University of Massachusetts Fruit IPM Report for 2017

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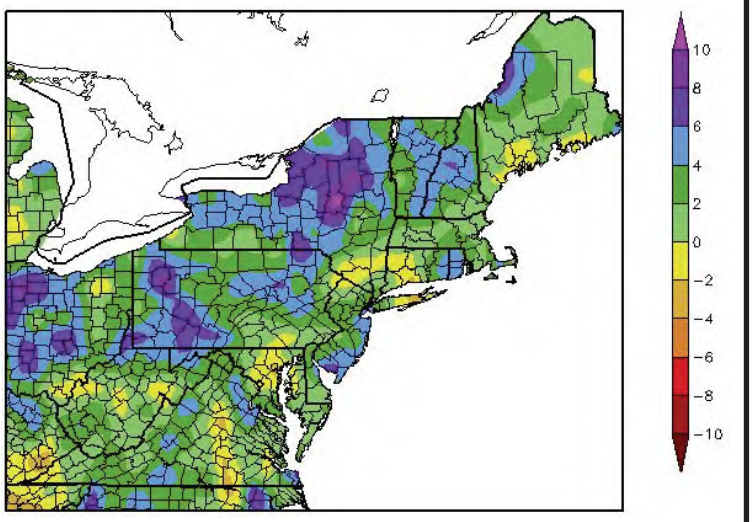
Weather

A winter low temperature of 2º F. in Belchertown was recorded on January 9, well above any temperature that would cause fruit bud damage. Otherwise, winter was fairly unremarkable with average snowfall. Spring came in fits, with a record cold temperature of 12º F. on March 23 followed just three weeks later by 84º F. on April 11. Because of the significant temperature fluctuations, there were some concerns about flower bud damage, however, both apple and peach bloom were profuse. Green tip of apple in Belchertown was April 10, bloom began approximately on May 1 and was quite protracted, lasting nearly 2 weeks. Weather during bloom was cool and wet, causing concern about potential pollination and fruit set. This lead to under-application and/or generally poor efficacy of chemical thinners in most cases and heavy fruit set. Wetter than normal weather in early to mid-season contributed to several disease problems, outlined below. The summer was generally benign, however, significant hail damage occurred in some orchards in central Massachusetts on June 27. The peach harvest was smooth and many peaches were picked. Late August into early September was cooler than average, and apples colored up nicely. However, mid-September turned warm to hot with the season's high temperature of 91º F on September 24. It was also dry fall which was favorable for harvest. Many, many apples were picked, likely one of the biggest apple crops in 10 years.



Map of the Northeast showing departure from normal precipitation in inches over the 90 days from April 26 to July 25, 2017 (Northeast Regional Climate Center).

Diseases

Apple scab was challenging for many growers this year. The wet spring made protective fungicides hard to apply, and sprays quickly washed off. There appeared to be more scab in commercial orchards this year than in any of the last four. Trap trees were set out at Cold Spring Orchard again this year, confirming seven infection events during the primary season.

Cool temperatures during a prolonged bloom period made **fire blight** blossom infection pretty much a non-issue. Some later season strikes were found in orchards where hail might have been the driving factor. Significant shoot blight was observed in one orchard in western Massachusetts where late bloom, pruning style (too many vigorous water sprouts) and a wet summer all contributed to infections.

There were some problems with **phytophthora crown and root rot** in new plantings. The wet weather

Phytophthora-afflicted apple trees in 1st-leaf apple orchard in eastern Massachusetts on August 31, 2017.

was ideal for the disease, and in a couple of cases led to significant tree death of trees planted this year, even on B.9, a relatively resistant rootstock. The problem may have originated with liners or nursery trees. In addition, there is some evidence that **southern rot** was also involved in one orchard.

Particularly nasty **fabraea leaf spot** (see photo) moved into Bosc pear at the UMass Orchard in late August. Wet summers are ideal for this disease to take hold. Season-long EBDC fungicides or Ziram, particularly during the summer and in wet seasons are need to control fabraea leaf spot.

In late August and September, a new leaf spot disease showed up on apples, identified as **Marssonina**

Fabraea Leaf Spot on Bosc pear in August at the UMass Orchard.

Marssonina Leaf Spot on Jonagold foliage, September 22.

Spotted-winged Drosophila in sweet cherries.

leaf spot. The disease has been an increasing problem in Europe and other parts of the world over the past 10-15 years. In these areas, premature defoliation is severe enough to cause premature fruit drop. While the disease was identified on leaves in Massachusetts, there was no significant defoliation or fruit loss, though some of this was reported in Connecticut and eastern New York.

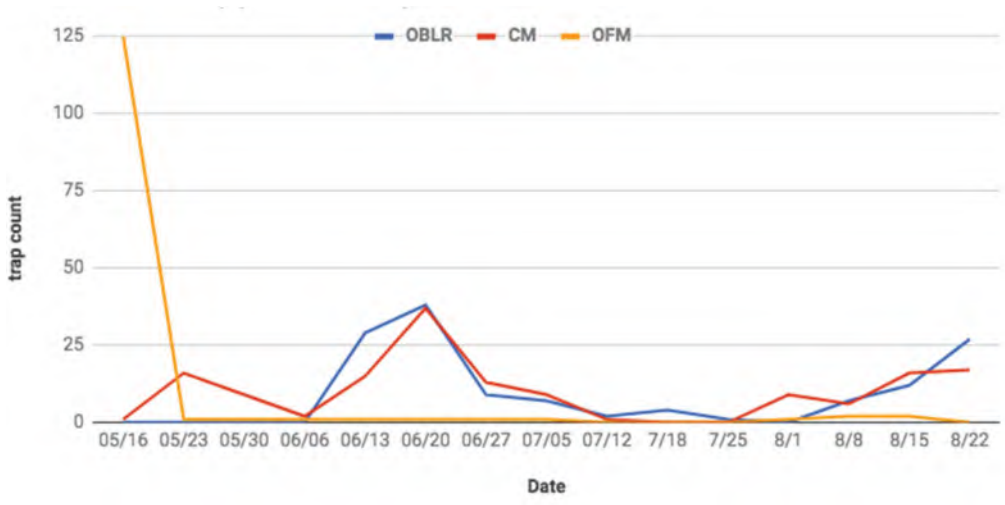
Insects

Spotted wing drosophila came in early and hard this year. One grower reported approximately an $8,000 loss in cherries due to adult egg laying and larval infestation of this pest. Traps placed at the UMass Orchard in a sweet cherry block caught SWD on July 3. See more on SWD in the small fruit section below.

Lepidopteran pests -- **Oriental fruit moth, codling moth, oblique-banded leafroller** -- despite high trap catches across the board, apparently caused very little fruit damage (or at least none in particular that we noted). We know targeted sprays were made for CM and OBLR in orchards where there is history of damage. Otherwise, it seems that the mandatory petal fall plum curculio sprays kept the majority of lepidopteran damage at least partially under control still (especially OFM).

Brown marmorated stink bug was monitored across the state by a group that included UMass Extension (EIP), iPiPE, Barnstable County Extension, Massachusetts Dept. of Agricultural Resources, and two independent crop consultants. Trap captures from 20 traps (mostly agricultural sites) and private home sightings were reported to MDAR. Trap catches were very low again in 2017 with a bit of an uptick in September and October. Thus far, no insecticide sprays have been reported to us that have specifically targeted this pest in Massachusetts orchards.

Brown Marmorated Stink Bug.



Lepidopteran pheromone trap captures in eastern Massachusetts orchard in 2017.

Horticulture

As previously noted, the apple bloom period was generally regarded as unfavorable. That turned out to be wrong. Chemical thinning was not aggressive enough, and apple fruit set was heavy. Not enough hand thinning occurred, and now there should be some concern about return bloom in 2018. Time will tell, fortunately the summer growing season when fruit buds are formed was favorable, so that will help. Remember, how many times have we over-thinned apples with chemicals? You are advised to be more aggressive when applying chemical thinners, going down the road. High crop loads do not create quality fruit on some varieties, particularly Honeycrisp, Jonagold, Golden Delicious, etc.

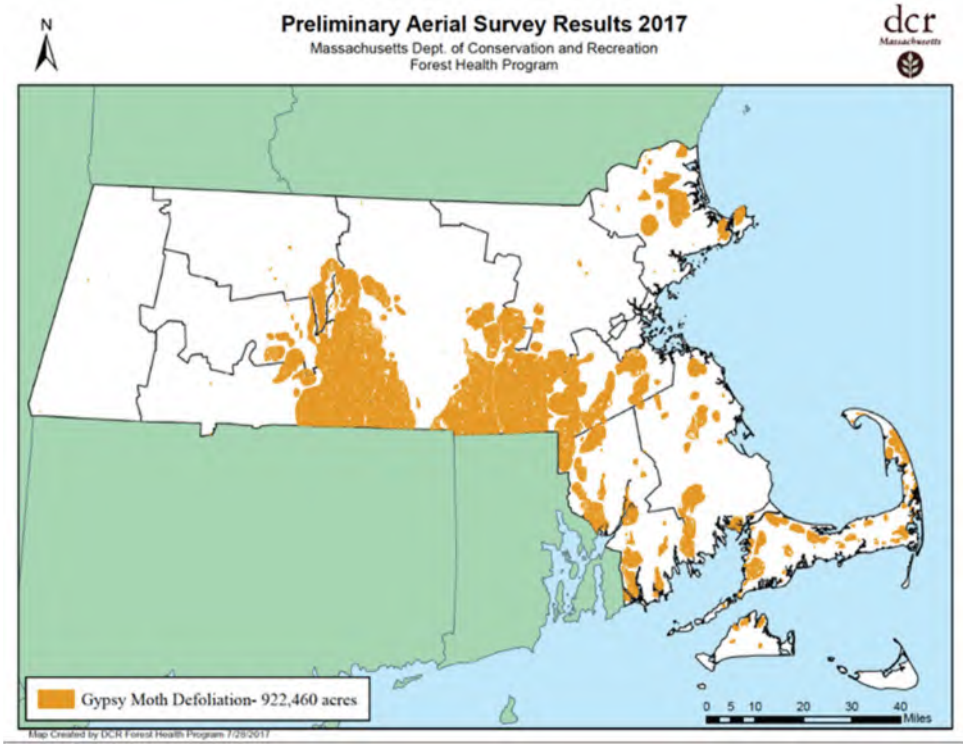
Also previously mentioned was phytophthora observed in newly planted trees. First off, if you even begin to wonder if a site is too wet to plant fruit trees, it is! Second, consider planting on mild berms -- particularly on wetter sites with heavier soils -- to get those roots into a more favorable (warmer and drier) situation, which will result in better young tree growth and earlier yields.

Gypsy Moth feeding on blueberry flowers.

Small Fruit

Winter moth egg hatch occurred during the second week of April in 2017; approximately 1 week later than in 2016. Blueberry growers reported very low levels of winter moth damage in 2017 achieving good control with timely oil/insecticide applications. One explanation could be that the biological control agent, *Cyzenis albicans*, a tachinid fly, that has been released by Dr. Joe Elkinton in 41 sites across Massachusetts (and has become established in 17 of these sites), may be having a measurable impact. However, this continues to be a difficult pest to manage. We published five *Massachusetts IPM Berry Blasts* (often in collaboration with Heather Faubert in RI) with information about winter moth.

Gypsy moth populations were extremely high in several regions of Massachusetts in 2017. This was



Extent of gypsy moth defoliation in Massachusetts in 2017.

thought to be largely due to the drought conditions in 2016 whereby the natural control agent *Entomophaga maimaiga* was suppressed by the dry conditions. The Massachusetts Department of Conservation & Recreation (DCR) estimated that over 362,000 acres were defoliated by gypsy Moth in 2016. DCR estimates over 922,000 acres were defoliated in 2017. Several blueberry growers reported significant crop loss due to Gypsy Moth feeding on flowers. A return to more typical precipitation helped to reactivate the *E. maimaiga* fungus and increased gypsy moth mortality later in the season; however, sufficient numbers survived to lay eggs for next year so this may be a problem again in 2018. Timely insecticide applications (e.g., B.t.) would likely control this pest.

Spotted Wing Drosophila (SWD) – Massachusetts maintained a 10-trap network for monitoring the onset of SWD activity for 2017. Scentinel or Pherocon traps and lures were used in most cases and traps were monitored on a weekly basis starting in mid June. SWD trap captures and fruit infestation occurred early in 2017 as compared to previous years. First capture coincided with sustained capture dates beginning at approximately June 27, 2017. This was at least 2 weeks earlier than in previous years and put some crops at risk that had not been considered vulnerable to SWD in the past; late ripening varieties of June bearing strawberries and sweet cherries. Growers of these crops suffered damage due to this unexpected population build up so early in the season. Weather conditions in mid through late summer with consistent rain and high humidity allowed for continuous buildup of SWD populations through the late growing season. Grape growers reported significantly high populations in vineyards during harvest. Some table grape growers suspended harvest early due to concerns about SWD infestation of their fruit. One twilight meeting, held at Nourse Farms in Whately, MA on June 15, 2017 and attended by 45, focused on SWD management recommendations for 2017. Four issues of Massachusetts IPM Berry Blast contained information on SWD pest status and management recommendations. Trap capture results from the ten site network were reported on iPipe.

Spotted-winged Drosophila trap.

Special Projects, Research, and Publications

The UMass RIMpro Advisory Service was formed thanks to financial support from the New England Tree Fruit Research Committee. Twenty-one RIMpro grower sites -- one in CT, ten in MA, five in ME, one in RI, three in VT, and one in NH -- were set up using either NEWA weather station or virtual/Meteoblue weather data, and participants received disease and pest management advice from UMass as well as individual visits. We are in the process of evaluating how the growers used RIMpro and how much uptake there will be going forward using this IPM decision aid tool.

A UMass team including extension educators, a graduate student, and two undergraduate students ran a pheromone trap network across Massachusetts orchards as part of the eIP and iPiPE Northeast Apple Crop Pest Program. Traps were checked weekly and pest incidence/counts were entered into the iPiPE portal. iPiPE is a collaborative effort between researchers, extension specialists, and growers that utilizes near real-time data to provide pest status, education, and outreach on a national scale.

Lead and hosted by UMass, the New England Tree Fruit specialists team contributed to the up-start on-line edition of the New England Tree Fruit Management Guide. In addition, UMass received a Northeast IPM Center grant to lead the team in developing a full-fledged on-line New England Tree Fruit Management Guide to be launched in time for the 2018 growing season.

An Eco Apple App was developed, the target audience being Eco Apple growers, the objective to make Eco-Apple-approved spray chemical information available by bud stage and pest. The app is free (thanks to some leftover Northeast SARE money) and can be

Ambrosia apple at UMass Cold Spring Orchard, October 2, 2017.

used by any apple grower wishing to restrict their spray chemical use to Eco Apple approved chemicals. The app is available on both the Google Play and Apple App Stores.

In collaboration with researchers at Cornell's Hudson Valley Lab, an Asian pear variety block at the UMass Orchard in Belchertown was inoculated with fire blight on June 26 to study the progress of canker development and viability into the following winter. Inoculation was a success, as shoot blight and canker development was significant by the end of the summer in most varieties. These trees will be removed before bud break in 2018.

Funded by Northeast SARE, and in cooperation with Quan Zeng at the Connecticut Experiment Station, a block of Jonagold apples at the UMass Orchard in Belchertown was first inoculated with fire blight during bloom on May 6 and then treated with several biological fire blight control/suppression sprays. Unfortunately, although we understand there was better "luck" in CT, absolutely no fire blight appeared, including in the control trees. Cool conditions during bloom were probably the reason no fire blight was seen. The experiment will be repeated again in 2018.

We participated in the weekly Northeast Regional Berry Call-in organized by Cornell University that brought together Extension and Industry and Growers from the Northeast (PA to Ontario) to discuss current observations and timely topics together. These calls are extremely useful for problem solving and general awareness of growing conditions and challenges. Calls started in mid-April and ran through July.

A UMass team including a research associate, graduate student, undergraduate Extension CAFE Scholar, and extension educator conducted a 6-week trial in an one acre block of Polana raspberries to test efficacy and placement of attracticidal spheres for management of spotted-wing *Drosophila.* This was part of a multi-state SARE grant project directed by Tracy Leskey (Appalachian Fruit Research Station, USDA).

The UMass Fruit Team received funding from NIFA to conduct extension and research activities in fruit IPM (Multi-Level Extension Delivery to Support IPM for MA Vegetable and Fruit Growers; Hilary Sandler, project director). In 2017, there were seven growers at the "Mentor" level, receiving extensive IPM training throughout the growing season in tree fruit and small fruit IPM issues that they identified as major problems. Five other growers also participated in single issue "Partner Projects" in apples, raspberries, and cranberries. The project also supported weather station maintenance, our connection with NEWA, and grower training in use of decision support systems.

Five new UMass IPM fact sheets were published in FY17. *Blueberry IPM–Mummy Berry*, *Blueberry IPM–Witches' Broom*, *Raspberry IPM –Anthracnose*, *Raspberry IPM–Cane Blight*, and *Raspberry IPM – Spur Blight*.

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