

Project Title: Sustainable Fruit Production and Marketing **Website:** <http://ag.umass.edu/fruit>

Project Leader: Sonia Schloemann, umassfruit@umass.edu

Team Members: Wesley Autio, Jon Clements, Daniel Cooley, James Cronk, Elizabeth Garofalo, Duane Greene, Kristen Hanley, James Krupa, Shawn McIntire, Elsa Petit, Jaime Pinero

Project Overview

Fruit farms and vineyards provide open space and scenic vistas that add significantly to the quality of life in Massachusetts. The lands surrounding agricultural production provide buffer zones for native species of plants and animals and corridors for their movement or expansion. To remain a vital part of the Massachusetts economy, both new and established growers must learn to produce crops sustainably and to adapt production systems to market opportunities. New varieties provide fruit farmers with opportunities for enhancing



Activity	Occurrence	Number of People Reached*
Classes & Tours	29	593
Diagnostics & Consultations	--	1,386
Publications	272	3,243
Research & Demonstration Projects	28	3,635
Workshops, Conferences, Presentations	52	4,820

* In-person contacts

production, quality, sales and consumption. UMass Extension provides farmers with access to current research information on new and alternative species and varieties, advanced horticultural management techniques, marketing and business management strategies, pest-ecology, and pest-management procedures. Research on pest ecology and management informs approaches that optimize control, reduce chemical use and increase fruit quality. The knowledge and resources provided by Extension forge successful partnerships with Massachusetts's fruit producers that in turn foster a more secure, diverse and healthful food supply for the Commonwealth.

- The fruit team hosted, organized and presented research based information at 52 events across New England and the Northeast. At these events, we shared vital information ranging invasive insect pest management to time sensitive horticultural guidance to climate mitigation strategies and integration of cutting edge agricultural technologies.
- We conducted 28 different on-farm research and demonstration projects. The fruit team's projects addressed research needs such as precision apple thinning trials, apple rootstock performance evaluations, cold hardy grape cultivar evaluations, novel blackberry trellising systems and pollinator habitat conservation and many more.

- Fruit team members produced and maintained 272 publications. Those publications include newsletters and production guides, fact sheets, reports, abstracts and articles (both in refereed journals and in industry publications). An archived library of works by multiple team members continues to provide reference material to growers, service providers, gardeners, students, and educators in the field. Additionally, team members also served on numerous editorial and review boards.
- Over 1,300 individual consultations and/or diagnostic services were performed providing fruit growers with information essential to their success in changing climate and growing conditions. The phone calls, site-visits, and email correspondence permitted fruit growers to employ up-to-date protocols and preemptive strategies on their farm.
- Social media significantly widened the team's audience. The UMass Fruit Team website (UMass Fruit Advisor), when linked together with social media platforms (twitter, Facebook, Instagram), extended the team's collective impact by making it available to over 10,000 people who may not have been able to attend workshops or other programs. This, along with all other high quality output, is a vital part of sustainability and the production of safe, affordable fruit.



Selected Grants Awarded (primary or as sub-award):

Autio W. R., Marini R, Cline J, Robinson T, Reighard G, Lang G, Einhort T , *NC-140 Treefruit Research*, 4/1/2018 - 3/31/2019, \$10,000

Clements, J. M., *iPipe Northeast Apple Crop Pest Program Coordination*, 10/1/17 – 9/30/18. \$38,872

Clements, J. M., D. R. Cooley, *NutriBP017 Evaluation for Management of Fire Blight and Scab on Apples, and Foliar Applications of ZincMax, CalciMac, BoronMax, and TruPhos Magnesium to Improve Fuji and Honeycrisp Apple Nutrient Levels and Fruit Quality at Harvest*. 4/1/18 – 11/1/18. \$ 8,000

Cooley, D. R., *Evaluation of the Efficacy of Organic Materials in*

Controlling Fire Blight in New England. 3/1/2017 – 2/28/18. \$19,997

Greene, D. W., *Fruit Research 2* \$9,000

Petit, E., S.G. Schloemann *Evaluation of Wine Juice Quality Following Various Shoot and Cluster Thinning Regimes*, UMass Center for Ag, Food and Env Summer Scholars Program. \$5,000

Piñero, J.C., Leskey, T.C., Shapiro, -Ilan, D., Faubert, H., Concklin, M, and Hamilton, G., *Developing a multi life-stage management strategy for apple maggot, a persistent tree fruit pest in the Northeast, through the integration of attract-and-kill and biological control*. NIFA Crop Protection and Pest Management program. 9/1/18 – 8/31/2021). \$324,854

Piñero, J.C., Schloemann, S. G., Simisky, T., Garofalo, E. W., and Clements, J. M., *Invasive Insect Pests Threatening Specialty Crops in Massachusetts: Research, Monitoring, Stakeholder Engagement and Education*. MA Department of Agricultural Resources 9/1/18 – 8/31/2020) \$40,700

H. Sandler, PD, K. Campbell-Nelson, and J. Clements, *Supporting IPM on Massachusetts Specialty Crop Farms through the Integration of Applied Research and Extension Outreach*. USDA-NIFA, Extension Implementation Program. 9/1/17 – 8/31/2020. \$867,007

Selected Publications:

- Autio, W. R.**, T Robinson, S Blatt, D Cochran, W Cowgill, C Hampson, E Hoover, G Lang, R Parra Quezada, and M Stasiak. 2017. *2016 progress report -- Budagovsky, Geneva, Pillnitz, and Malling apple rootstocks affect Honeycrisp performance over the first six years of the 2010 NC-140 Honeycrisp Apple Rootstock Trial*. Compact Fruit Tree 50(2):23-27.
- Clements, J. M.** and **W. R. Autio**. 2018. *Tree Size and Fruit Yield in 2017 of Honeycrisp and Fuji Apple Trees in 2014 NC0140 Rootstock Trials in Massachusetts and New Jersey*. Fruit Notes 84(1) 20-25.
- Clements, J. M.**, 2018. *Fifteen Years of Peach and Nectarine Variety Evaluations at the UMass Cold Spring Orchard*. Fruit Notes 84(1) 4-6.
- Clements, J. M.**, **W. R. Autio**, M Muehlbauer, and W Cowgill. 2018. *Tree size and fruit yield in 2017 of Honeycrisp and Fuji apple trees in the 2014 NC-140 Rootstock Trials in Massachusetts and New Jersey*. Fruit Notes 83(1):20-25; Horticultural News 98(1): 20-25.
- Cooley, D. R.**, **J. M. Clements**, **E. W. Garofalo**, **S. G. Schloemann** and **A. F. Tuttle**. *University of Massachusetts Fruit IPM Report for 2017*. Fruit Notes 83 (3) 8-13.
- Greene, D. W.** and **J. Krupa**. 2018. *Evaluation of the Use of Two Full Rates of ReTain on Preharvest Drop and Fruit Quality of Honeycrisp at Harvest and Following a Period of Cold Storage, 2017*. Fruit Notes 84(3) 1-6.
- Greene, D. W.**, 2018. *Fruit Thinning Guided By Physiological Principals*. Acta Horticulturae 1177:41-50.
- Piñero, J.C.** 2018. *A comparative assessment of the response of two species of cucumber beetles (Coleoptera: Chrysomelidae) to visual and olfactory cues and prospects for mass trapping*. Journal of Economic Entomology 111: 1439–1445. toy094, <https://doi.org/10.1093/jee/toy094>.
- Piñero, J.C.** and Keay, J. 2018. *Farming Practices, Knowledge, and Use of Integrated Pest Management by Commercial Fruit and Vegetable Growers in Missouri*, Journal of Integrated Pest Management, 9:1 <https://doi.org/10.1093/jipm/pmy011>. Available at: <https://goo.gl/UD9z91>.
- Piñero, J.C.**, Paul, K., Byers, P.L., Schutter, J., Becker, A., Kelly, K., and Downing, D. 2018. *Building IPM capacity in Missouri through train-the-trainer workshops and effective partnerships*. Journal of Integrated Pest Management 9: 1 <https://doi.org/10.1093/jipm/pmy013>.
- Sandler, H.A.** 2017. *Repeated applications of mesotrione and napropamide on new cranberry plantings*. Weed Technology 31:599-608.
- Sandler, H.A.** and K. Ghantous. 2018-2020 Chart Book: Weed Management. Eds. Ghantous, Sylvia, and Gauvin. <https://scholarworks.umass.edu/cranchart/262>.

Selected Additional Collaborations and Working Groups:

- European Apple Disease Working Group (International)
- Great Lakes Fruit Workers (Upper Midwest)
- NE-1020 Multi-state Evaluation of Winegrape Cultivars and Clones (Northeast & Midwest)
- NC-140 Regional Rootstock Project, Technical Committee (National)
- Northeast Berry Call-In (USDA Region I/Eastern Canadian Provinces)
- Northeast Plant Growth Regulator Working Group (Northeast)
- Organic IPM Working Group (Eastern US)
- Spotted Wing Drosophila Working Group (Eastern US)
- Northeast Tree Fruit IPM Working Group (Northeast)
- Network for Environment and Weather Applications (Northeast and Midwest)
- UMassAir 5-College Collaborative with UMass Transport Center (Local)



Frosty Cider apple ('Goldrush') w/ Sooty blotch and Flyspeck – E. Garofalo

Total educational contacts

	Adult Contacts
In Person	13,677
Indirect Contacts (Print, Web, etc...)	21,864

Narrative Summary and Impact

The UMass Extension Fruit Team seeks to introduce new ideas, technologies and techniques for fruit production in New England, provide timely relevant & research-based information to our audiences that is ecologically and economically sound, respond to current issues effectively and efficiently, and alert growers to high impact issues if/when they occur. We work with Fruit growers from small and large scale operations who range from beginners to experienced growers and use organic to conventional production systems to produce a variety of fruit crops ranging from apples to strawberries. Fruit Program activities are carried out statewide and also regionally around New England and are delivered via workshops, field days and trainings, conferences and meetings, individual consultations, newsletters, factsheets and pest alerts, guides and other publications. As a result of this work our track record includes: reduced pesticide use on fruit crops, increased use of biological controls and reduced-risk pesticide materials, introduction of new crops and production systems such as growing seedless table grapes and the introduction of high density apple production systems.

Collaborating Organizations:

- **US Department of Agriculture**
- **Massachusetts Department of Agricultural Resources**
- **Massachusetts Fruit Growers' Association**
- **New England Vegetable & Berry Growers Association**
- **Massachusetts Farm Winery & Growers Association**
- **Massachusetts Cultivated Blueberry Growers Association**
- **Massachusetts Horticultural Society**
- **Massachusetts Master Gardeners Association**