# United States Department of Agriculture

Final	Re	port
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Title:	Vermont IPM Extension Implementation Program: 2017-2020			
Sponsoring	Agency	NIFA	Project Status	COMPLETE
Funding Sou	ırce	Non Formula	Reporting Frequency	Final
Accession N	lo.	1013802	Grants.gov No.	
			Award No.	2017-70006-27143
Project No.		VTN32287	Proposal No.	2017-04388
Project Start	Date	09/01/2017	Project End Date	08/31/2022
Reporting Po	eriod Start Date	09/01/2017	Reporting Period End Date	08/31/2022
Submitted B	У	Stephanie Albaugh	Date Submitted to NIFA	09/28/2022

### Program Code: EIP

#### **Project Director**

Ann Hazelrigg 802-355-0144 ann.hazelrigg@uvm.edu

### **Recipient Organization**

UNIVERSITY OF VERMONT & STATE 85 S PROSPECT ST BURLINGTON, VT 054051704 DUNS No. 066811191

### **Co-Project Directors**

Skinner, Margaret Darby, Heather Bradshaw, Terence

### **Non-Technical Summary**

The Vermont Extension Implementation Program includes specialists in plant pathology, entomology, horticulture, agronomy, pesticide education, weed science and community outreach. A program coordinator and an evaluation specialist also play critical roles, maximizing communication and cooperation among Priority area teams. The VT EIP team has strong relationships with stakeholders and addresses IPM needs in the following Primary Priority areas: Agronomic Crops; Specialty Crops; Communities and IPM for Pollinator Health. Secondary Priority areas of IPM Support for Pest Diagnostic Facilities and IPM Education for Pesticide Applicators serve as overarching resources for all Primary Priority areas. The goals of the VT EIP are to develop and promote effective education and outreach programs to imprd p

Program Name: Extension Implementation Program

#### **Performing Department**

Ext - Programming & Fac Sup

### Departments

{NO DATA ENTERED} Ext - Programming & Fac Sup Plant & Soil Science

and disease diagnosis and IPM recommendations.

Greenhouse/high tunnel-Goals include addressing grower needs while improving environmental sustainability and profitability of the greenhouse industry in ME, NH and VT by reducing losses from arthropod pests and increasing growers' revenues through IPM strategies learned at workshops and individual site visits.

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

IPM for Pollinators-Goals include educating growers and gardeners on the importance of pollinator protection through an orchard pollinator survey, through pilot habitats and through a home garden IPM short course.

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 developing trainings on pollinator health to key stakeholders targeting pesticide applicators in apple orchards, in blueberries and for applicators in the nursery/greenhouse ornamentals industry

#### What was accomplished under these goals?

### Highlights: September 2017 - August 2022 https://go.uvm.edu/2q8hr Agronomy Field Days and Winter Conferences

- 92-96% allowed to better scout/identify/manage pests with IPM system in hops and grains
- 86% helped to test for grain mycotoxin, seedborne disease

• 64-89% changed management practices, increased biological control, plant-mediated IPM, scouting, identification,

## nutrient management, decreased pesticide use

• 15-17% adopted strategies for insect pest management (predators, organic methods, parasites, nematodes, conventional pesticides)

• 47% reduced chemical pesticide use by >25%; 51% reduced chemical pesticides by >50%

## Greenhouse/High Tunnel/Nursery IPM First

- 100% use IPM strategies to manage pests (biopesticides, natural enemies, scouting, trap/habitat plants)
- 100% use biocontrols as chemical pesticide alternatives, reduced chemical pesticides
- 67-100% use plant-mediated IPM systems regularly

## Greenhouse/High Tunnel/Nursery Extension Outreach Education

• 100% of webinet viewers indicated the style of learning tool was useful to increase grower's knowledge on the biology and identification of IPM practices

## Master Gardener Course

- 59-98% never/rarely/sometimes/not sure of using IPM before the course
- 55-99% likely to adopt IPM gardening practices; 36% had already changed their IPM practices as a result of this course
- 84% always/regularly currently use IPM practices in their garden
- 45% have reduced use of pesticides

• "I learned a lot of useful and important information that I can directly apply to my gardening and property management techniques"

- "I appreciate learning about science-based information to help me garden and reduce the use of pesticides"
- "Encourage and assist neighboring gardeners in the community plot to identify pests and diseases. Suggest non-toxic/organic products and practices for control."

## Master Gardener Helpline

- 36-78% clients used IPM to manage their pest problem
- 24-60% clients were able to reduce pesticides
- \$137-\$250 average per client estimated cost savings by reducing pesticide use
- "I was able to start making helpful gardening changes right away and have a plan for better prevention next season."
- "I got answers that addressed my specific concerns in a timely way that allowed me to move forward with the

understanding I needed for success."

• "Helped me to make the problem somewhat better without any pesticides at all."

## Master Gardener Advanced Training Webinars

- 95-100% will improve use of IPM practices when trying to manage pests
- 20-100% will reduce use of pesticides

• "I appreciate the opportunity to receive current, comprehensive information about an important subject which we can share more broadly with the public"

• "I learned some tricks about pest management to optimize my crops and reduce damage by pests without resorting to pesticides"

## Greenhouse/High Tunnel/Nursery Pollinator Habitat Program

- 88% did not use habitat plantings prior to program
- 63-88% moderate/considerable knowledge of beneficial id/life cycles, plants to attract beneficials
- 100% continue to use habitat planting systems

## Master Gardener Pollinator Short Course

- 100% will improve use of IPM practices when trying to protect pollinators in the landscape
- 100% of those who use pesticides will reduce use of pesticides
- "It covered all aspects of the topic and motivated me to do all I can on my own land to protect these important species."
- "Learned more about IPM techniques and identifying pests, beneficial pollinators"
- "Now know the proper formulations, timing, and techniques for pesticide application to reduce harm to pollinators"

## Plant Diagnostic Clinic Disease/Insect/Weed Diagnostics "

Accession No. 1013802	Project No. VTN32287
• 71 06% commorcial cliente	paid diagnostic ID beload to manage their past problem with IDM

71-96% commercial clients said diagnostic ID helped to manage their pest problem with IPM
21-75% commercial clients were able to reduce pesticides as a result of the IPM information

{NO DATA ENTERED}

### **Target Audience**

Target audiences include commercial agricultural operators and associated industry such as crop consultants, professional pest managers, extension educators, researchers and similar stakeholders. Commercial operators include: organic and conventional growers of specialty crops, field crops and forages, new and established grain/dry bean/hop farmers, apple growers, grape growers, blueberry growers, growers of greenhouse ornamentals/cut flowers/high tunnel vegetables, growers of landscape/perennial/nursery stock, and product end-users such as brewers, distillers, maltsters, chefs, bakers, andof opsps,

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## United States Department of Agriculture Final Report

Accession No. 1013802	Project No. VTN32287	,	
Туре	Status	Year Published	NIFA Support Acknowledged
Other	Published	2022	NO
	tions from the UVM Diagnost VT. https://vnlavt.org/news-ev		. 48(2). VT Assoc. of Professional
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	ations from the UVM Diagnost		48(1). VT Assoc. of Professional
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	ations from the UVM Diagnost VT. https://vnlavt.org/news-ev		17(4). VT Assoc. of Professional
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	ntions from the UVM Diagnost VT. https://vnlavt.org/news-ev	ic Lab. The Dirt, Fall. Vol. 47( /ents/the-dirt/	3). VT Assoc. of Professional
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	ations from the UVM Diagnost Ferrisburgh, VT. https://vnlav	ic Lab. The Dirt, Winter/Spring t.org/news-events/the-dirt/	g. Vol. 46(4). VT Assoc. of
<b>Type</b> Other	<b>Status</b> Published	Year Published 2020	NIFA Support Acknowledged NO
Citation			

Hazelrigg, A. 2020. Observations from the UVM Diagnostic Lab. The Dirt, Fall. Vol. 46(3). VT Assoc. of Professional Horticulturists. Ferrisburgh, VT. https://vnlavt.org/news-events/the-dirt/

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Dither     Published     2020     NO       Citation     Parker, B.L., A. Davari & M. Skinner. 2020. Can Western Flower Thrips be managed without insecticides? American Floral Endowment Thrips & Botrytis Newsletter, Fall 2020, Issue 3.     NIFA Support Acknowledged       Conference Papers and     Published     2019     NO       Citation     Published     2019     NO       Citation     Status     Year Published     NIFA Support Acknowledged       Citation     Status     Year Published     NIFA Support Acknowledged       Citation     Published     2017     NO       Citation     Status     Year Published     NIFA Support Acknowledged       Dither     Published     2017     NO       Citation     Status     Year Published     NIFA Support Acknowledged       Dither     Published     2017     NO       Citation     Status     Year Published     NIFA Support Acknowledged       Other     Published     2021     NO       Citation     Status     Year Published     NIFA Support Acknowledged       Status     Year Published     NIFA Support Acknowledged       Other     Published     2021     NO       Status     Year Published     NIFA Support Acknowledged       Other     Published     2021	Accession No. 1013802	Project No. VTN32287	,		
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	Citation				

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Book Chapters	Published	2019	NO
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уре	Status	Year Published	NIFA Support Acknowledged
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	, M. 2022. Greenhouse Integ /Greenhouse%20IPM/UVMG	rated Pest Management Web reenhouseIPM.html	site:
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Research Laboratory. Tri-State Greenhouse IPM Workshops. Manchester, ME., Durham, NH & Burlington, VT. 2020.

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Туре	Status	Year Published	NIFA Support Acknowledged
onference Papers and	Published	2019	YES
Intomology Research Labo	pratory. PennState Ag Progre ab/High%20Tunnel%20IPM/F	ing Aphid Natural Enemies in ss Days, Rock Springs, PA. A actsheets/Habitat%20Plants%	
уре	Status	Year Published	NIFA Support Acknowledged
conference Papers and	Published	2019	YES
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Conference Papers and	Published	2019	NO
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Entomology Research Labo https://www.uvm.edu/~entla	pratory. PennState Ag Progre		
уре	Status	Year Published	NIFA Support Acknowledged
onference Papers and	Published	2019	NO
	er. 2019. Attracting & Sustain tion Conference Manchester		High Tunnels. Expand Your Tunnel
уре	Status	Year Published	NIFA Support Acknowledged
other	Published	2019	YES
<b>Citation</b> Sullivan, C. Frank & Skinne	r, M. 2019. Bringing in Un-Be	ee-lievable Beneficials. The Di	rt. Winter Issue Vol. 44(4):23-24.
Туре	Status	Year Published	NIFA Support Acknowledged
Other	Published	2019	YES
	r, M. 2019. Habitat Plantings µ/vtvegandberry/Pubs/Habitat		s. VT Vegetable &Berry Newsletter
уре	Status	Year Published	NIFA Support Acknowledged
conference Papers and	Published	2017	NO
litation			
Sullivan, C.F & M. Skinner.		et natural enemies into high tu Manchester, NH. Proceedings	nnel crops. New England Vegetable

### **Other Products**

### Product Type

Other

### Description

Agronomy Field Days and Winter Conferences • 10 events, 836 attendees: Annual Hops Conf, Virtual Hops Conf, Annual Grain Growers Conf, Virtual Grain Conf, Champlain Valley Hops Field Day, Virtual Field Day Fridays

### **Product Type**

Data and Research Material

### Description

Dry Bean Disease Survey

- 5 farms (75 acres total, VT & MA) surveyed in 2018 & 2019 seasons for pests
- Farmers invited to participate, assisted with scouting 75% of the time

### **Product Type**

Data and Research Material

### Description

Seed Quality Testing

- 804 samples analyzed for disease, mycotoxins, germination (small grains, dry beans, corn, hemp)
- 30 samples. Farmers requested mycotoxin testing expanded to include aflatoxin.

### Product Type

Other

### Description

Agronomy Extension Outreach Education

- 18 webinars, 261 attendees: Hop Power Hour
- 19 Hop Blog Posts blog.uvm.edu/hoppenin
- 6 Agronomy Blog posts (195 subscribers) blog.uvm.edu/outcropn
- Online course of Hops Conf campus.extension.org
- Hop goScout surveys (introductory, training, crowning, scouting, irrigation, harvest timing)
- Virtual Reality Scouting Tool for Hop Growers (VRScout Hops) completed, presented at 2019 Hops Conf go.uvm.edu/3myft
- 4 IPM guides:
- Northeast Dry Bean Pest Guide go.uvm.edu/ywd0p
- Cereal Rye Production Guide go.uvm.edu/ky5n6
- Seed Disease and Organic Management for Cereals Grown in the Northeast go.uvm.edu/7u0y3
- The European Corn Borer in Hops and Hemp go.uvm.edu/k8iwn

## **Product Type**

Data and Research Material

### Description

**Orchard/Vineyard Scouting Network** 

- 12 orchards + 1 vineyard scouted weekly, 2018 & 2019 season
- Third-party online reporting platform trialed

### Final Report

## Accession No. 1013802 Project No. VTN32287

Farmers & Gardeners Assoc, Penn State Ag Progress Days, Virtual High Tunnel Production Conf, UVM Virtual Grower-to-Grower Session, VT Veg & Berry Growers Assoc. 2020 Webinar Series

- 14,000+ views greenhouse/high tunnel/landscape IPM webpages
- 4,100 followers Entomology & Saffron Facebook
- 460 subscribed GreenGrower listserv
- 9 Factsheets/Articles

## **Product Type**

Educational Aids or Curricula

## Description

Master Gardener Course

• 4 courses, 498 attendees: annual Master Gardener Course delivered through web platform

• 1,405 EMG volunteers, 414 projects/events, 56,321 hours making contacts with the public about pesticide reduction, pest identification, IPM strategies

## Product Type

Other

## Description

Master Gardener Helpline

• 4,892 questions answered by phone/email

• 253 specimens submitted for pest identification

## **Product Type**

Other

## Description

Master Gardener Advanced Training Webinars • 15 events, 543 attendees: annual workshops/webinars

## **Product Type**

Data and Research Material

## Description

Orchard Pollinator Survey