

Progress Report

Title:	Supporting IPM on Diverse Massachusetts Farms through the Integration of Applied Res & Ext Outreach		
Sponsoring Agency	NIFA	Project Status	ACTIVE
Funding Source	Non Formula	Reporting Frequency	Annual
Accession No.	1013932	Grants.gov No.	
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Reporting Period Start Date	09/01/2019	Project End Date	08/31/2020
Submitted By		Reporting Period End Date	08/31/2020
		Date Submitted to NIFA	

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

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Recipient Organization

UNIVERSITY OF MASSACHUSETTS
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Performing Department

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Co-Project Directors

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Departments

U of Massachusetts Extension
Extension

Non-Technical Summary

Massachusetts is the 3rd most densely populated state; MA farm land is very valuable and often sought after for development. Despite this pressure, farmers steward over 523,500 acres, >10% of the MA land base. There are 7,755 farms (of which 2,651 are vegetable, berry, and fruit farms) in the state. The total number of farms has been steady since 2007, however the number of vegetable farms increased by more than 400 (28%) in the same time frame. Averaging 68 acres in size, 95% of MA farms easily fit the USDA definition of small farms, bringing in less than \$64,000 annually. Even with constant economic and biological pressures, MA farmers are committed to being efficient business owners and effective pest managers, optimizing the output of their small-scale specialty crop farms to meet consumer demands. MA farms generate over \$490 million in total sales per year with 47% from sales of specialty crops such as apples, strawberries, and cucurbits. MA has almost 300 farmers' markets and ranks 1st nationally by percentage of farms with Community Supported Agriculture (CSA).

Through increased adoption and implementation of effective IPM strategies, this EIP Project will support National Integrated Pest Management (IPM) Road Map goals of achieving increased profitability while reducing human health and environmental hazards. We will address stakeholder-identified priorities by integrating applied research and outreach activities for specialty crop growers in Massachusetts. Massachusetts produces more than 70 types of specialty crops and many of the farmers we work with grow more than 30 different crops on their farms. This project will focus on whole-farm IPM approaches tailored to fit diverse specialty crop growers. Specific commodity issues identified as high priorities by growers will be addressed through our applied research and demonstration trials and outreach programs.

We will promote IPM implementation by working closely with individual growers to adopt and apply IPM practices on their farms, conduct applied research trials to address grower-identified issues, host hands-on training and education, and collaborate with state agencies and Northeastern Extension personnel to develop and disseminate innovative educational and training resources. Evaluation and economic specialists on our team will provide expertise to increase our understanding of the influence of environmental and socioeconomic factors that affect farming decisions. We will use our current working relationships with individual stakeholders to engage Mentor, Partner, and Collaborator farmers, an outreach model we have successfully deployed over the past 6 years. Our leadership and partnership roles with Extension colleagues in New England

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and industry and regulatory organizations will continue to further IPM implementation for specialty crop farms in MA. Responding to stakeholder-identified needs, we will expand our skill capacity by participating in professional development programs to improve technical and educational support for MA specialty crop growers.

Accomplishments**Major goals of the project**

Our Project has Three Overall Goals:

1. Improve IPM practices and strategies related to emerging, invasive, and established pests of specialty crops;
2. Increase IPM implementation and promote whole-farm sustainability through outreach and training activities and demonstrating effective technological strategies; and
3. Promote adoption of IPM by expanding and improving the skill capacity of Extension personnel, IPM practitioners, and growers.

Specific objectives for Goal 1 include establishing research and demonstration trials on Partner Farms, including University research stations, and obtaining monitoring data from Collaborator Farms that will direct management decisions and improve outcomes for the grower community at-large. Goal 2 objectives include training Mentor Farmers, providing timely diagnostics, bridging language barriers, and participating in regional digital reporting systems. Goal 3 objectives include acquiring skills in farm business management and information technology as well as obtaining and providing expanded capacity in weed research/outreach for vegetable and fruit farmers.

What was accomplished under these goals?**Goal 1: Improve IPM Practices and Strategies for Emerging and Established Pests****Emerging Pests that Affect Multiple Specialty Crops (65% complete).**

•12 MA sites checked weekly for **BMSB**. Data shared with MDAR and UMass Extension. "Ghost" traps, the novel "attract-and-kill" strategy were deployed on 5 partner farms.

- Collaborated in augmented mapping information distribution network (iPIPE, now AgPest/EddMaps).
- Monitored **scale** populations on 28 cranberry farms, processed 218 samples and addressed emerging pests including

Allium leafminer fly and downy mildews (DM) in lettuce and spinach.

- Conducted 1 replicated trial evaluating DM resistant varieties of spinach for NE winter production.

Advanced Apple IPM (65% complete).

- Achieved implementation of grower-sufficient fireblight (FB) risk management.
- Conducted apple scab (AS) spore observations at UMass Cold Spring Orchard to determine duration of primary spore availability.
- Trained growers on AS and FB model output use.
- Consistently demonstrated effectiveness of semiochemical based attract-and-kill strategies for plum curculio (PC) and other key pests.
- Assessed pathogenic nematodes suppression for PC ground-dwelling stages in commercial farms.

Brassica IPM (85% complete).

- Our network of 5 researchers in 4 states worked with 15 growers to implement BMPs in brassicas, and conducted 9 replicated trials on alternative pest management strategies.
- Wrote 10 newsletter articles, factsheets and reports; conducted 5 webinars with live attendance and video views totaling >1,047 growers and service providers; held 3 field days with 150 attendees.

Efficacy of Organic Pesticides (75% complete).

- Conducted replicated trials evaluating host-resistance to manage diseases without use of pesticides, a valuable strategy for organic growers whose choices of fungicides are very limited.
- We trained 10 undergraduate students on organic IPM.

Goal 2A: Increase IPM Implementation and Promote Whole-Farm Sustainability through Outreach and Training Activities**Training scouts and IPM implementation on Mentor Farms (65% complete).**

- Hosted our annual Advisory Group meeting and discussed priorities (18 attendees).
- Regularly visited 14 Mentor Farms to scout and provide hands-on training. Growers were interviewed to determine implementation success and challenges.

Provide timely and accurate specialty crop disease diagnostics (75% complete).

- Pest diagnostics, fungicide efficacy, and forecasting are the focus of our outreach programs and field day events.
- Made 43 site visits, processed 299 samples, had >120 phone consultations related to cranberry scale.

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Conduct Workshops and Training (65% complete) (numbers down due to Covid-19 restrictions).

- Conducted one workshop on SWD identification and management (50 attendees).
- Published the 28th Annual March Message, providing information on cutting-edge research-based pest control to MA and NE fruit tree growers.
- Held 8 twilight meetings (300 attendees) and one field day (110 attendees).
- Conducted 4 WPS trainings (42 attendees) and worked with MDAR and UMass pesticide programs to host 1 WPS train-the-trainer session.
- We held a "how-to" diagnostics workshop for growers (35 attendees).
- We did one-on-one trainings and education on resistance management (53 attendees).
- 20 workshops and trainings were held (840 attendees) targeting organic growers, nutrient management, bee conservation.

Bridge Language Barriers (55% complete).

- We evaluated survey responses and worked with collaborating institutions (CISA) and farmers to prioritize production of Spanish-language resources.
- Created a general Spanish-resource page, with vegetable production resources, and a Food Safety page, listing specifically food safety-related resources.

Promote Commonwealth Quality Program (CQP) (85% complete).

- Our Vegetable and Fruit Teams partnered with MDAR in on-farm and classroom trainings to prepare inspectors/auditors to use the IPM checklists.
- Work on the Cranberry CQP was completed and is posted on MDAR website.

Goal 2B: Increase IPM Implementation and Promote Whole-Farm Sustainability through Demonstrating Effective Technological Strategies**Digital Recordkeeping (60% complete).**

- Team members continued to seek software/platforms to serve this need, investigating versatility of Farm Dog app and AgPest/EddMaps to determine feasibility of record keeping in those platforms.

Optimizing Technology Utilization on Specialty Crop Farms (70% complete).

- Held 1 workshop on the use of unmanned aircraft systems (UAS) in cranberry (10 attendees).
- Published 1 fact sheet on agrivoltaic panels on cranberry farms.
- Reviewed 16 proposals for dual-use of solar energy on specialty crop farms; 10 were approved.
- Utilized MyIPM workgroup session to leverage phones for creating phone-friendly apps.
- Installed 8 new weather stations with microclimate sensor potential.

Using Integrated Pest Information Platform for Extension and Education (iPiPE) (65% complete).

- We installed monitoring systems and gathered information on Collaborator farms. Information shared with our regional Extension colleagues to inform IPM decisions across state lines.

Weather Stations and Sensors (75% complete).

- Communications with growers about stations and data were accompanied with advice and questions about IPM and decision support systems (DSS) as supported by the NEWA platform.
- Approximately 50 tree fruit growers are steady users of models for apple scab disease, fire blight disease, and summer diseases as well as plum curculio, apple maggot, and other insects.
- Produced 1 video on using NEWA to determine apple scab infection risk and access weather forecast.

Goal 3: Promote IPM Adoption by Improving and Expanding Skill Capacity and Evaluating Progress**Business Management and IPM Decision Making (65% complete).**

- Extension Team Members worked with resource economists and growers to guide our examination of factors that influence whole-farm management decisions.
- We hosted a workshop on enterprise budget development (18 attendees).

Weed Management (65% complete).

- Secured registration of a new herbicide in cranberry, expanding mode of action options.
- Conducted 5 workshops to promote effective weed IPM on specialty crop farms (1287 attendees).
- Conducted 1 Partner Farm project (pronamide on new cranberry vines) and weed IPM support was provided to fruit and vegetable growers via field walks, newsletter articles, pest alerts, and workshops.
- Developed and delivered a weed identification quiz at a regional meeting to determine growers' ability to accurately identify problem weeds on farm (80 respondents).

Information Technology (IT) Professional Development (75% complete).

- Extension personnel held 10 virtual grower workshops (ca. 650 attendees).
- Conducted 3 fruit-growing webinars (195 attendees). Video presentations posted to YouTube.
- Initiated Podcast component to Healthy Fruit.

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Assessing Change in Behavior and Condition from IPM Extension Efforts (50% complete).

- Improved evaluation process to capture increasing knowledge and confidence in implementing IPM, as well as longer-term impacts.
- Two growers adopted the use of synthetic lures and perimeter-row applications of insecticide mixed with sugar as a phagostimulant for reduced-input management of apple maggot fly. Insecticide applications were reduced by at least 70%.

Total number of peer-reviewed publications: 0 (2 noted published during reporting period, but mentioned in last year's report).

Total number of nonpeer-reviewed publications: 12

Total number of presentations: 36 in person; 12 internet-based

Total number of people reached: >1,200 at talks/webinars, >4,400 newsletter subscribers

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

The EIP team held our advisory group meeting on March 9, 2020, Grafton, MA with 18 attendees. We use this forum to generate feedback for the project, provide training on special topics, and to recruit mentor and partner farms as needed. The Tree Fruit team attended MyIPM app content development sessions in Clemson, SC, Oct 8-10, 2019.

The Tree Fruit Team attended the iPiPE Mixer at North Carolina State University to participate in future planning of the projects next phase as Ag-Pest Monitor/EDDMaps. The team learned about multiple other existing agricultural data aggregation and sharing platforms.

Garofalo, Piñero, Clements, and Cooley attended the New York/New England/Canadian Fruit Pest Management Working Group, 80th Annual New England, New York, and Canadian Fruit Pest Management Workshop. Burlington, VT. October 21-23, 2019. The IPM team produced the Massachusetts IPM Report for 2019. Clements gave an App guy update at this WG meeting and presented additional app information at the Massachusetts Fruit Growers' Association Annual Meeting held in Leominster, MA.

Garofalo attended International Apple Pathology Working Group 25. Odense, DK. January 16-21, 2019.

Garofalo hosted Dr. Cameron Peace, Washington State University in collaboration with the Stockbridge School of Agriculture and Franklin County Cider Days and the Franklin County Chamber of commerce. While on his 3-day stay Dr. Peace met with graduate students, presented at the Stockbridge School of Agriculture Seminar Series as well as Franklin County Cider Days events. Dr. Peace brought his expertise in marker assisted rosaceous plant breeding and apple genome tracking to multiple communities in UMass and Franklin county, not only increasing understanding of and access to this information but also providing an opportunity for Extension to strengthen relationships within the University as well as the larger local community. Garofalo represented UMass Extension at the Cooperative Agricultural Pest Survey (CAPS) committee meeting, a collaboration of USDA APHIS PPQ, MDAR, UMass Extension and non-governmental organizations with a stake in the state's agricultural resources. CAPS meets in order to decide which invasive pests will be the focus of the next year's survey and outreach efforts.

Garofalo sits as program co-chair for the New England Vegetable and Fruit Conference helping develop sessions and coordinating scheduling and other programmatic logistical concerns.

Ghantous worked with vegetable and cranberry growers to improve their weed ID skills. She provides diagnostic services for weed ID for cranberry and vegetable growers. She and Sylvia are part of a subcommittee on Maximum Residue Limits (MRL) that involves 4 conference calls/year, 100 emails and review of pesticide options for growers.

Higgins and Scheufele attended a workshop at UVM Extension on Nutrient Management in Vegetable Crops workshop. February 12, 2020.

Higgins attended, "Making it Happen, a farm financial planning workshop" hosted by The Carrot Project.

Higgins attended "UConn Extension Agricultural Wellness Summit." December 5, 2019.

Higgins attended the "Northeast Specialty Crop Water Symposium," December 18, 2019.

Morzuch initiated the training of students to interview growers in the Mentor Program who could provide detailed information on amounts of time needed to accomplish tasks for various activities. Interviewing was to take place over the duration of the summer. The goal was to establish a template that extension members could use in future dealings with their clientele to gather economic information. Interviewing was curtailed completely as summer began and growers became busy.

Piñero conducted on-farm demonstrations of the effectiveness of odor-baited trap trees as an attract-and-kill strategy for management of plum curculio, a key pest of apple in eastern North America. This behaviorally-based approach to management of adult plum curculios was integrated with entomopathogenic nematodes (EPN) for biological control of plum curculio larvae in the soil. Evaluations took place in six commercial orchards (five in MA, one in NH) from May to August 2018. Piñero and Garofalo monitored deployment of pheromone-baited ghost traps for increased fruit damage potential due to the invasive Brown Marmorated Stink Bug at three commercial farms (August-October 2019).

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Sandler was Chair of the NEERA 1604 group and organized a meeting of IPM coordinators by zoom (due to covid 19). The meeting was held May 12, 2020 and attended by 18 people including members of the NEIPM Center. As incoming Chair, she also represented Northeast IPM Coordinators at the National IPM Coordinators meeting held in Washington, DC on October 22-23, 2019.

Sandler presented and attended the North American Cranberry Researchers and Extension Workers Conference, held in Vancouver, BC, August 18-21, 2019. Sandler presented research results on weed IPM at the Northeastern Plant, Pest, and Soil Conference held in Philadelphia, PA on January 6-9, 2020. Sandler attended the Eastern NY Grower Expo, Albany, NY on February 25-26, 2020.

Scheufele and Higgins hosted Pest Alerts call: A group of ~30 Extension agents around the Northeast convene Wednesdays during the growing season (May-Sept) for one hour discussion of the week's pest activity and other issues.

Scheufele attended the 2020 American Phytopathological Society Northeast Division Meeting March 11-13 to share plant disease updates and research activities with peers across the region.

Schloemann and Sandler participate regularly in Regional IPM "call-ins", which help to strengthen our Extension network and re-focus our educational efforts as needed. Occasionally experts join the call to share on a pest of interest (e.g., spotted lantern fly, SWD). We started having these sessions on Zoom, which allows us to share photos and slide presentations. Sylvia worked with MDAR and UMass pesticide program to host WPS train-the-trainer sessions. Sylvia trained growers on WPS and respirator fit tests. She tutored 13 growers to help them study for their pesticide certification exam. Sylvia provides diagnostic services, usually in the range of 70-100 samples per year.

How have the results been disseminated to communities of interest?

We have positive and consistent contact with our stakeholders throughout the year. As listed in Box 1, we delivered an extensive array of workshops, presentations, and training sessions throughout the reporting period. We published 7 newsletters (>100 issues total) that reached more than 4,400 specialty crop growers. We participate in Regional IPM "call-ins" and working groups, which help to strengthen our Extension network and re-focus our educational efforts as needed. We bring unknown crop damage issues to the table for discussion and the knowledge we gain is transferred directly to our growers. Almost all of the EIP Team members are part of the organizing committee for the New England Vegetable and Fruit Conference, a bi-yearly event that attracts more than 1,500 growers from across New England. This 3.5 day event offers multiple opportunities for Extension personnel and growers to share experiences and information on specialty crop production. We are invited speakers (by our Extension colleagues) throughout the Northeast to present and train specialty crop growers. We are well networked with our colleagues and this facilitates exchange of information that helps our grower community.

What do you plan to do during the next reporting period to accomplish the goals?

Goal 1: Improve IPM Practices and Strategies for Emerging and Established Pests

Emerging Pests that Affect Multiple Specialty Crops.

- We will continue to monitor emerging pests and will provide training to growers on invasive pest identification, monitoring, and management.
- We will continue in an augmented mapping information distribution network through cooperation with iPiPE, now AgPest/EddMaps.

- We will monitor scale and Japanese knotweed populations on cranberry farms and provide management information via newsletters and IPM alerts.

Advanced Apple IPM.

- The transition of growers handling their own fireblight risk management will be monitored.
- We will monitor accuracy of apple scab ascospore maturity models used in DSS at 1 MA site.
- A multi-stage IPM program for conventional and organic systems will be supported.
- Compare performance of attract-and-kill strategy involving perimeter-row sprays of insecticide mixed with sugar vs. perimeter trapping using odor-baited spheres in absence of insecticide sprays.
- Presentations will be made to growers at state and regional meetings and through UMass Extension publications.

Advanced Vegetable IPM.

- We will work with growers and regional partners to design and conduct trials on management of striped cucumber beetle (as a vector).
- We will use results from research for newsletter articles, web-based fact sheets, and workshops.

Efficacy of Organic Pesticides.

- We will conduct at least 1 study on organic pesticide efficacy. Results will be shared through field days, newsletter articles web-based factsheets, and peer-reviewed articles.
- Training of 1-2 undergraduate students on organic pest management will be provided, focusing on monitoring and organic management of key fruit and vegetable pests.

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- Integration of biological controls and cultural controls will continue.

Goal 2A: Increase IPM Implementation and Promote Whole-Farm Sustainability through Outreach and Training Activities

Training scouts and IPM implementation on Mentor Farms.

- We will regularly visit 10 Mentor Farms to scout, assess problems, and provide hands-on training for IPM techniques and pest identification. Invasive pests will be monitored.
- We will interview all Mentor Farmers at the end of the season to determine implementation success and challenges. We will seek new Mentor Farmers, if necessary, in Spring 2021.

Provide timely and accurate specialty crop disease diagnostics.

- We will produce 1 video or podcast on pest sample collection and interpreting diagnostic reports.
- Diagnostic outreach activities will focus on hands-on activities to properly identify and manage plant disease, insect, nutritional, and weed problems during field days.
- We will share this information through disease alerts, articles for vegetable, fruit and horticulture newsletters, and fruit and vegetable websites.

Conduct Workshops and Training.

- Workshops and trainings (targeting beginning and/or organic growers, WPS, nutrient management, bee conservation and weed management training, with other subjects addressed as dictated by grower needs) are a mainstay of our education outreach efforts and will continue for 2020-21.

Bridge Language Barriers.

- We will continue to develop language resources such as factsheets, vocabulary and phrase guides to be posted on our Spanish language resources webpage.
- 5 IPM videos will be translated into Spanish (and other languages) and shared via YouTube.

Promote Commonwealth Quality Program (CQP).

- Our Vegetable and Fruit Teams will continue to train inspectors/auditors to use the IPM checklists.

Goal 2B: Increase IPM Implementation and Promote Whole-Farm Sustainability through Demonstrating Effective Technological Strategies

Digital Recordkeeping.

- Team members will test new platforms (e.g., FarmDog) and collaborate with AgPst/EddMaps to investigate potential for and develop record keeping capabilities in this platform.

Optimizing Technology Utilization on Specialty Crop Farms.

- We will use UAS and image sensing with growers via workshops, meetings, and data collection.
- We will conduct research and outreach regarding dual-use of solar energy on working specialty crop farms (blueberry and cranberry) and evaluate projects fostering dual-use on specialty crop farms.
- We will research regulatory information related to agricultural water use.
- Evaluate different moisture sensor technologies in vegetables and fruit.
- Continue use of DTN© Smart Traps to allow remote monitoring of OFM, CM, and (OFM).
- Feedback will be considered on a re-tooled design for NEWA, including responsive web options.
- Team will continue to use multi-media resources (podcasts, websites, virtual conferences, social media platforms, etc.) to effectively communicate and prioritize measures in a highly adaptive fashion.

Using Integrated Pest Information Platform for Extension and Education (iPiPE).

- Utilizing AgPest/EddMaps (formerly known as iPiPe), seven BMSB monitoring sites will be established in MA and the information will be recorded and mapped.

Weather Stations and Sensors.

- We will monitor 31 weather stations and coordinate a network of 26 RainWise and Onset stations.
- We will conduct outreach about DSS and encourage use of expanded HELP features on NEWA.
- We will continue to test the efficacy of disease-risk forecasting models for management of fireblight and disease-risk forecasting models for management of summer disease complexes.
- We will produce 1 video on reading NEWA and forecast models.

Goal 3: Promote IPM Adoption by Improving and Expanding Skill Capacity and Evaluating Progress

Business Management and IPM Decision Making.

- We will work with resource economists to conduct cost-benefit analyses of replicated trials on crop and pest management, in order to provide benchmark data for growers and to gain additional expertise in making these calculations and using economic data in decision-making.

Weed Management.

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- We will screen herbicides (field trials) to identify products for priority IR-4 projects.
- We will conduct at least 1 workshop to promote use of effective weed IPM techniques; weed IPM support will be provided via field walks, newsletter articles, pest alerts, fact sheets and workshops.
- We will interview growers to assess specific needs of vegetable farms to determine the frequency and intensity of problematic annual and perennial weeds.

Information Technology (IT) Professional Development.

- We will partner with UMass Extension's Landscape, Nursery, and Urban Forestry Program to offer 7 webinars focusing on impact, monitoring, and management of invasive insects in MA. Topics include spotted lanternfly, SWD, BMSB, emerald ash borer, gypsy moth, Asian longhorned beetle, and more.
- Create and implement podcasts that are written, recorded, edited, and produced remotely by Fruit Team to expand growers' access to Healthy Fruit news while they are in the field, etc.
- We will expand our knowledge, use and development of web-based applications for remote teaching through the use of podcasts and programs like Zoom, GoToWebinar, Facebook Live, and more.

Assessing Change in Behavior and Condition from IPM Extension Efforts.

- We will use the IPM Toolkit as a guide to improve our evaluation process.
- We will work with the NEIPM Center to evaluate adoption of IPM in our Mentor program.
- We will develop a survey instrument and gather information from former Mentor farmers regarding the impact of the UMass EIP project on their pest management practices.

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	1.4	0	0	0	1.4
Professional	5.5	0	0	0	5.5
Technical	0.9	0	0	0	0.9
Administrative	0.8	0	0	0	0.8
Other	0	1	0	0	1
Computed Total	8.6	1	0	0	9.6

Student Count by Classification of Instructional Programs (CIP) Code

Undergraduate	Graduate	Post-Doctorate	CIP Code
3	0	0	01.11 Plant Sciences.

Target Audience

Specialty crop growers, conventional and organic growers, Spanish and English speaking farm workers, beginning and women farmers, Commonwealth Quality growers, UMass Extension staff, Regional Extension IPM specialists, IPM consultants and scouts, agricultural service providers, farm managers and decision makers, newsletter subscribers, workshop and meeting attendees, industry representatives including UAS (drone) pilots and trainees.

Products

Type	Status	Year Published	NIFA Support Acknowledged
Journal Articles	Published	2019	NO

Citation

Scheufele, S.B., and G. Higgins., 2019. Evaluation of fungicides to reduce chlorothalonil use for powdery mildew on squash, 2018. Plant Disease Management Reports. No. 13:V081.
<https://www.plantmanagementnetwork.org/pub/trial/pdmr/volume13/abstracts/v081.asp>

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Journal Articles	Published	2019	NO

Citation

Scheufele, S.B., and G. Higgins., 2019. Evaluation of resistant cultivars for management of downy and powdery mildews in fall cucumbers, 2018. . Plant Disease Management Reports. No. 13:V078
<https://www.plantmanagementnetwork.org/pub/trial/pdmr/volume13/abstracts/v078.asp>

Other Products**Product Type**

Other

Description

Scheufele, S. B. Vegetable IPM Research. MA Food Policy Tour, UMass Research Farm, South Deerfield, MA. August 2, 2019. 8 attendees

Product Type

Other

Description

Scheufele, S.B. Vegetable Research at the UMass Farm. UMass Research Farm, South Deerfield, MA. August 8, 2019. 10 attendees

Product Type

Other

Description

Scheufele, S. B. Understanding and Managing Diseases in Vegetable Crops. Northeast Organic Farming Association Summer Conference, Amherst, MA. August 11, 2019. 10 attendees

Product Type

Other

Description

Scheufele, S.B. Managing cucurbit downy mildew in fall cucumbers and Managing brassica insect pests using mulches, nematodes, and insectary plantings. UMass Extension Agricultural Field Day 2019, South Deerfield, MA. August 19, 2019. (2 talks presented.)

Product Type

Other

Description

Scheufele, S.B. Vegetable Scouting on the Hampshire College Farm. Northeast Organic Farming Association Summer Conference, Amherst, MA. August 20, 2019. 30 attendees

Product Type

Other

Description

Higgins, G. Vegetable Research at the UMass Farm. UMass Research Farm, South Deerfield, MA. August 31, 2019. 30 attendees

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Product Type

Other

Description

Scheufele, S.B. Updates from the Brassica Pest Collaborative. New England Fruit & Vegetable Conference, Manchester, NH. December 12, 2019. 80 attendees

Product Type

Other

Description

Higgins, G. Spinach Downy Mildew Research at UMass. New England Fruit & Vegetable Conference, Manchester, NH. December 12, 2019. 50 attendees

Product Type

Other

Description

Scheufele, S.B. Vegetable Diseases of 2019. SEMAP Ag & Food Conference, Dighton, MA. February 23, 2020. 5 attendees

Product Type

Other

Description

Scheufele, S.B. Winter Greens Pests & Diseases. New England Vegetable & Berry Growers' Association Winter Growers' Meeting, Hadley, MA. January 3, 2020. 80 attendees

Product Type

Audio or Video

Description

Scheufele, S.B. April 22, 2020. Early-Season Pest Scouting. 29 live attendees, 73 views.
<https://www.youtube.com/watch?v=pWg2BvTBis>

Product Type

Audio or Video

Description

Scheufele, S.B. May 5, 2020. Organic Pest Management. 20 live attendees, 24 views.
<https://www.youtube.com/watch?v=Xkn3992yDag>

Product Type

Other

Description

Veg Notes (28 issues, 31:8-32:10) , 2865 subscribers

Product Type

Other

Description

Higgins, Genevieve. 2020. Calculating Fertilizer Applications. Vegetable Notes 32:8.

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Product Type

Other

Description

Higgins, Genevieve. 2020. Take-Homes from March 2020 Nutrient Management Workshops. Vegetable Notes 32:4.

Product Type

Other

Description

Sandler, Sylvia, Ghantous, Averill, Uppala, Jeranyama, and Mupambi made cranberry IPM presentations at the annual UMass Cranberry Research and Extension Update held Jan. 20, 2020. 10 talks were given to 164 attendees.

Product Type

Other

Description

Cranberry Station Newsletter, Vol. 20-21 (7 issues) to 187 subscribers.

Product Type

Other

Description

The Annual Cranberry Summit was held on November 26, 2019 with 39 attendees.

Product Type

Other

Description

Industry Zoom meetings in 2020: Sylvia presented to 38 growers on April 21; Sandler and Uppala presented to 40 growers on April 27; Sandler presented to 22 growers on May 14.

Product Type

Other

Description

UMass Cranberry Extension zoom meetings: Sylvia, Ghantous and Sandler presented on April 16 to 32 growers, on May 6 to 28 growers, and on May 20 to 32 growers.

Product Type

Other

Description

Sandler, H. June 10, 2019. Presentation to Board of Public Overseers for Extension. Shrewsbury, MA 23 attendees.

Product Type

Other

Description

Cranberry Bogside Meeting, June 26, 2019. Presentations by Sylvia, Ghantous, and Sandler to 16 growers.

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Product Type

Other

Description

Sandler, H. October 17, 2019. Presentation to Wheaton College undergraduates on cranberry IPM and economic botany. 23 attendees.

Product Type

Other

Description

Ghantous, K. Managing moss in cranberry beds. January 23, 2020. Bordentown, NJ ACGA Annual meeting, 45 attendees.

Product Type

Other

Description

Cranberry Station Newsletter (Sandler, Sylvia, Ghantous, Uppala, Jeranyama, Averill), Vol. 20-21 (7 issues) to 187 subscribers. <https://ag.umass.edu/cranberry/publications/newsletters>.

Product Type

Other

Description

Berry notes (Schloemann). <https://ag.umass.edu/fruit/berry-notes-archive>. 12 issues, 440 subscribers.

Product Type

Other

Description

Grape Notes/Northern Grape Project (Schloemann). <https://ag.umass.edu/fruit/grape-notes>. 20 issues, 140 subscribers.

Product Type

Other

Description

IPM Berry Blast (Schloemann), 16 issues, 450 subscribers, <https://ag.umass.edu/fruit/ipm-berry-blast>.

Product Type

Other

Description

Healthy Fruit newsletter (Clements, Pinero, and Garofalo). Vol. 28-29 (20 issues), 100 subscribers.

Product Type

Other

Description

Fruit Notes (Autio, Cooley, and Clements). 4 issues per year, 330 subscribers. <https://ag.umass.edu/fruit/publications/fruit-notes>.

Progress Report

Accession No. 1013932

Project No. MASN00105

Product Type

Other

Description

Olanyk, C., Ware, L., Garofalo, E., and Clements, J. Growers' Perspective on Data Sharing and IPM. Fruit Notes 84(3).

Product Type

Evaluation Instruments

Description

Garofalo, E. W., Sandler, H. A., Piñero J.C., Clements, J.M. Identifying Weed Management Priorities from the Ground Up: 2019 New England Vegetable & Fruit Conference Survey Results. Fruit Notes 85 (1).

Product Type

Other

Description

Bradshaw, T., Clements, J. M., Cooley, D. R., Garofalo, E. W., Piñero, J.C., Moran, R. New England Cider Apple Project. Fruit Notes 85 (1)

Product Type

Other

Description

Clements, J. M., E. W. Garofalo. Increasing Branching of Cider Apple Trees. Fruit Notes 85 (1).

Product Type

Other

Description

Schloemann, S., Pinero, J.C., Garofalo, E. W., Ware, L.A., Cooley, D. R., Madeiras, A. New Apple IPM Fact Sheet Series. 2020.

Apple IPM - Apple Maggot

Apple IPM - Apple Scab

Apple IPM - Bitter Rot

Apple IPM - Cedar Apple Rust

Apple IPM - Codling Moth

Apple IPM - European Apple Sawfly

Apple IPM - Fire Blight (Basic)

Apple IPM - Leafhoppers

Apple IPM - Mites: European Red Mite and Two-spotted Spider Mite

Apple IPM - Obliquebanded Leafroller

Apple IPM - Oriental Fruit Moth

Apple IPM - Plum Curculio

Apple IPM - Plum Curculio Monitoring Using Lures

Apple IPM - Powdery Mildew

Apple IPM - San Jose Scale

Apple IPM - Sooty Blotch and Fly Speck

Apple IPM - Tarnished Plant Bug

<https://ag.umass.edu/fruit/fact-sheets>

United States Department of Agriculture
Progress Report

Accession No. 1013932

Project No. MASN00105

Product Type

Other

Description

Clements, J. 2020. DTN Smart Traps - Worth It or Not? Fruit Notes, Volume 85, Number 1.
<http://www.umassfruitnotes.com/v85n1/a4.pdf>

Product Type

Other

Description

Clements, J., E. Garofalo and W. Autio. 2020. 2015 Modi Organic NC-140 Apple Rootstock Trial and Drapenet Demonstration. <https://jmcextman.blogspot.com/2020/04/2015-modi-organic-nc-140-apple.html>

Product Type

Other

Description

Pinero, J., D. Cooley, J. Clements, S. Schloemann, and E. Garofalo. 2019. Massachusetts Fruit IPM Report for 2019. Fruit Notes, Volume 85, No. 1. <http://www.umassfruitnotes.com/v85n1/a1.pdf>

Product Type

Other

Description

Clements, J. and D. Olmstead. 2020. 2019 NEWA Impact Report for Massachusetts.
https://ag.umass.edu/sites/ag.umass.edu/files/pdf-doc-ppt/2019_newa_impact_report_for_massachusetts_1.pdf

Product Type

Other

Description

Clements, J. 2020. I can tell you when to spray your orchard and I don't even have to be there! NEWA, RIMpro, Ag-Radar, and Semios. Great Plains Growers Conference, January 9-11, 2020, St. Joseph, MO. 95 attendees.

Product Type

Other

Description

Clements, J. 2019. Smart Traps and the DTN Agronomic Platform. 81st Annual New England, New York, and Canada Fruit Pest Management Workshop, October 22-23, 2019, Burlington, VT. 55 people.

Product Type

Other

Description

Clements, J. 2019. DTN AP Smart Traps - Worth It or Not? 2019 Great Lakes Fruit Worker Proceedings, November 7-9, 2019, Simcoe, Ontario, Canada. 75 attendees.

Product Type

Other

Description

Clements, J. 2019. The Network for Environment and Weather Applications (NEWA) Apple Irrigation (ET) Model. Northeast Specialty Crops Water Symposium, December 18-19, 2019. Burlington, VT. 60 attendees.

United States Department of Agriculture
Progress Report

Accession No. 1013932

Project No. MASN00105

Product Type

Audio or Video

Description

Clements, J. 2020. Innovations in Orchard Monitoring Technologies. University of Maine Extension and Maine Pomological Society Preseason Tree Fruit Webinar. April 2, 2020 via Zoom.

https://maine.zoom.us/rec/play/vZ0tduD7qDw3T9PDtwSDBaNxW47vJ_2s1iMWrvCmM_u_gAXYANlemZbsUNOf_psYvD02Dc2NLnFFG3bbS?continueMode=true&_x_zm_rtaid=VRJrhNdhQ9eebr1LVPbp5g.1590780813784.1f08629384bef82c2a9183cd98cbf622&_x_zm_rhtaid=485

Product Type

Audio or Video

Description

Schnabel, G. et al. 2019-20. MyIPM App (updates). <https://play.google.com/store/apps/details?id=clemson.edu.myipm2>.
<https://apps.apple.com/us/app/myipm/id1281310029>

Product Type

Audio or Video

Description

Cavanagh, A. et. al. 2020. Eco Fruit App (updates). <https://apps.apple.com/us/app/eco-fruit-app/id1223643677>.
<https://play.google.com/store/apps/details?id=io.zigbop.ecoapple>

Product Type

Audio or Video

Description

Clements, J. 2019-20 Facebook. <https://www.facebook.com/jmcextman>

Product Type

Audio or Video

Description

Clements, J. 2019-20. Twitter. <https://twitter.com/jmcextman>

Product Type

Other

Description

Clements, J. 2019-20. jmcextman, Out and about in the UMass Cold Spring Orchard. <https://jmcextman.blogspot.com/>

Product Type

Other

Description

Clements, J. et. al. 2020. New England Tree Fruit Management Guide (updates). <https://netreefruit.org/>

Product Type

Other

Description

Clements, J. et. al. 2019-20. UMass Extension Fruit Program (updates). <https://ag.umass.edu/fruit>

Progress Report

Accession No. 1013932

Project No. MASN00105

Product Type

Other

Description

Sandler, H.A. and K.M. Ghantous. August 2019. Dodder: Biology and management. Fact sheet.
https://scholarworks.umass.edu/cranberry_facsheets/43.

Product Type

Survey Instruments

Description

Sandler, H.A. and K.M. Ghantous. August 2019. Dodder management survey January 2019.
https://scholarworks.umass.edu/cranberry_research_repts/24.

Product Type

Other

Description

cranberry. https://scholarworks.umass.edu/cranberry_facsheets/44.
Sandler, H.A. and K.M. Ghantous. August 2019. Dodder: Biology and management. Fact sheet.

Product Type

Other

Description

Ghantous, K.M., M. Sylvia, L. Uppala, and H.A. Sandler, 2020. Update to the 2018-2020 Cranberry Chart Book, May 2019.
<https://scholarworks.umass.edu/cranchart/274>.

Product Type

Other

Description

Sandler, H.A., G. Mupambi, and P. Jeranyama. 2019. Expectations for cranberry growth and productivity under solar (photovoltaic) panels. https://scholarworks.umass.edu/cranberry_facsheets/41.

Changes/Problems

Many of our usual face-to-face meetings were replaced by virtual teleconferencing platforms due to the Covid-19 pandemic. The grower response to these on-line offerings has been very positive. We remain committed to increasing our skill level for delivery our outreach materials on a virtual plane. In 2020-21, we look forward to the addition of two members of our group. The return of Lisa McKeag, who brings expertise in food safety and water quantity/quality efficiency as well as the anticipated addition of a new team member who brings UAV expertise and education enthusiasm to our program. Susan Scheufele has taken on the leadership role for the Vegetable Team and Genevieve Higgins has moved from a seasonal position to assume a larger year-round participatory role in the Vegetable Team. Elizabeth Garofalo has assumed greater responsibility for obtaining and disseminating data for the Fruit Tree team. Sonia Schloemann, who has provided small fruit expertise for UMass and the EIP project will be retiring in August 2020 and will depart from her roles related to the project.