Extension IPM for Fruit Growers FY23

Status: NIFA REVIEW

Project Director
Jaime Pinero-Ramirez

Organization Project Number

Accession Number
7002069

Start & End Date
10/01/2020

Organization
University of Massachusetts

To Project / Program
"Extension Integrated Pest Management for Fruit Growers"

Primary Critical Issue
Sustainable Agriculture and Food Systems

Fiscal Year
2023

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

In Massachusetts, there is a high need to bring research-based information on all aspects of fruit production to the state's citizens. For instance, over the past few growing seasons erratic weather has made thinning (the process of removing excess flowers and fruits from trees) challenging. Fruit growers face tough choices about protecting crops from native and invasive insect pests. In recent surveys, growers rated pests as the most significant challenge.

During FY2023, applied research, on-farm demonstrations, and Extension activities centered on the concept of ECOstacking. ECOstacking is the assembling of ecosystem services to achieve functional biodiversity. The PD Pinero is conducting a long-term study aimed at manipulating insect pest behavior through host plant preference by increasing plant diversity at the local scale in support of sustainable agriculture.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

During FY2023, Dr. Pinero conducted 11 different on-farm research and demonstration projects. The projects conducted addressed research needs such as innovative trap-tree and 'ghost trapping' methods for controlling native and invasive fruit pests, and enhancing biological control on farms.

Both farmers and consumers benefit from IPM implementation by (a) improving crop yield and quality with less pesticide residues, (b) reducing potential human health risks from pests and related pest management practices, and (c) minimizing adverse environmental effects from pests and excessive pesticide use.

Grower statement: "*I'm thrilled by the advances of UMass researchers. They have developed innovative efforts to test and integrate more affordable, available, and durable attractants for curculio and maggot (grafting, wintergreen oil, etc.). Such work promises further real improvement to the ecology of commercial orchards, in New England and around the country*".

Briefly describe how your target audience benefited from your project's activities.

The primary target audience for this project is represented by hundreds of small- and mid-scale fruit farmers located in Massachusetts and neighboring states. This project is generating research-based information that will help fruit growers, including under-represented, low-income farmers, and beginning farmers, to improve management of important insect pests that threaten fruit production. Short-and mid-term outcomes derived from our Extension IPM programming were documented.

Briefly describe how the broader public benefited from your project's activities.

The goal of reducing pesticide use can be accomplished with IPM. A long-team study, currently in year three of seven, is supported by growers and Extension, and marries Extension to research in a way that rings true to the foundational beginnings of Cooperative Extension and our

mission. Through collaborative efforts with grower associations, researchers, Extension specialists and our host farms, we can most effectively deliver our programming. Currently, thirty acres of orchard have been placed under this practice across fourteen orchard sites between Massachusetts, New Hampshire, and Maine.

In 2023, one workshop was organized by Mr. Jeremy Delisle (University of New Hampshire) in partnership with UMass. We supported expert commercial grafters from Virginia to come and teach commercial growers how to best implement a variety of grafting techniques on their farms. We worked with Steve Wood (Poverty Lane Orchards) to solidify plans to get the growers to New Hampshire. All this collaboration between Extension, a well-known NH apple grower and professional grafters was strategically done to market the program itself, but also the practice of grafting. There is a perception amongst growers, based on my communications, that grafting is a skill that any good grower should know. It is apparent that this practice is not one that growers do often enough to gain high levels of skill in. We wanted to create a draw by bringing in professional grafters from a far-away state to put the focus on them, allowing our local growers to come relearn this essential skill without feeling embarrassed that they should already be proficient in grafting.

Through our on-farm demonstrations and applied research and Extension projects, our ECOstacking message is reaching out to the broader public. Customers, students, and the general public are learning that on-farm biodiversity is key to sustainable agriculture.

Comments (optional)

Peer-reviewed publications:

Chen, M., Tang, H., Zhou, Y., Zuo, J., Wang, Y., Piñero, J.C. and Peng, X. 2023. Voltage-gated sodium channel gene mutation and P450 gene expressions are associated with the resistance of *Aphis citricola* (Hemiptera: Aphididae) to lambda-cyhalothrin. Bulletin of Entomological Research (accepted).

Giri, A.P., Short, B.D., and Piñero, J.C. 2023. Male and female tortricid moth response to non-pheromonal semiochemicals. Insects. 14(11):884. https://doi.org/10.3390/insects14110884.

Extension publications:

Piñero, J., J. Clements, D. Greene, and D. Cooley. Massachusetts Fruit IPM Report for 2022. Fruit Notes, Volume 87, Fall, 2022.

Piñero, J.C., Akotsen-Mensah, C., Giri, A., Godoy-Hernández, H., Rull-Garza, M., and Delisle, J. 2022 Sunflower and buckwheat enhance the performance of an attract-and-kill system for the brown marmorated stink bug. Fruit Notes 87(4): 16-20.

Piñero, J.C., Clements, J., Greene, D., and Cooley, D. 2022. Massachusetts Fruit IPM Report for 2022. Fruit Notes 87(4): 1-7.

Giri, A. and Piñero, J.C. 2022. Response of Oriental fruit moth to benzaldehyde and other plant volatile compounds. Fruit Notes 87(3): 1-3.

Simisky, T., Piñero, J.C., Barnes, E., Forman Orth, J., and LaScola-Miner, T. 2022. Spotted lanternfly management. University of Massachusetts Extension Landscape, Nursery and Urban Forestry Program. Fact Sheet .

Kassoy, J. and Piñero, J.C. 2022. Stink bugs. IPM Fact Sheet Series, University of Massachusetts Extension, Fact Sheet # IPM-002.

Kassoy, J., Garofalo, E., and Piñero, J.C. 2022. What are Entomopathogenic Nematodes? IPM Fact Sheet Series, University of Massachusetts Extension, Fact Sheet # IPM-001.