

Fruit Team FY2018

Team Members (directly reporting outputs):

Professional Staff

Sonia Schloemann, (SGS) MS, Extension Educator, Small Fruit and Viticulture, Fruit Team Leader, Interim Ag Prog. Dir.

Jon Clements, (JMC) MS, Extension Educator, Tree Fruit, Integrated Orchard Management

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Faculty

Wesley Autio, (WRA) PhD., Pomology, Professor and Director Stockbridge School of Agriculture

Duane Greene, (DWG) PhD., Pomology, Professor Stockbridge School of Agriculture, Director of UMass Cold Spring Orchard Research & Education Center

Daniel Cooley, (DRC) PhD., Fruit Tree Pathology, Professor Stockbridge School of Agriculture

Jaime Piñero, (JP) PhD., Fruit Entomology, Associate Professor Stockbridge School of Agriculture

Hilary Sandler, (HAS) PhD., Extension Faculty, Weed Specialist, Cranberry Specialist, State IPM Coordinator, Director UMass Cranberry Station

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Graduate Students

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UMass Cold Spring Orchard Staff

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Jacob Aliengena, (JA) Technical Assistant, UMass Cold Spring Orchard Research & Education Center

Description of Plan:

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 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.

Situation & Priorities:

- **Integrated Pest Management** - the fruit program delivers current IPM information and training via publications, newsletters, twilight meetings, educational programs, and other outputs.
- **Economically Viable Food Production** - the fruit program helps growers achieve more economically viable production practices by presenting research based information on new production practices, new crops or varieties, season extension practices, etc. via publications, newsletters, twilight meetings, educational programs, and other outputs.
- **Environmentally Sustainable Food Production** - the fruit program delivers information and training in environmentally sustainable production practices (beyond IPM), with particular attention to organic practices, via publications, newsletters, twilight meetings, educational programs, and other outputs.
- **Safe, local food** - the fruit program delivers information and training in food safety, including for Good Agricultural Practices (GAP) certification, via publications, newsletters, twilight meetings, educational programs, and other outputs.

Stakeholder Input

The UMass Fruit Team has a long and valued research and education relationship with industry partners, through the Massachusetts Fruit Growers' Association, New England Vegetable and Berry Growers Association, Massachusetts Farm Winery and Growers Association, The Massachusetts Cultivated Blueberry Growers Association and other clients and growers. Ongoing communication (via meetings, grower visits, etc.,) with these partners is a valuable feedback tool to help plan research and education programs.

Evaluation Overview

Evaluations are conducted during twilight meetings for pesticide credit. A year-end program survey is conducted to evaluate program outputs and assess impacts. In addition, we will rely on observations and communication with growers.

Program Goals

Learning Outcome: Participants develop knowledge and skills that ensure the economic viability of food production

Learning Outcome: Participants develop knowledge and skills that ensure the environmental sustainability of food production

Action Outcome: Participants adopt practices that ensure the economic viability of food production

Action Outcome: Participants adopt practices that ensure the environmental sustainability of food production

OUTPUTS:

PUBLICATIONS

GUIDES, NEWSLETTERS, FACT SHEETS	Number /Issues	Circulation/ Subscriptions
GUIDES		
2018 New England Tree Fruit Management Guide (JMC, DRC, DWG, ARB) http://netreefruit.org J. M. Clements - General Editor - updates published and posted online	1	90 hard copies Online access – 6,200 ‘Users’
2017-18 New England Small Fruit Pest Management Guide (SGS, HAS) https://ag.umass.edu/fruit/ne-small-fruit-management-guide S. G. Schloemann - General Editor - updates published and posted online	1	900 hard copies Online access – 1,600+ page-views
2018 Core Eco Protocol. v. 2.3 (DRC, JMC) https://ipminstitute.org/wp-content/uploads/2018/04/Red-Tomato-Core-Eco-Protocol-2018-v2_3-030918.pdf D. R. Cooley – Contributor and Reviewer J. M. Clements – Contributor and Reviewer	1	100
2018 Eco Apple Supplement, v. 2.6 IPM Institute of North America (DRC, JMC) https://ipminstitute.org/wp-content/uploads/2018/04/Red-Tomato-Eco-Apple-Supplement-2018-v2_6-030918.pdf D. R. Cooley – Contributor and Reviewer J. M. Clements – Contributor and Reviewer	1	100
2018 Eco-Stone Fruit Protocol. v. 2.2. IPM Institute of North America (DRC, JMC) https://ipminstitute.org/wp-content/uploads/2018/04/Red-Tomato-Eco-Stone-Fruit-Supplement-2018-v2_2-030918.pdf D. R. Cooley - Contributor and Reviewer J. M. Clements - Contributor and Reviewer	1	100
2018 Eco Apple Quick Guide, v. 10.1 IPM Institute of North America (DRC, JMC) https://ipminstitute.org/wp-content/uploads/2018/04/Eco-Apple-Quick-Guide-2018-v10_1-030918.pdf D. R. Cooley - Contributor and Reviewer J. M. Clements - Contributor and Reviewer	1	100
		TOTAL: 1,390

NEWSLETTERS, ALERTS AND QUARTERLIES produced by Fruit Team members	Number /Issues	Circulation/ Subscriptions
Berry Notes (SGS) https://ag.umass.edu/fruit/berry-notes-archive	12	446
Fruit Notes (WRA) https://ag.umass.edu/fruit/publications/fruit-notes	4	130
Grape Notes/Northern Grapes Project (SGS) https://ag.umass.edu/fruit/grape-notes	23	146
Healthy Fruit alerts (JMC) https://ag.umass.edu/fruit/healthy-fruit-archive	22	180
Healthy Fruit Newsletter (JMC) https://ag.umass.edu/fruit/publications/healthy-fruit	20	180
IPM Berry Blast (SGS) https://ag.umass.edu/fruit/ipm-berry-blast	13	446
Cranberry Station Newsletter https://ag.umass.edu/cranberry/newsletters	6	325
Total	100	1,853

ARTICLES/PAPERS
Articles in Refereed and Un-refereed Professional 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. <i>Compact Fruit Tree</i> 50(2):23-27.
Clements, J. M. and W. R. Autio . 2018. <i>Tree Size and Fruit Yield in 2017 of Honeycrisp and Fuji Apple Trees in 2014 NC0140 Rootstock Trials in Massachusetts and New Jersey</i> . <i>Fruit Notes</i> 84(1) 20-25.
Clements, J. M. , 2018. <i>Fifteen Years of Peach and Nectarine Variety Evaluations at the UMass Cold Spring Orchard</i> . <i>Fruit Notes</i> 84(1) 4-6.
Clements, J. M. , 2018. <i>International Fruit Tree Association in New Zealand</i> . <i>Fruit Notes</i> 84(2) 22-26.
Clements, J. M. , D. R. Cooley and E. W. Garofalo . 2018. <i>2017 UMass RIMpro Advisory Service</i> . <i>Fruit Notes</i> 84(1) 8-9.
Clements, J. M. , E. W. Garofalo . 2018. <i>iPiPE Northeast Apple Crop-Pest Program (CPP)</i> . <i>Fruit Notes</i> 84(1) 1-2.
Clements, J. M. , W. R. Autio , M Muehlbauer, and W Cowgill. 2018. <i>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</i> . <i>Fruit Notes</i> 83(1):20-25; <i>Horticultural News</i> 98(1): 20-25.
Cooley, D. R. , J. M. Clements , E. W. Garofalo , S. G. Schloemann and A. F. Tuttle . <i>University of Massachusetts Fruit IPM Report for 2017</i> . <i>Fruit Notes</i> 83 (3) 8-13.
Cowgill, W, M Muehlbauer, W. R. Autio , and J. M. Clements . 2017. <i>Comparison of the effects of ten Geneva rootstocks and M.9 on Modi apple trees in New Jersey</i> . <i>Horticultural News</i> 97(4):1-3.
Cowgill, W., M. Muehlbauer, W. R. Autio and J. M. Clements . 2017. <i>Comparison of the Effects of Ten Geneva Rootstocks and M.9 on Modi Apple Trees in New Jersey</i> . <i>Fruit Notes</i> Vol. 82, No. 3. pp 1-3.
Ghantous, K.M. and H.A. Sandler , 2017. <i>Evaluations of pre- and postemergence herbicides for dodder management in cranberry</i> . <i>Acta Horticulturae</i> 1180:379-386.
Ghantous, K.G., H.A. Sandler , L. McDermott, and M. Sylvia. 2018. <i>Grower surveys of resistance management concerns, knowledge and implementation</i> . https://scholarworks.umass.edu/cranberry_outreach_resistance/2 .

<p>Greene, D. W. and J. Krupa. 2018. <i>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.</i> Fruit Notes 84(3) 1-6.</p>
<p>Greene, D. W., 2018. <i>Fruit Thinning Guided By Physiological Principals.</i> Acta Horticulturae 1177:41-50.</p>
<p>Marini, RP, RM Crassweller, W. R. Autio, R Moran, TL Robinson, J Cline, D Wolfe, and R Parra-Quezada. 2017. <i>The interactive effects of early season temperatures, crop density, and rootstock average fruit weight of 'Golden Delicious' apples.</i> Acta Horticulturae 1177:189-194. https://doi.org/10.17660/ActaHortic.2017.1177.26</p>
<p>McArtney, S., D. W. Greene, and T. Schmidt. 2018. <i>Postharvest growth of the terminal (King)cflower receptacle in apple buds.</i> Acta Horticulturae 1177:177-181.</p>
<p>Piñero, J.C. 2018. <i>A comparative assessment of the response of two species of cucumber beetles (Coleoptera: Chrysomelidae) to visual and olfactory cues and prospects for mass trapping.</i> Journal of Economic Entomology 111: 1439-1445. toy094, https://doi.org/10.1093/jee/toy094.</p>
<p>Piñero, J.C. and Foley, N. 2018. <i>Evaluation of diluted grape juice as an inexpensive attractant for the invasive fruit pest spotted wing Drosophila.</i> Fruit Notes 83(3) 1-7.</p>
<p>Piñero, J.C. and Keay, J. 2018. <i>Farming Practices, Knowledge, and Use of Integrated Pest Management by Commercial Fruit and Vegetable Growers in Missouri,</i> Journal of Integrated Pest Management, 9:1 https://doi.org/10.1093/jipm/pmy011. Available at: https://goo.gl/UD9z91.</p>
<p>Piñero, J.C., Paul, K., Byers, P.L., Schutter, J., Becker, A., Kelly, K., and Downing, D. 2018. <i>Building IPM capacity in Missouri through train-the-trainer workshops and effective partnerships.</i> Journal of Integrated Pest Management 9: 1 https://doi.org/10.1093/jipm/pmy013.</p>
<p>Piñero, J.C., Shivers, T., Byers, P., and Johnson, H. 2018. <i>Insect-based compost and vermicompost production, quality and performance.</i> Renewable Agriculture and Food Systems, 1-7. https://doi.org/10.1017/S1742170518000339.</p>
<p>Reighard, GL, W Bridges, D Archbold, A Atucha, W. R. Autio, T Beckman, B Black, D Chavez, E Coneva, K Day, M Kushad, RS Johnson, T Lindstrom, J Lordan, I Minas, D Ouellette, M Parker, R Pokharel, T Robinson, J Schupp, M Warmund, and D Wolfe. 2018. <i>Rootstock performance in the 2009 NC-140 peach trial across 11 states.</i> Acta Horticulturae. in press.</p>
<p>Robinson, T., A. N. Lakso and D. W. Greene. 2018. <i>Precision crop load management: the practical implications of physiological models.</i> Acta Horticulturae 1177:381-390.</p>
<p>Sandler, H.A. 2017. <i>Repeated applications of mesotrione and napropamide on new cranberry plantings.</i> Weed Technology 31:599-608.</p>
<p>Sandler, H.A. and K. Ghantous. 2018-2020 Chart Book: Weed Management. Eds. Ghantous, Sylvia, and Gauvin. https://scholarworks.umass.edu/cranchart/262.</p>
<p>Sarkar, D., C. Ankolekar, D. W. Greene, and K. Shetty. 2018. <i>Natural preservation for superficial scald reduction and enhancement of protective phenol-linked antioxidant responses in apple during post-harvest storage.</i> Journal of Food Science and Technology 55:(5):1767-1780.</p>
<p>Shrestha, B., D. Finke, and J. C. Piñero. 2018. <i>The botanical triad: the presence of insectary plants enhances natural enemy abundance on trap crop plants in an organic cabbage agro-ecosystem.</i> Submitted to Biological Control.</p>
<p>Vargas, R.I., Miller, N.E., and Piñero, J.C. 2018. <i>Effect of physiological state on female melon fly, Bactrocera (Zeugodacus) cucurbitae (Diptera: Tephritidae), attraction to host and food odor in the field.</i> Journal of Economic Entomology 111: 1318-1322. toy092, https://doi.org/10.1093/jee/toy092.</p>
<p>Wong, K.M., M.G. Corradini, W.R. Autio, and A.J. Kinchla. 2018. <i>Sodium reduction strategies through use of meat extenders (white button mushrooms vs. textured soy) in beef patties.</i> Food Science & Nutrition, in press.</p>
<p>Zandvakili, OR, AV Barker, M Hashemi, F Etemadi, and W. R. Autio. 2018. <i>Comparisons of commercial organic and chemical fertilizer solutions on growth and composition of lettuce.</i> Journal of Plant Nutrition. in press.</p>

Zeng, Q., Z. Cui, J. Wang, K. Childs, G. Sundin, **D. R. Cooley**, C-H. Yang, **E. W. Garofalo**, A. Eaton, R. Huntley, X. Yuan, N. Schultes. (2018). *Comparative genomics of Spiraeoideae-infecting Erwinia amylovora strains provides novel insight to genetic diversity and identifies the genetic basis of a low-virulence strain*. Molecular Plant Pathology 19: 1652-1666.

Total: 31

Fact Sheets:

Autio, W. R. 2018. *The 2010 NC-140 Honeycrisp Apple Rootstock Trial*. UMass Fruit Program Factsheet, 2 pp.

Petit, E. L., 2018. *Black Rot of Grapes*. UMass Fruit Program Factsheet, 2 pp.

Articles in Newsletters or Trade Publications:

- Clements, J. M.**, *The Way I see it*. Healthy Fruit, Vol, 26. No. 1
- Clements, J. M.**, *Horticulture Update*. Healthy Fruit, Vol, 26. No. 1
- Clements, J. M.**, *The Way I see it*. Healthy Fruit, Vol, 26. No. 2
- Clements, J. M.**, *A Rogue's Gallery of Renewal Pruning Cuts*. Healthy Fruit, Vol, 26. No. 2
- Clements, J. M.**, *The Way I see it*. Healthy Fruit, Vol, 26. No. 3
- Clements, J. M.**, *Got Branching?* Healthy Fruit, Vol, 26. No. 3
- Clements, J. M.**, *Current Bud Stages*. Healthy Fruit, Vol, 26. No. 4
- Clements, J. M.**, *Pruning Newly Planted Apple Trees*. Healthy Fruit, Vol, 26. No. 4
- Clements, J. M.**, *Current Bud Stages and The Way I see it*. Healthy Fruit, Vol, 26. No. 5
- Clements, J. M.**, *Horticulture Update*. Healthy Fruit, Vol, 26. No. 5
- Clements, J. M.**, *Current Bud Stages and The Way I see it*. Healthy Fruit, Vol, 26. No. 6
- Clements, J. M.**, *Horticulture Update*. Healthy Fruit, Vol, 26. No. 6
- Clements, J. M.**, *Current Bud Stages and The Way I see it*. Healthy Fruit, Vol, 26. No. 7
- Clements, J. M.**, *Current Bud Stages and The Way I see it*. Healthy Fruit, Vol, 26. No. 8
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 9
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 10
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 11
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 12
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 13
- Clements, J. M.**, *Horticultural Update*. Healthy Fruit, Vol, 26. No. 13
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 14
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 15
- Clements, J. M.**, *Horticultural Update*. Healthy Fruit, Vol, 26. No. 15
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 17
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 19
- Clements, J. M.**, *ReTain®*, *the Rest of the Story*. Healthy Fruit, Vol, 26. No. 19
- Clements, J. M.**, *Upcoming Pest Events and The Way I see it*. Healthy Fruit, Vol, 26. No. 20
- Clements, J. M.**, *Apple Maturity Report*. Healthy Fruit, Vol, 26. No. 20
- Clements, J. M.**, *Apple Maturity Report and The Way I see it*. Healthy Fruit, Vol, 26. No. 21
- Clements, J. M.**, *Apple Maturity Report and The Way I see it*. Healthy Fruit, Vol, 26. No. 22

- Clements, J. M.**, *Apple Maturity Report and The Way I see it*. Healthy Fruit, Vol, 26. No. 23
- Cooley, D. R.**, *Disease Management Update*. Healthy Fruit, Vol, 26. No. 1
- Cooley, D. R.**, *Chillin' with Scab*. Healthy Fruit, Vol, 26. No. 2
- Cooley, D. R.**, *Still Chillin'*. Healthy Fruit, Vol, 26. No. 3
- Cooley, D. R.**, *Disease Update*. Healthy Fruit, Vol, 26. No. 4
- Cooley, D. R.**, *Not a Time to Snooze*. Healthy Fruit, Vol, 26. No. 6
- Cooley, D. R.**, *Fire Blight Risk*. Healthy Fruit, Vol, 26. No. 7
- Cooley, D. R.**, *The End of Primary Scab? The Beginning of Secondary Scab?*. Healthy Fruit, Vol, 26. No. 8
- Cooley, D. R.**, *Disease Update*. Healthy Fruit, Vol, 26. No. 9
- Cooley, D. R.**, *Disease Update*. Healthy Fruit, Vol, 26. No. 10
- Cooley, D. R.**, *Disease Update*. Healthy Fruit, Vol, 26. No. 12
- Cooley, D. R.**, *Managing Sooty Blotch/Flyspeck, SBFS*. Healthy Fruit, Vol, 26. No. 16
- Cooley, D. R.**, *Brown Rot, SBFS*. Healthy Fruit, Vol, 26. No. 17
- Cooley, D. R.**, *There's Something Rotten in Massachusetts: Apples!, SBFS*. Healthy Fruit, Vol, 26. No. 22
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 1
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 2
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 3
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 4
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 5
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 6
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 7
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 8
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 9
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 10
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 11
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 12
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 13
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 14
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 15
- Garofalo, E. W.**, *Hawkeye's Corner (notes from the field)*. Healthy Fruit, Vol, 26. No. 17
- Greene, D. W.**, *Prohexadione-calcium (Pro-Ca), Apogee & Kudos for Growth Control of Apples*. Healthy Fruit, Vol, 26. No. 5
- Greene, D. W.**, *Thinning Options.*, Healthy Fruit, Vol, 26. No. 6
- Greene, D. W.**, *Chemical Thinning Suggestions*. Healthy Fruit, Vol, 26. No. 7
- Greene, D. W.**, *Chemical Thinning Recommendations*. Healthy Fruit 26. No. 8
- Greene, D. W.**, *Chemical Thinning Suggestions the Next 7 Days*. Healthy Fruit 26. No. 9
- Greene, D. W.**, *Rescue Thinning of Apples with Ethephon*. Healthy Fruit 26. No. 10
- Greene, D. W.**, *Pre-harvest Drop Control Suggestions for Using ReTain® in 2018*. Healthy Fruit 26. No. 18
- Piñero, J.C.**, *Entomology and arthropod IPM research and Extension are back to being fully staffed at UMass!* Healthy Fruit Vol. 26:1

- Piñero, J.C.**, *A look into patterns of plum curculio immigration and research plan for the 2018 season.* Healthy Fruit Vol. 26:2
- Piñero, J.C.**, *Integration of biological control (involving insect-killing nematodes) with attract-and-kill (involving odor-baited trap trees) for sustainable plum curculio control.* Healthy Fruit Vol. 26:3
- Piñero, J.C.**, *A synopsis of spider mite biology, monitoring, and management using oils in the early growing season, with some notes on predatory mites.* Healthy Fruit Vol. 26:4
- Piñero, J.C.**, *Be part of our plum curculio on-farm demonstrations in 2018!* Healthy Fruit Vol. 26:5
- Piñero, J.C.**, *It's plum curculio showtime!* Healthy Fruit Vol. 26:6
- Piñero, J.C.**, *Effect of air temperature on plum curculio immigration: 2018 season.* Healthy Fruit Vol. 26:7
- Piñero, J.C.**, *Efficacy of non- pyrethroid insecticides applied against plum curculio and Oriental fruit moth in apple (petal fall) and peach (shuck split), with notes on environmental and health impacts..* Healthy Fruit Vol. 26:8
- Piñero, J.C.**, *Plum curculio update and peach tree borers.* Healthy Fruit Vol. 26:9
- Piñero, J.C.**, *Spotted Wing Drosophila Outlook for 2018.* Healthy Fruit Vol. 26:10
- Piñero, J.C.**, *The plum curculio season is nearly over!* Healthy Fruit Vol. 26:11
- Piñero, J.C.**, *Codling moth resistance to insecticides.* Healthy Fruit Vol. 26:12
- Piñero, J.C.**, *Spotted wing Drosophila (SWD) update with notes on insecticide efficacy and rainfastness on fruit crops.* Healthy Fruit Vol. 26:13
- Piñero, J.C.**, *Apple maggot and European cherry fruit fly.* Healthy Fruit Vol. 26:14
- Piñero, J.C.**, *Insecticides against apple maggot fly (AMF).* Healthy Fruit Vol. 26:15
- Piñero, J.C.**, *Apple maggot fly (AMF) and leafhoppers.* Healthy Fruit Vol. 26:17
- Piñero, J.C.** and **E. W. Garofalo**, *Brown Marmorated Stink Bug and Spotted Wing Drosophila Updates.* Healthy Fruit Vol. 26:19
- Piñero, J.C.**, *Spotted Wing Drosophila (SWD) research update: Grape juice diluted in water is an effective attractant for trapping SWD.* Healthy Fruit Vol. 26:20
- Piñero, J.C.**, *Pest Alert! Brown Marmorated Stink Bug on the rise.* Healthy Fruit Vol. 26:22
- Piñero, J.C.**, *Spotted Wing Drosophila (SWD) Research Update.* Massachusetts Berry Notes, Vol. 30, No. 9. pp 8-9
- Sandler, H.A.** and K. Ghantous. *Weed Control after Harvest.* Cranberry Station Newsletter. Vol. 18, No. 4, pp 2-3
- Sandler, H.A.** and staff. *Review of the 15th Cranberry Crop Summit.* Cranberry Station Newsletter. Vol. 18, No. 5, pp 1-7
- Sandler, H.A.** and K. Ghantous. *Cranberry IPM Highlights.* Cranberry Station Newsletter. Vol. 19, No. 1, pp 2-3
- Sandler, H.A.** and K. Ghantous. *Spring Weed Management.* Cranberry Station Newsletter. Vol. 19, No. 3, pp 2-4
- Sandler, H.A.** and K. Ghantous. *Notes on Roundup and IPM.* Cranberry Station Newsletter. Vol. 19, No. 4, pp 1-2
- Sandler, H.A.** and K. Ghantous. *Plant Stress and Herbicides.* Cranberry Station Newsletter. Vol. 19, No. 5, p. 1
- Schloemann, S. G.**, *Winter Mulch for Strawberries.* Massachusetts Berry Notes. Vol 29, No 11. pp 2-3
- Schloemann, S. G.**, *Winter Freeze Injury to Strawberry Crowns.* Massachusetts Berry Notes. Vol 30, No 2, pp 2-3
- Schloemann, S. G.**, *Pruning Brambles.* Massachusetts Berry Notes. Vol 30, No 2, pp 6-7
- Schloemann, S. G.**, *Pruning Blueberries.* Massachusetts Berry Notes. Vol 30, No 2, pp 7-8
- Schloemann, S. G.**, *Winter Mulch Removal in Strawberries.* Massachusetts Berry Notes. Vol 30, No 3. pp 2
- Schloemann, S. G.**, *Spring Strawberry Chores.* Massachusetts Berry Notes. Vol 30, No 4. pp 2-3

- Schloemann, S. G.**, *Spring Bramble Chores*. Massachusetts Berry Notes. Vol 30, No 4. pp 3
- Schloemann, S. G.**, *Spring Blueberry Chores*. Massachusetts Berry Notes. Vol 30, No 4. pp 3-4
- Schloemann, S. G.**, *Tarnished Plant Bug in Strawberry*. Massachusetts Berry Notes. Vol 30. No 5. pp 8-9
- Schloemann, S. G.**, *Raspberry Fruitworm*. Massachusetts Berry Notes. Vol 30. No 5. pp 11-12
- Schloemann, S. G.**, *Potato Leaf Hopper in Brambles*. Massachusetts Berry Notes. Vol 30. No 6. pp 8
- Schloemann, S. G.**, *Small Fruit Leaf Tissue Analysis.*, Massachusetts Berry Notes, Vol. 30, No. 7 pp 12
- Schloemann, S. G.**, *Strawberry Fall Check-List*, Massachusetts Berry Notes, Vol. 2930 No. 9 pp 2-3
- Schloemann, S. G.**, *Raspberry Fall Check-List*, Massachusetts Berry Notes, Vol. 30, No. 9 pp 3
- Schloemann, S. G.**, *Highbush Blueberry Fall Check-List*, Massachusetts Berry Notes, Vol. 30, No. 9 pp 3-4

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Other Papers & Reports:

Posters

- Bienvenue, A., B. Beaudry, B. Hoole, **E. Petit**. *Strategies for Canopy Management for Optimal Juice Quality*. UMass Undergraduate Research Conference. April 2018. 50 in attendance
- Davis, J., K. Sokel, **E. Petit**. *Student-Run Organic Vineyard Enterprise*. UMass Undergraduate Research Conference. April 2018. 25 in attendance
- Foley, N., and **Piñero, J.C.** 2018. *Evaluation of plant-based materials for attractiveness to the invasive spotted wing Drosophila, Drosophila suzukii*. CAFE Summer Scholar Program Posters & Presentations (12 September, 2018).
- Foley, N., **J. Clements, E. Garofalo**, and P. O'Connor. 2018. *Innovating Apple Pest Incidence Data Collection*. iPiPE Mixer, February 6-8, Raleigh, NC.
- Garofalo, E. W.** *Disease Forecast Models: When Climate Changes the Rules*. 2017 New England Vegetable & Fruit Conference. Manchester NH. December 2017. 120 in attendance.
- Garofalo, E. W.** *Disease Forecast Models: When Climate Changes the Rules.*. UMass School of Earth and Sustainability Poster Session. UMass Amherst. April 2018. 70 in attendance.
- Lyons, M., A. Bienvenue, J. Raber, C. Sullivan, **S. Schloemann, E. Petit**. 2018. *Effect of Cluster and Shoot Thinning on Fruit Quality for Emerging Grape Cultivars in the Northeast*. UMass Center for Agriculture, Food and the Environment (CAFE) Summer Scholar Program. September 2018. 50 in attendance
- Lyons, M., W. Cleary, **E. Petit**. *Cold-Climate Grape Microbiomes in Wild and Domesticated Cultivars*. UMass Undergraduate Research Conference. April 2018. 50 in attendance
- Zink, A., J. Lesnikowski, **E. Petit**. *Cold Hardiness of European American Hybrid Grape Varieties in a Changing Climate*. UMass Undergraduate Research Conference. April 2018. 50 in attendance
- Zink, A., J. Lesnikowski, **E. Petit**. *Cold Hardiness of European American Hybrid Grape Varieties in a Changing Climate*. UMass Plant Biology Seminar, May 2018.

Proceedings

- Clements, J. R.**, *15 Years of Peach and Nectarine Variety Evaluation at the UMass Orchard*. 2017 New England Vegetable & Fruit Conference Proceedings. Pp 157-160.
- Petit, E.**, A. Bienvenue, J. Raber, C. Sullivan and **S. G. Schloemann**, *Strategies for Canopy Management for Optimal Juice Quality*. New England Vegetable & Fruit Conference Proceedings. Pp 175-176.
- Sandler, H. A.**, *Grape Weed Management Update*, New England Vegetable & Fruit Conference Proceedings. Pp 182-185.

Sandler, H.A. and Ghantous, K.M. 2018. *Integrating decision making processes into cranberry weed management: Dodder as a case study*. Weed Science Society of America, Arlington, VA.
<http://wssaabstracts.com/public/xx/proceedings.html>.

Sandler, H.A., K.M. Ghantous, and L.G. McDermott. 2018. *Professional development for unifying resistance management education for Northeast specialty crops*. Proceedings of the Northeastern Plant, Pest, and Soils Conference, 3:78.

Schloemann, S. G., G. W. Hamilton, *Basic Canopy and Cluster Management During the Growing Season*. New England Vegetable & Fruit Conference Proceedings. Pp 232-235.

Technical Reports

Autio, W. R., J. M. Clements, J. Krupa, D. R. Cooley, and W. Cowgill. (2017). *Annual Report To Nc-140 From The Massachusetts Agricultural Experiment Station*. 8 pages.

Autio, W. R. (2017). *Annual Report To Nc-140 On The 2010 Apple Rootstock Trials*. 13 pages.

Autio, W. R. (2017). *Annual Report To Nc-140 On The 2015 Organic Apple Rootstock Trial*. 5 pages.

Greene, D. W. and S. Hon. *AD-21 Report on Postharvest Biology of Pome Fruit*.

Greene, D. W. *Report on the Influence of High Rates of Retain on Preharvest Drop and Fruit Quality Following a Period of Regular Air Storage*. 8pp. A report submitted to Valent Biosciences.

Greene, D. W. *Influence of Metamitron (Brevis) on Fruit Set and Fruit Quality of McIntosh Apples*. 6 pp. A report submitted to Adama Inc.

Greene, D. W. *Evaluation of Several Method to Inject Gibberellin GA7 Into McIntosh Apple Trees*. A report submitted to the Rainbow Tree Company.

Schloemann, S. G., J. M. Clements, A. F. Tuttle, K. M. Ghantous, A. M. Madeiras, W. R. Autio, D. R. Greene, D. R. Cooley, H. A. Sandler, E. Petit, E. W. Garofalo, S. McIntire, K. M. Hanley, J. Cronk, J. Krupa, J. Aliengena. 2017. *Fruit Team Report for FY2017*. 18 pages.

Textbook Chapter

Greene, D. W., *Optimizing Plant Growth, Yield and Fruit quality with Plant Bioregulators*. In: *Achieving Sustainable cultivation of Temperate Zone Tree Fruits and Berries*. (Greg Lang (Ed.))

WEBSITES, SOCIAL MEDIA AND APPS		
Title	Website	Page views (via Google analytics or comparable source)
<i>Eco Apple App (DRC, JMC)</i>	https://ag.umass.edu/fruit/news/eco-apple-app-now-available	17 app downloads
<i>MyIPM (JMC, DRC, JP)</i>	https://www.clemson.edu/extension/peach/commercial/diseases/myipmsmartphoneappseries.html	1,437 app downloads, 1,055 app updates
<i>UMass Fruit Advisor (JMC, SGS, WRA, AFT, DRC, EWG)</i>	https://ag.umass.edu/fruit	10,000
<i>New England Wine Grape Growers Resource Center (SGS, EP)</i>	http://newenglandwinegrapes.org/	5,586
<i>NC-140 Regional Rootstock Research Project (JMC, WRA)</i>	http://www.nc140.org	2,500
<i>eXtension Apples CoP (JMC)</i>	http://articles.extension.org/apples	3,500

<i>Apple-crop e-mail discussion group (JMC)</i>	https://www.mail-archive.com/apple-crop@virtualorchard.com/	300
<i>Network for Environment and Weather Applications- NEWA (JMC)</i>	http://www.newa.cornell.edu	<i>This website is not maintained by UMass but we contribute significant data to its content</i>
<i>jmcextman, out and about in the UMass Cold Spring Orchard blog (JMC)</i>	http://jmcextman.blogspot.com/	7,200
<i>Jon Clements on Facebook and Twitter (JMC)</i>	https://www.facebook.com/jmcextman https://twitter.com/jmcextman	650 followers

PRESENTATIONS

MEETINGS, WORKSHOPS & FIELD DAYS FOR COMMERCIAL GROWERS, PROFESSIONAL SERVICE PROVIDERS & INDUSTRY.				
On-Farm Meetings/Workshops <u>organized</u> by Fruit Team (in whole or part)				
Date	Meeting Title (credit)	Meeting Sponsor(s)	Locations	Attendance
4/10/18	Fruit Program Twilight Meeting - (JMC)	UMass Fruit Team	UMass Cold Spring Orchard, Belchertown, MA	38
4/11/18	Fruit Program Twilight Meeting - (JMC)	UMass Fruit Team	Carlson Orchards, Harvard, MA	63
4/12/18	Fruit Program Twilight Meeting - (JMC)	UMass Fruit Team & URI Extension	Henry J. Steere Orchards, Greenville, RI.	41
5/8/18	Fruit Program Twilight Meeting - (JMC)	UMass Fruit Team	Apex Orchard, Shelburne MA	38
5/10/18	Fruit Program Twilight Meeting - (JMC)	UMass Fruit Team	Foppema's Farm, Sutton, MA	46
6/14/18	Fruit Program Twilight Meeting - (JMC)	UMass Fruit Team & URI Extension	Barden Family Orchard, North Scituate, RI	40
7/10/18	<i>Massachusetts Fruit Growers' Assoc. Annual Summer Meeting (JMC, DWG, WRA, EWG)</i>	UMass Extension/ Mass Fruit Growers' Assoc.	UMass Cold Spring Orchard, Belchertown, MA	115
TOTAL:				381
Presentations given at on-farm meetings or workshops by Fruit Team members				
Date	Presentation Title (credit)	Meeting Sponsor(s)	Locations	Attendance
11/5/18	<i>Winter Moth management and reduced risk pesticide use in blueberries: farmer-to-farmer discussion (EWG-moderator)</i>	Massachusetts Cultivated Blueberry Growers Assoc.	Westborough, MA	20
4/10/18	<i>Addressing key arthropod pests: 2018 research plan (JP)</i>	UMass Extension Fruit Twilight Meeting	UMass Cold Spring Orchard, Belchertown, MA	38

4/10/18	<i>Changes and Updates in Apple Disease Management for 2018 (DRC)</i>	UMass Extension Fruit Twilight Meeting	UMass Cold Spring Orchard, Belchertown, MA	38
4/10/18	<i>Options for Regulating Vegetative Growth of Apples for 2018 (DWG)</i>	UMass Extension Fruit Twilight Meeting	UMass Cold Spring Orchard, Belchertown, MA	38
4/11/18	<i>Addressing key arthropod pests: 2018 research plan (JP)</i>	UMass Extension Fruit Twilight Meeting	Carlson's Orchard, Harvard, MA	63
4/11/18	<i>Changes and Updates in Apple Disease Management for 2018 (DRC)</i>	UMass Extension Fruit Twilight Meeting	Carlson's Orchard, Harvard, MA	63
4/11/18	<i>Effective use of Prohexadione calcium for Growth Control of Apples (DWG)</i>	UMass Extension Fruit Twilight Meeting	Carlson Orchards, Harvard, MA	63
4/12/18	<i>Addressing key arthropod pests: 2018 research plan (JP)</i>	UMass/URI Extension Fruit Twilight Meeting	Steere Orchards, Greenville, RI	41
4/12/18	<i>Changes and Updates in Apple Disease Management for 2018 (DRC)</i>	UMass/URI Extension Fruit Twilight Meeting	Steere Orchards, Greenville, RI	41
5/8/18	<i>2018 Research Plan for Plum Curculio (JP)</i>	UMass Extension Fruit Twilight Meeting	Apex Orchard, Shelburne, MA	38
5/8/18	<i>Fire Blight Management (DRC)</i>	UMass Extension Fruit Twilight Meeting	Apex Orchard, Shelburne, MA	38
5/8/18	<i>Suggestions for Increasing Branching on your Trees with the use of Plant Growth Regulators (DWG)</i>	UMass Extension Fruit Twilight Meeting	Apex Orchard, Shelburne, MA	38
5/10/18	<i>Plum Curculio Update (JP)</i>	UMass Extension Fruit Twilight Meeting	Foppema's Farm, Sutton, MA	46
5/10/18	<i>Fire Blight Management (DRC)</i>	UMass Extension Fruit Twilight Meeting	Foppema's Farm, Sutton, MA	46
5/10/18	<i>Suggestions for Effective Chemical Thinning of Apples in 2018 (DWG)</i>	UMass Extension Fruit Twilight Meeting	Foppema's Farm, Sutton, MA	46
5/17/18	<i>Tour of the UMass Cold Spring Orchard Outlining Research and Outreach Activities Being Done at the Facility (DWG)</i>	Annual Meeting of Extension Personnel with the Extension Board of Public Overseers	UMass Cold Spring Orchard, Belchertown, MA	35
5/24/18	<i>Spotted Wing Drosophila Management Update (SGS)</i>	RI Fruit Grower's Assoc. Twilight Meeting	Ward's Berry Farm, Sharon, MA	40
6/4/18	<i>Plum Curculio Research Update (JP)</i>	RI Fruit Grower's Assoc. Twilight Meeting	Barden Family Orchard.	45
6/13/18	<i>Plum Curculio Research Update and Summer Arthropod Pests (JP)</i>	CT Pomological Society Twilight Meeting	Bishops Orchard, Guilford, CT	60
6/29/18	<i>Understanding the Timely use an Application of Plant Growth Regulators-An In-depth Orchard Tour (DWG)</i>	Cornell University	NYAES, Geneva, NY	85
7/10/18	<i>Demonstration on Grape Thinning Research Trial (EP)</i>	Massachusetts Fruit Growers Association, UMass Extension Fruit Program	UMass Cold Spring Orchard, Belchertown, MA	115
7/10/18	<i>Use of Exclusion Netting for Control of Spotted Wing Drosophila (SWD) in Black Raspberries (SGS, JK)</i>	Massachusetts Fruit Growers Association, UMass Extension Fruit Program	UMass Cold Spring Orchard, Belchertown, MA	115

7/10/18	<i>Cider Apple: grafting and a look to the future (EWG)</i>	Massachusetts Fruit Growers Association, UMass Extension Fruit Program	UMass Cold Spring Orchard, Belchertown, MA	115
7/10/18	<i>Plum Curculio Research Update and Summer Arthropod Pests (JP)</i>	Massachusetts Fruit Growers Association, UMass Extension Fruit Program	UMass Cold Spring Orchard, Belchertown, MA	115
7/10/18	<i>Summary of the Chemical Thinning Research and Results Being Conducted at the UMass Cold Spring Orchard (DWG)</i>	Massachusetts Fruit Growers Association, UMass Extension Fruit Program	UMass Cold Spring Orchard, Belchertown, MA	115
7/24/18	<i>Black Rot of Grapes (EP)</i>	UConn Extension and USDA RMA	Paradise Hills Vineyard & Winery, Wallingford, CT	30
8/25/18	<i>Influence of High Rates of ReTain on Preharvest Drop, Fruit Quality and Storage Potential of Honeycrisp (DWG)</i>	Forty Years Advancing Fruit Production: Applied Physiology, PGRs, Rootstock and Orchard Systems	Traverse City, MI	125
9/21/18	<i>Fundamentals of Decision Support Systems in an Apple IPM Program (EWG)</i>	Farm Aid Tour	West Hartford, CT	12
Total:				1,664

CONFERENCES OR SYMPOSIA ORGANIZED FOR COMMERCIAL GROWERS, PROFESSIONAL SERVICE PROVIDERS AND INDUSTRY.				
Events Organized by Fruit Team member(s) (in whole or part)				
Date	Event Title	Conference Sponsor (s)	Location	Attendance
10/10-11/17	<i>MyIPM Application Development (JMC)</i>	MyIPM Working Group	Clemson Univ., S. Carolina	15
10/24-24/17	<i>New York/New England/Canadian Fruit Pest Management Working Group (JMC)</i>	79 th Annual New England, New York, and Canadian Fruit Pest Management Workshop	Burlington, VT	50
11/14-15/17	<i>NC-140 Regional Rootstock Research Project Annual Meeting (JMC)</i>	NC-140 Regional Rootstock Working Group	Wenatchee, WA	50
12/12/17	<i>2017 Massachusetts Fruit Growers Annual Meeting (JMC, DWG, WRA)</i>	UMass Extension Fruit Program Massachusetts Fruit Growers Ass.	Manchester, NH	150
12/12-13/17	<i>Tree Fruit I and Tree Fruit II Sessions at NEVFC (DWG)</i>	New England Extension, Cornell, MOFGA, MFGA, NEVBGA	Manchester, NH	280
12/12-14/17	<i>2017 New England Vegetable & Fruit Conference (SGS, JMC, HAS)</i>	New England & Cornell University Extension Programs, Maine Organic Farmers Assoc., New England Vegetable & Berry Growers Assoc., Massachusetts Fruit Growers Assoc.	Manchester, NH	1500

12/13/17	<i>Stone Fruit Session at NEVFC (JMC)</i>	New England Extension, Cornell, MOFGA, MFGA, NEVBGA	Manchester, NH	217
12/13/17	<i>Wine Grapes Session at NEVFC (SGS)</i>	New England Extension, Cornell, MOFGA, MFGA, NEVBGA	Manchester, NH	52
2/23/18 - 3/8/18	<i>International Fruit Tree Association Annual Conference and Study Tour (JMC)</i>	International Fruit Tree Association	Napier, Nelson and Christchurch, New Zealand	225
3/13 - 14/18	<i>Northeast Plant Growth Regulator Annual Meeting (JMC, DWG)</i>	Northeast Plant Growth Regulator Working Group	Wilkes Barre, PA	38
2/3/18	<i>NEVGBA Winter Meeting (SGS)</i>	UMass Extension/NEVBGA	Hudson Portugese Club, Hudson, MA	75
3/9/18	<i>eIPM Stakeholder Meeting (HAS JMC, SGS, AFT, EWG)</i>	UMass Vegetable & Fruit Teams	Brigham Hill Farm, Grafton MA	25
TOTAL:				2,677

Presentations given at Conferences or Symposia and Webinars.

Date	Talk or presentation Title	Name of Meeting and Sponsor (s)	Location	Attendance
10/24-24/17	<i>UMass RIMpro Advisory Service (JMC)</i>	79th Annual New England, New York, and Canadian Fruit Pest Management Workshop	Burlington, VT	50
10/24-24/17	<i>iPiPE Northeast Apple Crop Pest Program (JMC)</i>	79th Annual New England, New York, and Canadian Fruit Pest Management Workshop	Burlington, VT	50
11/1-3/17	<i>UMass RIMpro Advisory Service (JMC)</i>	2017 Great Lakes Fruit Workers Meeting	Port Huron, MI	60
11/1-3/17	<i>iPiPE Northeast Apple Crop Pest Program (JMC)</i>	2017 Great Lakes Fruit Workers Meeting	Port Huron, MI	60
11/4/17	<i>Getting Ready for Thinning Nest Year's Apple Crop (DWG)</i>	Risk Management Conference for Orchardists	Goffstown, NH	56
11/4/17	<i>Fruit Varieties to Consider Planting in the Future - What's New (DWG)</i>	Risk Management Conference for Orchardists	Goffstown, NH	56
12/1/17	<i>Pruning Fruit Trees (WRA)</i>	New England Grows	Boston, MA	825
12/4/17	<i>Disease Forecast Models: When Climate Changes the Rules (EWG)</i>	UMass Stockbridge School of Ag.	Amherst, MA	25
12/5/17	<i>Chemical Thinning in Difficult Times (DWG)</i>	Great Lakes Fruit and Vegetable Conference, EXPO,	Grand Rapids, MI	300
12/5/17	<i>Understanding and Improving the Precision of the Fruit Growth Model (DWG)</i>	Great Lakes Fruit and Vegetable Conference, EXPO,	Grand Rapids, MI	250
12/13/17	<i>15 Years of Peach Variety Evaluation at the UMass Orchard (JMC)</i>	2017 New England Vegetable & Fruit Conference	Manchester, NH	100
12/13/17	<i>Strategies for Canopy Management for Optimal Juice Quality (EP)</i>	2017 New England Vegetable & Fruit Conference	Manchester, NH	40
12/13/17	<i>Grape Weed Management Update (HAS)</i>	2017 New England Vegetable & Fruit Conference	Manchester, NH	50

12/13/17	<i>Basic Canopy & Cluster Management During the Growing Season (SGS, GH)</i>	2017 New England Vegetable & Fruit Conference	Manchester, NH	125
1/22/18	<i>MyIPM: A Smartphone App for Orchard Management (JMC)</i>	2018 Wisconsin Fresh Fruit and Vegetable Conference	Wisconsin Dells, WI	125
1/23/18	<i>New Apple Plantings: Rootstocks and other Decisions (JMC)</i>	2018 Wisconsin Fresh Fruit and Vegetable Conference	Wisconsin Dells, WI	125
2/6/18	<i>Use of Plant Bioregulators to Optimize Apple Quality and Labor at Harvest (DWG)</i>	Valent Biosciences, The Web (Webinar)	N/A	80
2/27/18	<i>Using Mobile Apps in Eco Apple (DRC)</i>	IPM Institute and Red Tomato, Inc.	Henry Wallace Center, Hyde Park, NY	40
3/13/18	<i>Effect of Bloom MaxCel and 10 mm NAA Application on Fruit Set of Gala Apples (DWG)</i>	Northeast Plant Growth Regulator Working Group	Wilkes-Barre, PA	38
3/13/18	<i>Evaluation Of Metamitron Formulations and Spray Volume on Thinning of Summerland McIntosh (DWG)</i>	Northeast Plant Growth Regulator Working Group	Wilkes-Barre, PA	38
3/13/18	<i>Influence of High Rates of ReTain on Pre-harvest Drop, Fruit Quality and Storage Potential of Honeycrisp Apples (DWG)</i>	Northeast Plant Growth Regulator Working Group	Wilkes-Barre, PA	38
3/19/18	<i>Strategies for Canopy Management for Optimal Juice Quality (EP)</i>	UConn Extension Webinar Series (Webinar)	N/A	25
5/15/18	<i>Strategies for canopy management for optimal juice quality- Effet de l'éclaircissage et de l'épamprage sur la qualité du jus de variétés adaptées au froid (EP)</i>	Centre de référence en agriculture et agroalimentaire du Québec, Canada (Webinar)	N/A	100
9/22/18	<i>Sustainable Apple Production in the Northeast (EWG)</i>	Farm Aid Conference	West Hartford, CT	500
Total:				3,156

MEETINGS OR WORKSHOPS FOR HOME GARDENERS OR MASTER GARDENERS				
Home Gardener or Master Gardener Workshops <u>Organized</u>				
Date	Workshop Title	Location	Attendance	
2/24/18 - 4/14/18	2017 MassAggie Spring Seminar Series <ul style="list-style-type: none"> • Pruning Grapes • Edible Landscaping • Home Orchard Pruning • Pruning Blueberries • Home Orchard Establishment • Home Orchard Pest Management • Pollinator Biology & Conservation 	Various (see below)	157	
Total:			157	
Presentations for Home Gardeners/Master Gardeners				
Mass Aggie Workshops				
2/24/18	<i>Pruning Grapes (SGS)</i>	UMass Extension Fruit Program	UMass Cold Spring Orchard, Belchertown, MA	23
3/3/18	<i>Edible Landscaping (SGS)</i>	UMass Extension Fruit Program	UMass Amherst Campus, Amherst, MA	14
3/24/18	<i>Home Orchard Pruning (JMC)</i>	UMass Extension Fruit Program	Windy Hill Farm, Gt. Barrington, MA	35
3/31/18	<i>Pruning Blueberries (SGS)</i>	UMass Extension Fruit Program	Nicewicz Farm, Bolton, MA	43
4/7/18	<i>Home Orchard Establishment & Basics (JMC)</i>	UMass Extension Fruit Program	Windy Hill Farm, Gt. Barrington, MA	30
4/7/18	<i>Home Orchard Pest Management (JMC, DRC)</i>	UMass Extension Fruit Program	Windy Hill Farm, Gt. Barrington, MA	30
4/14/18	<i>Pollinator Biology & Conservation(SGS)</i>	UMass Extension Fruit Program	UMass Amherst Campus, Amherst, MA	12
Total:				157
Master Gardener Trainings				
10/17/17	<i>Small Fruit Production (SGS)</i>	Mass Master Gardeners Assoc. Training	Tower Hill Botanical Garden, Boylston MA	45
10/19/17	<i>Small Fruit Production (SGS)</i>	Mass. Master Gardeners Assoc. Training	Elm Bank Reservation, Wellesley, MA	50
2/20/18	<i>Weed Management (HAS)</i>	Cape Cod Master Gardeners Assoc. Training	Barnstable Court House, Barnstable, MA	15
3/6/18	<i>Small Fruit Production (SGS)</i>	Barnstable County Master Gardeners Assoc. Training	Barnstable, MA	55
3/17/18	<i>Growing & Pruning Blueberries (SGS)</i>	Western Mass Master Gardeners Assoc. Symposium	Frontier Regional High School, S. Deerfield, MA	35
Total:				200

Other				
2/8/18	<i>Tree Fruit in the Landscape (WRA)</i>	Mass. Hort. Society	Elm Bank Reservation, Wellesley, MA	20
3/11/18	<i>From the American Plagues to Probiotics for Grapes: A History of Challenges and Opportunities for Grapes in the Northeastern US (EP)</i>	Circolo Italiano	Nacul Center, Amherst MA	25
3/14/18	<i>Starting and Apple Orchard (WRA)</i>	Princeton Agricultural Commission	Princeton, MA	55
3/30/18	<i>Pruning Fruit Trees (WRA)</i>		UMass Cold Spring Orchard, Belchertown, MA	8
4/17/18	<i>Introduction to Tree Fruit and Apple Pruning (EWG, JMC)</i>	UMass Ag. Learning Center	UMass, Amherst, MA	10
4/21/18	<i>Apple Grafting Workshop (WRA)</i>	Mass. Hort. Society	Elm Bank Reservation, Wellesley, MA	15
6/10/18	Connection to Wine and Grape Culture in New England (EP)	Ganei Beantown: Beantown Jewish Gardens	Temple Israel, Boston, MA	15
Total:				138

FIELD RESEARCH & DEMONSTRATION PROJECTS (at UMass Cold Spring Orchard or Cooperating Grower Locations)			
Research Projects:			
Title of the Project	Collaborating or Supporting Agency	Location of Project	# of people educated or impacted
<i>Precision Crop Load/Thinning Management Of Apples (JMC)</i>	UMass Center for Agriculture, Food and the Environment (CAFE)	UMass Cold Spring Orchard	115
<i>Asian Pear Fire Blight Canker Study (JMC)</i>	Cornell University's Hudson Valley Laboratory	UMass Cold Spring Orchard	115
<i>2018 UMass RIMpro Advisory Service</i> http://fruitadvisor.info/rimpro/ <i>(JMC, EWG, DRC)</i>	New England Tree Fruit Research Committee	Various locations (12) in New England	350
<i>iPiPE Northeast Apple Crop-Pest Program (JMC, EWG)</i>	North Carolina State Univ. & Pennsylvania State Univ.	Statewide in Massachusetts	1,000
<i>Refining an Attracticidal Sphere Management System for Spotted Wind Drosophila in Small Fruit Production (JP, AFT, EWG, SGS)</i>	USDA	Nourse Farms, Whately MA	75
<i>2010 NC-140 Apple Rootstock Trial (WRA, JMC)</i>	USDA Hatch Multistate Project	UMass Cold Spring Orchard, Belchertown, MA	100
<i>2010 NC-140 Fuji Apple Rootstock Trial (WRA, JMC)</i>	USDA Hatch Multistate Project	Various locations	100

2014 NC-140 Honeycrisp Apple Rootstock Trial (JMC)	USDA Hatch Multistate Project	UMass Cold Spring Orchard	100
2015 NC-140 Geneva/Modi organic apple rootstock planting (JMC, WRA)	USDA Hatch Multistate Project	Small Ones Farm, Amherst, MA	100
2018 NE-1720 Multi-state Evaluation of Winegrape Cultivars and Clones (SGS, EP)	USDA Hatch Multistate Project	UMass Cold Spring Orchard, Belchertown, MA	60
Dynamic Apple Disease Management: Forecasting Apple Scab and Fire Blight Under Changing Climatic Conditions (EWG, DRC, AFT, JMC)	USDA NE-IPM	UMass Cold Spring Orchard, Belchertown, MA, Clarkdale Fruit Farms, Deerfield, MA, Red Apple Farm, Phillipston, MA	100
Influence of metamitron on fruit set of McIntosh apples (DWG)	Adama	UMass Cold Spring Orchard, Belchertown, MA	100
Thinning apple trees with trunk injection (DWG)	Rainbow Tree Company	UMass Cold Spring Orchard	50
Total:			2,365

Demonstration Projects			
Title of the Project	Collaborating or Supporting Agency	Location of Project	Number of people educated or impacted
Apple Variety and Systems Demonstration Plantings (JMC)	UMass Center for Agriculture, Food and the Environment (CAFE)	UMass Cold Spring Orchard	115
Peach Variety and Systems Demonstration Planting (JMC)	UMass Center for Agriculture, Food and the Environment (CAFE)	UMass Cold Spring Orchard	115
Apple variety evaluation/demonstration planting(s) for Rutgers/AC Nursery, Apple Variety Development LLC, and Regal Fruit Intl. (JMC)	Rutgers University AC Nursery Apple Variety Development, LLC Regal Fruit Intl.	UMass Cold Spring Orchard, Belchertown MA	50
Cold Hardy Wine Grapes (not part of NE-1720) (SGS, EP)		UMass Cold Spring Orchard, Belchertown MA	115
Cold Hardy Seedless Table Grapes (SGS, SM, KMH, JK)		UMass Cold Spring Orchard, Belchertown MA	50
Evaluation of Honeycrisp strains (DWG)	Univ. Minnesota not supported	UMass Cold Spring Orchard	50
Evaluation of MN 55 (DWG)	Univ. Minnesota not supported	UMass Cold Spring Orchard	50
Exclusion Netting for Control of SWD in Black Raspberry Production (SGS, JK)	USDA EP Grant	UMass Cold Spring Orchard, Belchertown MA	100

<i>NEWA Weather Network (JMC, AFT, DRC)</i>	USDA EIP Grant, MA AES	21 on-site weather station across the state	100
<i>Demonstration of Drones for IPM in Agriculture (HAS)</i>	USDA EIP Grant, MA AES	UMass Cranberry Station	35
<i>Native Pollinator Conservation Habitat Project (JK, SGS)</i>		UMass Cold Spring Orchard	25
<i>Effectiveness of odor-baited trap trees as an attract-and-kill strategy for adult plum curculio, and of entomopathogenic nematodes (EPN) as biological control agents against plum curculio larvae in the soil (JP)</i>		8 commercial orchards	100
<i>Effectiveness of pheromone-baited ghost traps for attract-and-kill of the invasive Brown Marmorated Stink Bug (JP)</i>		3 commercial orchards	50
<i>SWD Monitoring and Reporting Network (SGS, AFT, EWG)</i>	USDA EIP Grant	8 locations across the state	200
<i>Swing Arm Trellis Demonstration for Blackberry and Black Raspberry Production in New England (SGS)</i>	Massachusetts Fruit Growers Assoc.	UMass Cold Spring Orchard, Belchertown MA	115
Total:			1,270
Additional Sponsored Activity			
Type	Description		
Grant	Autio W. R. , <i>Research & Extension 2017, 1/1/2018 - 12/31/2018, \$3,050</i>		
Grant	Autio W. R. , Marini R, Cline J, Reighard G, Lang G, Einhorn T, <i>NC-140 Treefruit Research, 4/1/2017 - 3/31/2018, \$10,000</i>		
Grant	Autio W. R. , Marini R, Cline J, Robinson T, Reighard G, Lang G, Einhorn T, <i>NC-140 Treefruit Research, 4/1/2018 - 3/31/2019, \$10,000</i>		
Grant	Clements, J. M. , <i>iPipe Northeast Apple Crop Pest Program Coordination, 10/1/17 - 9/30/18. \$38,872</i>		
Grant	Clements, J. M., D. R. Cooley , <i>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</i>		
Grant	Cooley, D. R. , <i>Evaluation of the Efficacy of Organic Materials in Controlling Fire Blight in New England. 3/1/2017 - 2/28/18. \$19,997</i>		
Grant	Cooley, D. R., J. M. Clements , <i>A New England Tree Fruit Management Guide for the Next Generation. 3.1.2017 - 10/31/2018 \$17,858</i>		
Revenue	Greene D. R., McIntire S., Hanley K. M., Schloemann S. G., Clements J. M., Krupa J. S., Autio W. R. , <i>Income in support of the operation of the UMass Cold Spring Orchard Research and Education Center, 10/1/2017 - 9/31/2018 \$318,000</i>		
Grant	Greene, D. W. , <i>Fruit Research 2 \$4,364</i>		
Grant	Greene, D. W. , <i>Fruit Research 2 \$9,000</i>		
Grant	He L, Decker E, Autio W. R. , Xiao H, <i>Barcoding juice quality using SERS, simultaneous determining the content of phytochemicals and adulterants. 1/1/2018 - 12/31/2021, \$498,838</i>		
Grant	Petit, E., S.G. Schloemann <i>Evaluation of Wine Juice Quality Following Various Shoot and Cluster Thinning Regimes, UMass Center for Ag, Food and Env Summer Scholars Program. \$5,000</i>		

Grant	Piñero, J.C. , Leskey, T.C., Shapiro, Ilan, D., Faubert, H., Concklin, M, and Hamilton, G., <i>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.</i> NIFA Crop Protection and Pest Management program. 9/1/18 – 8/31/2021). \$324,854
Grant	Piñero, J.C., Schloemann, S. G. , Simisky, T., Garofalo, E. W. , and Clements, J. M. , <i>Invasive Insect Pests Threatening Specialty Crops in Massachusetts: Research, Monitoring, Stakeholder Engagement and Education.</i> MA Department of Agricultural Resources 9/1/18 – 8/31/2020) \$40,700
Grant	Piñero, J.C. <i>Evaluation of aromatic compounds to improve attractiveness of traps and odor-baited trap trees for attract-and-kill of plum curculio using less inputs.</i> New England Tree Fruit Growers Research Committee 5/1/18 – 8/31/18) \$2,500
Grant	Piñero, J.C. <i>Raspberry Plot Monitoring.</i> USDA ARS 5/04/18 – 11/1/18) \$2,493
Grant	H. Sandler, PD , K. Campbell-Nelson, and J. Clements , <i>Supporting IPM on Massachusetts Specialty Crop Farms through the Integration of Applied Research and Extension Outreach.</i> USDA-NIFA, Extension Implementation Program. 9/1/17 – 8/31/2020. \$867,007
Revenue	Schloemann, S. G., J. M Clements, D. R. Cooley, E. W. Garofalo. <i>Income from Mass Aggie Workshop Series.</i> 2/18 – 4/18. \$7,688
Donation	Schloemann, S. G., J. M. Clements. <i>Fruit Team Sponsorship Donations.</i> \$4,700
	Total: \$2,192,914*

* this figure includes projects that are multi-year and shared across interdisciplinary teams, states or institutions, not solely for work done in a single year or only within the UMass Extension Fruit Program.

STUDENT INVOLVEMENT

Classes and Tours		Student #
UMass classes		
StockSch 198F <i>Develop a Business Plan and participate in an organic farming enterprise (3 credits) (DWG)</i>		1
StockSch 198F <i>Intern as a crop production specialist (3 credits) (DWG)</i>		1
StockSch 235 <i>Pruning Fruit Crops labs (WRA- 8 labs)</i>		17
UMass 298Y: <i>Practicum Internship at Agronomy Farm Vineyard (3 credits) (EP)</i>		1
StockSch 300 <i>Deciduous Orchard Science (DWG – 13 labs)</i>		15
StockSch 390G <i>Sustainable Grape Production (2 credits) (EP – 8 labs)</i>		18
StockSch 397GB ST <i>Grapevine Biology (EP– 8 labs)</i>		11
Undergraduate Summer Scholar Internship – <i>Spotted Wing Drosophila Biology and Management (1 credit) (JP)</i>		1
Undergraduate Summer Scholar Internship - <i>Effect of cluster thinning on sugar and acidity of fruits for the grape variety Frontenac (1 credit) (EP)</i>		1
Non-UMass classes		
<i>Farm School class/lab:</i>		
– <i>Grape Production (SGS, lecture)</i>		16
– <i>Grape Pruning (SGS, lab)</i>		16
Educational Tours at UMass Cold Spring Orchard		
<i>School Tours (Pre-K to High School ages) (SH, KMH, JC)</i>		960
<i>Stockbridge School of Agriculture 100th Anniversary Tour (DWG, EWG,)</i>		35
Total:		1,093

AFT-Arthur Tuttle, **AMM**-Angela Madieras, **DRC**-Daniel Cooley, **DWG** – Duane Greene, **EWG** – Elizabeth Garofalo, **EP** – Elsa Petit, **HAS** – Hilary Sandler, **JA** – Jacob Aliengena, **JC** – James Cronk, **JMC** – Jon Clements, **JK** – James Krupa, **KMH** – Kristen Hanley, **JP**- Jaime Piñero, **SGS** – Sonia Schloemann, **SM** – Shawn McIntire, **WRA** – Wesley Autio. **Bold**=Fruit Team Members 19

DIAGNOSTICS AND CONSULTING

Grower consultation/recommendations		
	Number	Comments
<u>Phone or email consultations</u>		
A. Tuttle	41	
S. Schloemann	357	
J. Clements	500	
E. Garofalo	55	Total: 953
<u>Diagnostic recommendations</u>		
A. Tuttle	9	
S. Schloemann	21	
J. Clements (including 50 eXtension 'ask the expert' recommends)	52	
E. Garofalo	50	
Diagnostic Lab	58	Total: 190
<u>Site visits</u>		
A. Tuttle	25	
S. Schloemann	18	
J. Clements	100	
E. Garofalo	100	Total: 243

AWARDS

Awards And Other Citations	
Title	Recipient(s)
<i>P. H. Shepard Award (American Pomological Society) for the best paper published in the Journal of the American Pomological Society</i>	Marini, R, W Autio , B Black, J Cline, W Cowgill, R Crassweller, C Hampson, M Kushad, R Moran, M Parker, R Perry, G Reighard, T Robinson, and D Wolfe
<i>Distinguished Teaching Award (nominated)</i>	E. L. Petit

OTHER OUTPUTS

Working Group Participation and Other Collaborations		
Title	Meeting dates	Fruit Team Participants
Great Lakes Fruit Workers	November 1-3, 2017	JMC
NE-1020 Multi-state Evaluation of Winegrape Cultivars and Clones	Nov. 14-15, 2017	SGS, EP
NC-140 Regional Rootstock Project, Technical Committee	Nov. 14-15, 2017	WRA, JMC
Northeast Berry Call-In	Weekly April-July '18	SGS, HAS
Northeast Plant Growth Regulator Working Group	March 13-14, 2018	JMC, DWG, JK
Organic IPM Working Group	Monthly calls	DRC
Spotted Wing Drosophila Working Group	Feb. 12-13, 2018	SGS, JP
Northeast Tree Fruit IPM Working Group	Oct. 18-19, 2017	DRC, JMC, AFT, EWG
Network for Environment and Weather Applications	Monthly calls	JMC, DRC
UMassAir 5-College Collaborative with UMass Transport Center	Quarterly meetings	HAS

OTHER MAJOR RESPONSIBILITIES OF TEAM MEMBERS	
Name	Description
Autio, Wesley	<ul style="list-style-type: none"> • Department Chair and Director of UMass Stockbridge School of Agriculture (http://stockbridge.cns.umass.edu/) • Alpha Tau Gamma • Fred P. Jeffrey Professorship • Senior Editor <u>Fruit Notes Journal</u> • Co-Editor <u>Horticultural News</u> • Ad hoc reviewer for Journal of the <u>American Pomological Society</u> • Resident agent for the <u>American Pomological Society</u> • Member Pomology, Postharvest, and Rootstock/Rhizosphere working groups of <u>American Society for Horticultural Science</u> • Member, Executive Committee, NC-140 Technical Committee • Project Coordinator NC-140 Honeycrisp Apple Rootstock Trial • Project Coordinator NC-140 Fuji Apple Rootstock Trial • Project Coordinator NC-140 Organic Apple Rootstock Trial • Ad hoc member School of Earth & Sustainability Committee • Ad hoc member of UMass Frank Waugh Arboretum Committee • Ad hoc member of UMass Enrollment Management Committee • Ad hoc member of UMass Academic Matters Council • Secretary & Treasurer, Massachusetts Fruit Growers Association • Member, Mass. Horticultural Society Education Committee • Trustee, Mass. Horticultural Society • Member, Tower Hill Botanical Garden Horticultural Committee • Member of numerous graduate student committees (16)
Clements, Jon	<ul style="list-style-type: none"> • State Contact/Coordinator, Massachusetts Network for Environment & Weather Applications (<u>NEWA</u>) • Member International Fruit Tree Association Board of Directors (http://www.ifruittree.org/dnn/default.aspx) • Member of New England Vegetable & Fruit Conference Program Committee, Media chair and session chair for Stone Fruit session. (http://www.newenglandvfc.org/)
Cooley, Daniel	<ul style="list-style-type: none"> • Chair of Tree Fruit Entomologist Search Committee • Ad Hoc member of School of Earth & Sustainability Steering Committee • Ad Hoc member of Plant & Soil Science Graduate Program Committee • Ad Hoc member of Stockbridge School Executive Committee • Ad Hoc member Stockbridge School Undergraduate Curriculum Committee • Ad Hoc member Plant Biology Steering Committee • Ad Hoc member CNR Curriculum Committee • Ad Hoc member UMass Faculty Senate • Ad Hoc member SSA Calendar Committee • Ad Hoc reviewer Crop Protection • Ad Hoc reviewer Plant Disease
Greene, Duane	<ul style="list-style-type: none"> • Member Department representative on the College Personnel Committee • Member Stockbridge School of Agriculture Awards committee • Member Stockbridge School of Agriculture Undergraduate Program committee • Member Stockbridge School of Agriculture Undergraduate recruitment committee • Member of new Tree Fruit Entomologist search committee

	<ul style="list-style-type: none"> • Director of UMass Cold Spring Orchard Research and Education Center Management Team (http://www.coldspringorchard.com/) • Editorial Board and Associate Editor <u>International Journal of Fruit Science</u> • Ad hoc member of the Plant Growth Regulators in Fruit and Nut production Working Group, American Society for Horticultural Science. • Ad hoc member of the Viticulture and Small Fruit Working Group, American Society for Horticultural Science • Ad hoc member of the Postharvest Working Group, American Society for Horticultural for Science. • Steering Committee member New England Vegetable and Fruit Conference • Session Chairperson, section organizer and moderator for the Tree fruit sessions at the New England Vegetable and Fruit Conference. • Associate Editor of International Journal of Fruit Science • Ad hoc reviewer for HortScience • Ad hoc reviewer for HortTechnology • Ad hoc reviewer for Acta Horticulturae • Ad hoc reviewer for Canadian Journal of Plant Science • Ad hoc reviewer for Journal of the American Pomological Society
Petit, Elsa	<ul style="list-style-type: none"> • Member General Education Council member (since Fall 2015)- Involves monthly 3-hours meeting and reviewing 1-2 courses /month that are submitted as GenEd or IE. • Member Senior lecturer review committee at the CNS college level (since Spring 2016) - Involves reviewing promotion files for lecturers going for the senior-level promotion and 2 meetings. • Co-chair, Ad Hoc Committee on Language Proficiency • Member, SSA Seminar Committee • Ad hoc reviewer for Plant Disease Journal • Ad hoc Panelist for Sustainable Agriculture Research and Education (SARE), Northeast, Partnership grants.
Piñero, Jaime	<ul style="list-style-type: none"> • Chair Stockbridge School of Agriculture Undergraduate Recruitment Committee • Member Stockbridge School of Agriculture International Affairs Committee • Member Stockbridge School of Agriculture Graduate Program Committee
Sandler, Hilary	<ul style="list-style-type: none"> • Director, UMass Cranberry Experiment Station • State Coordinator, Northeast Extension Integrated Pest Management Program (http://nifa.usda.gov/program/integrated-pest-management-program) • Associate Editor, Weed Science • Secretary, Weed Science Society of America • Member of New England Vegetable & Fruit Conference Program Committee • Ad hoc reviewer Weed Technology, Torrey Botanical Society
Schloemann, Sonia	<ul style="list-style-type: none"> • Interim Co-Director of UMass Extension Agriculture & Commercial Horticulture Program • Leader, UMass Extension Fruit Team • Program Chair, 2017 New England Vegetable & Fruit Conference (http://www.newenglandvfc.org/) • Senior Editor 2017-18 New England Small Fruit Management Guide (https://ag.umass.edu/fruit/ne-small-fruit-management-guide) • Member of New England Vegetable & Berry Growers Program Committee • Member of UMass CAFE Strategic Review Committee • Technical Advisor SARE Grower Grant; <i>FNE18-913 System Modifications and Varieties for Extending the Organic Strawberry Plasticulture Ripening Season in MA</i>