instructional Programs (CIP) Code

{NO DATA ENTERED}

Target Audience

Commercial field, forage and oil seed growers, vegetable and berry growers, apple and grape growers, nursery and greenhouse operators, landscapers, pesticide applicators, Master Gardeners, beekeepers, home gardeners and general public.

Products

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	NO

Citation

Bradshaw, T. & S. Kingsley-Richards. 2021. Commercial Horticulture: Tree Fruit. <https://www.uvm.edu/extension/horticulture/tree-fruit>

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	NO

Citation

Bradshaw, T. & S. Kingsley-Richards. 2021. Commercial Horticulture: Grapes. <https://www.uvm.edu/extension/horticulture/grapes>

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	NO

Citation

Darby, H. 2021. Northwest Crops and Soils Program. <https://www.uvm.edu/extension/nwcrops>

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	NO

Citation

Darby, H. 2021. Champlain Valley Crop, Soil and Pasture Team. <https://www.uvm.edu/extension/cvcrops>

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Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Awaiting Publication	2022	YES

Citation

Foster, J., Kingsley-Richards, S.L., and Bradshaw, T. Summer Applications of NAA and Ethephon Show Little Effect on Return Bloom, Yield, Tree Growth, and Juice Quality of Cider Apple Cultivars. Acta Horticulturae.

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	YES

Citation

Hazelrigg, A. 2021. Plant Diagnostic Clinic. <https://www.uvm.edu/extension/pdc>

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	YES

Citation

Hazelrigg, A. 2021. UVM Extension Master Gardener. <https://www.uvm.edu/extension/mastergardener>

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	YES

Citation

Hazelrigg, A. & S. Kingsley-Richards. 2021. Pesticide Safety Education Program. <https://www.uvm.edu/extension/psep>

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2022	YES

Citation

Skinner, M. & C. Frank Sullivan. 2022. Plant Mediated Systems in High Tunnels. Mid-Atlantic Fruit and Vegetable Convention Proceedings.

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	YES

Citation

Sullivan, C.E.F. and Skinner, M. 2021. Greenhouse IPM: <https://www.uvm.edu/~entlab/Greenhouse%20IPM/UVMGreenhouseIPM.html>

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	YES

Citation

Sullivan, C.E.F. and Skinner, M. 2021. High Tunnel IPM: <https://www.uvm.edu/~entlab/High%20Tunnel%20IPM/HighTunnelIPM.html>

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Type	Status	Year Published	NIFA Support Acknowledged
Websites	Published	2021	YES

Citation

Sullivan, C.E.F. and Skinner, M. 2021. Landscape IPM:
<https://www.uvm.edu/%7Eentlab/Landscape%20IPM/LandscapeIPM.html>

Other Products**Product Type**

Other

Description

Agronomy Field Days & Winter Conferences

- Fall Field Day: hemp, small grains seed health relationship to crop health/yields. 10/22/21 (116 attendees)

Product Type

Other

Description

Agronomy Extension Outreach Education

- 2 blog posts (174 subscribers) <http://blog.uvm.edu/outcropn>: Industrial Hemp Regional Scouting Pest Survey update, When to Test for Aflatoxins

Product Type

Data and Research Material

Description

Orchard Scouting Network

- 6 orchards identified. Training/data collection to follow previously established methods

Product Type

Data and Research Material

Description

Grape 'Natural' Production Evaluation

- 2 vineyards identified
- Baseline survey sent February 2022, data analysis being completed

Product Type

Other

Description

Tree Fruit/Grape Extension Outreach Education

- 163 subscribed to vtapplegrower@list.uvm.edu listserv; 295 subscribed to vermontgrape@list.uvm.edu listserv
- 24 UVM Fruit blog posts <http://go.uvm.edu/ogreu>
- 24 grower consultations
- New England Tree Fruit Management Guide updates, 2022 <https://netreefruit.org/>
- Presentations (attendees):
- Northeast Cider Apple Project. Northeast Extension Fruit Consortium Winter Webinar Series, 3/22/22 (100)

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- Moderator: Apple, Cherry and Peach Cultivars Panel. Northeast Extension Fruit Consortium Winter Webinar Series, 1/25/22 (121)
- Apple disease identification & management. UVM Master Gardener Summer program, 9/04/21 (12)

Product Type

Other

Description

Greenhouse/High Tunnel/Nursery Tri-State IPM

- 25th annual workshop held virtually in 2 sessions (below-ground biological control agents, new insecticides and miticides for greenhouse production systems, how to check the quality of biocontrol agents before release, demo how to use biological 'dips' to remove pests on cuttings) 1/20/22, 1/27/22 (>85 attendees) <https://go.uvm.edu/nd61t>

Product Type

Educational Aids or Curricula

Description

Greenhouse/High Tunnel/Nursery IPM First

- 40+ growers provided ongoing support as needed
- 3 new operations requested site visits during ornamental production season (March 2022)
- 60+ consultations (site visits, email exchanges, phone calls, insect id requests, etc.)

Product Type

Other

Description

Greenhouse/High Tunnel/Nursery Extension Outreach Education

- 4 presentations (110 attendees)
- On-site demonstration: Identifying beneficials visiting habitat plantings, St. Michaels College, 9/13/21 (25 attendees)

Product Type

Other

Description

Master Gardener Helpline

- 160 questions answered
- Transitioned to ASK EXTENSION online platform

Product Type

Other

Description

Master Gardener Advanced Training

- Factsheet "Plant Sale Guidelines to Minimize the Chance of Jumping Worm Spread" published February 2022 (distributed to 436 volunteers)
- Soil Health webinar: Nutrient Management Planning for Lawn & Garden. UVM Master Gardener Helpline Annual Spring Training 3/9/22 (19 attendees)

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Product Type

Data and Research Material

Description

Tree Fruit Pollinator Community Assessment:

- Bee boxes installed for 2022 season

Product Type

Data and Research Material

Description

Greenhouse/High Tunnel/Nursery Pollinator Plantings

- 1 presentations (25 attendees)

Product Type

Other

Description

Master Gardener Pollinator Education

- E-Book "Gardening for Pollinators and Beneficial Insects: Resources for the Home Gardener" published September 2021 (distributed to 3,740 stakeholders)

Product Type

Educational Aids or Curricula

Description

Pesticide Education Pollinator IPM Training

- Presentations scheduled for 2022.

Product Type

Other

Description

Plant Diagnostic Clinic Diagnostics

- 130 samples diagnosed for commercial growers in 2021 growing season
- Client survey in progress

Product Type

Other

Description

Northeast Small Fruit and Vegetable IPM Working Group

- Met online with New England small fruit and vegetable specialists to develop priorities, 1/26/22
- Survey to rank priorities in progress

Product Type

Other

Description

Plant Diagnostic Clinic Extension Outreach Education

- 11 presentations; 3 workshops
- Regular contributor on pest and disease issues to UMass Veg Notes, VT Veg & Berry listserv, quarterly VT

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Nursery and Landscape newsletter

- Co-moderator: NE Vegetable and Fruit Conference-Online Small Fruit sessions (Berry Crops II), 11/16/21 (216 attendees, 42 views of recorded content)

Product Type

Other

Description

Pesticide Certification Meetings

- 2 meetings scheduled for April 2022

Product Type

Other

Description

Pesticide Applicator Report

- Fall 2021 issue (1574 subscribers)

Product Type

Educational Aids or Curricula

Description

IPM and Pesticide Basics

- Course platform determined.

Product Type

Other

Description

Pesticide Applicator Extension Outreach Education

- Presentation: Navigating USAPlants for pesticide credit records and courses, Vermont Tree Fruit Growers Association Annual Meeting (21 attendees)
- Factsheet: Mold Remediation Guidelines
- On-demand online training (participants)
 - CORE Manual Review (no credit) (4)
 - CORE Manual Review, Unit #1 (1 credit) (1)
 - CORE Manual Review, Unit #3 (1 credit) (1)
 - Managing Pests While Protecting Pollinators (1 credit) (1)
 - Category 7A Manual Review (no credit) (1)
 - Category 7A Manual Review, Unit #4 (1 credit) (1)

Changes/Problems

- Master Gardener Course: not offered in 2022 due to staff changes
- No changes/problems of note for other program areas.