Volume 21, Number 11. June 11, 2013.

Contents

Current degree day accumulations

Location: UMass Cold Spring Orchard, Belchertown, MA

	10-June, 2013
Base 43	914
Base 50	592

Upcoming pest events

Coming events	Degree days (Base 43)

Black cherry fruit fly first catch	702-934
Codling moth 1st flight peak	571-999
European red mite 1st summer eggs	447-555
European red mite summer eggs hatch	737-923
Lesser peachtree borer 1st catch	485-683
Oblique-banded leafroller 1st flight peak	826-1208
Redbanded leafroller 1st flight subsides	589-899
Pear psylla 1st summer generation adults present	737-885
Pear psylla 2nd brood hatch	967-1185
Peachtree borer 1st catch	789-1341
Spotted tentiform leafminer 1st flight subsides	674-956
Spotted tentiform leafminer 2nd flight begins	990-1162

Orchard radar apple insect key dates

Here are insect key insect dates from Orchard Radar, Belchertown, MA.

Codling moth (CM) 1st generation, first sustained trap catch biofix date: May 16, Thursday. Codling moth development as of June 11: 1st generation adult emergence at 67% and 1st generation egg hatch at 12%. In most orchards, insecticide targeted against plum curculio and apple maggot prevent codling moth damage. If targeted codling moth control is needed, key management dates are: 1st generation 20% CM egg hatch: June 14, Friday = target date for first spray where one spray needed to control 1st generation CM.

Obliquebanded Leafroller (OBLR) 1st generation OBLR flight begins around: June 8, Saturday. Where waiting to sample late instar OBLR larvae is not an option (= where OBLR is known to be a problem, and will be managed with insecticide against young larvae): Early egg hatch and optimum date for initial application of B.t., Delegate, Proclaim, Intrepid, Rimon, Altacor, Belt, pyrethroid or other insecticide effective against OBLR (with follow-up applications as needed): June 25, Tuesday.

Plum curculio (PC) earliest safe date for last PC insecticide spray: June 8, Saturday. If relying on repellance by Surround instead of PC mortality by insecticide, Surround coverage should be maintained until PC egglaying begins to naturally decline around Saturday, June 29.

Spotted tentiform leafminer (STLM) 2nd flight begins around: June 17, Monday. Rough guess of when 2nd generation sap-feeding mines begin showing: July 7, Sunday.

European Red Mite (ERM) Optimum monitoring period for 2nd generation ERM: Sunday, June

9 (nymphs hatched) to Sunday, June 16 (egglaying starts for 3rd generation).

Upcoming meetings

http://extension.umass.edu/fruitadvisor/upcoming-events

TUESDAY, June 11, 2013: Fruit Twilight Meeting, Tougas Family Farm, 246 Ball St., Northboro, MA. 5:30 PM. $20/25 meeting fee. 1 pesticide re-certification credit. Refreshments/light dinner will be served. No pre-registration necessary. Special Guest, Win Cowgill, Rutgers University. Horticulture and crop load management will be the focus of this meeting. A review of the thinning season, assessing set, hand thinning to final desired crop load, rescue thinning, and enhancing return bloom will all be topics. In addition, the orchard tour will include fruiting wall apples, quad-V peaches, and young cherry planting.

WEDNESDAY, July 10, 2013: Summer Meeting of the Mass. Fruit Growers' Association in cooperation with the University of Massachusetts Fruit Program, Honey Pot Hill Orchards, 138 Sudbury Rd., Stow, MA. 10 AM to 2:30 PM. For meeting flyer and registration info, click here: http://massfruitgrowers.org/2013/2013SummerMeeting.pdf

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The way I see it

Well, we are seeing the outcome of our apple thinning applications, and the hot weather of two weeks ago, and all I can say is it is a bit all over the place. I have seen very good crops of apples (that probably need additional thinning, see Late Season Rescue Thinning with Ethephon) and crops a bit on the light side. Blame bad pollination, over-cropping in 2012, up-and-down weather (aka THE WEATHER!), and over-zealous or untimely applications of thinning chemicals, IT IS WHAT IT IS! Usually the crop gets bigger as time progresses. Now we focus on maintaining clean and high quality fruit. Foliar calcium applications should have already commenced and be included in every cover spray. Summer disease season is already upon us, and it's time -- especially with this wet weather) to start including fungicides in cover sprays to control summer diseases. As cherries ripen they become very susceptible to brown rot. (And birds!) Watch for potato leafhopper, and for those who use targeted applications to control codling moth and oblique banded leafroller, well see Orchard Radar or NEWA and you will know exactly when to spray.

Insects

Potato leafhopper (PLH) has made or will be making an appearance soon -- scout young plantings and at the first sign of PLH, apply insecticide to protect the new growth.

Orchards that have a history of **codling moth (CM)** problems, this week will be the week to make sure you get a targeted spray on as eggs are hatching. Consult the 2013 New England Tree Fruit Management Guide, but Delegate, Altacor, Belt, Voliam Flexi, and Tourismo are all excellent alternatives to Guthion or Imidan if OP insecticide resistance is suspected. From the NEWA website: "Adult flights are relatively heavy during this period and the majority of eggs are likely to hatch, so control is critical at this time. Apply a second spray 10-14 days after the initial spray that was timed at first hatch, to provide protection during this critical time period. In high-

pressure orchards, it may be particularly important to apply other classes of materials to replace organophosphates or synthetic pyrethroids."

I've seen some undesirable **rosy apple aphid** in apple and **black cherry aphid** in peach. Hard to say if treatment is warranted at this point, they are harder to kill than if an earlier treatment window was used. Still, it may be worth considering an insecticide if bad enough, Movento is systemic and is probably one of the better choices at this point. (But would be hard to justify the cost on significant acreage, only spot treatment prescribed.) Consult the 2013 New England Tree Fruit Management Guide for other spray options.

I hope everyone (including your all your staff) is on the lookout for **Brown Marmorated Stink Bug (BMSB)** this year. Sooner or later, I am afraid, it is going to make a more significant appearance (i.e, economic injury) in Massachusetts peach and apple orchards. While out hand thinning or otherwise doing orchard chores, be on the lookout. This fact sheet from U. of Maryland will help you identify BMSB: http://www.pestthreats.umd.edu/content/documents/BMSBFactSheet_10-2010_000.pdf. Print some out so all your staff will know what to look for. I would appreciate knowing abou any potential sigtings/findings. (Picture would be helpful.)

Diseases

I suspect there has been ongoing fungicide application for **apple scab**, especially with this weather. If you have not sprayed fungicide in a couple weeks, however, and/or this wet weather keeps up for another week or two, fungicide application(s) should be made for **sooty blotch and fly speck**.

Brown rot could be a real problem with this weather in ripening cherries. Many fungicide options are available, including the new pre-mix fungicides such as Merivon, Luna Sensation, and Fontelis (not a pre-mix).

Horticulture

	Calcium should be included in all apple cover sprays and/or supplemental sprays now. Many cources of calcium are available, see Foliar Calcium Sprays for Apples for specifics. Very soon you should consider going on an ethephon or NAA program to enhance return bloom of apples in 2014. These sprays should start by mid-June, and either ethephon (Ethrel) or NAA (Fruitone) should be applied 3-4 times depending on cultivar and degree of bienniality. Consult Enhancing Return Bloom of Apples for details.

Hand thinning of both peaches and apples should commence ASAP and you know you have too many fruits (a given with peaches).

I see many young trees seriously damaged by herbicide application where trunk contact was made (picture on left). I urge all growers to protect trunks of first leaf tress before making a contact herbicide application. This includes using glyphosate (Roundup), paraquat (Gramoxone), and glufosinate-ammonium (Rely, if you can get it). Thanks to Mo Tougas and Win Cowgill for sourcing these inexpensive, milk-carton type trunk guards: http://monarchmfg.com/protectivewrapsshelters.aspx

Guest article

THE CAPTAN CONUNDRUM: SCAB CONTROL VS. PHYTOTOXICITY
By Dave Rosenberger, Plant Pathology, Highland; dar22@cornell.edu. Reprinted from Scaffolds Fruit Journal, Vol. 22, No. 12, June 10, 2013. http://www.scaffolds.entomology.cornell.edu/

Captan is a cornerstone fungicide for apples because it is very effective against apple scab and also controls summer fruit rots. Captan has long been noted for its ability to prevent scab on fruit even when scab control on leaves is less than perfect. In fungicide tests in replicated plots where we purposely used lower than recommended rates, Captan 50W at 3 lb/A has usually provided better control of apple scab than mancozeb fungicides applied at the same rate.

Fungi do not become resistant to captan because it blocks multiple biochemical pathways (i.e., it is a multi-site inhibitor). Resistance to captan can occur only if fungi develop simultaneous mutations for all of the blocked pathways, something that has not happened in the 60 years since captan was introduced.

Captan kills spores that it contacts, whereas many of our newer fungicides kill fungi or arrest fungal growth only after germ tubes emerge from the spores. As a result, when captan is applied in combinations with other fungicides in protectant sprays, captan usually does 90 to 99% of the work by killing spores on contact, thereby reducing selection pressure for fungicide resistance to the other product in the tank mix. We use tank mixes with other fungicides (dodine, benzimidazoles, DMIs, strobilurins, SDHIs) to expand the spectrum of disease control and/or to control/suppress the small amount of scab that may have escaped control from the last spray. Captan does not control powdery mildew or rust diseases, so tank mixes are needed to control those diseases even when captan alone might suffice for controlling apple scab.

Unfortunately, captan also has a dark side: it is toxic to plant cells if it penetrates into leaf or fruit tissue. Spray oil and other spray adjuvants that act as penetrants allow captan to move through

the protective wax cuticle on leaf surfaces. When that occurs, we see captan-induced leaf spotting, usually on the two or three leaves on each terminal that were just unfolding at the time trees were sprayed. It takes time for cuticular waxes to develop on new leaves, so young unfolding leaves are the most susceptible to spray injury. The leaf cells directly killed or injured by captan provide entry sites for other leaf spotting fungi such as Phomopsis, Alternaria, and Botryosphaeria than can enlarge the spots. It may take five or 10 days for the injury to become visible, and by that time the injured leaves may be 5 or 6 nodes below the growing point on terminal shoots.

the three weeks after petal fall because during that time period terminal shoots are growing very rapidly (i.e., producing lots of new leaves), and spray mixtures used at petal fall and in first and second cover sprays commonly include insecticides, growth regulators, foliar nutrients, and spray adjuvants. Captan applied alone almost never causes leaf spotting on apples. Rather, it is the other products in the tank that sometimes enhance captan uptake and trigger the resultant phytotoxicity. Increasing the number of products that are included in a tank mixture increases the probabilities that the mixture will enhance captan absorption and result in injury to leaves.

Early last week, we became aware that, under some conditions, spray mixtures that included Fontelis and captan were triggering unacceptable levels of leaf spotting or leaf edge burn. Because orchards showing injury were always treated with spray mixtures that included more than just Fontelis and captan, we lack definitive proof that Fontelis was the key contributing factor. However, the other products in these spray mixtures had previously been combined with captan without causing noticeable injury. In Quebec, Vincent Philion noted severe damage on Spartan apple trees sprayed with a tank mix of Fontelis-captan-urea under slow drying conditions. Urea in that mix may have exacerbated the captan damage, although urea-captan combinations have been used without incident in the past.

Following is a summary of our observations on injury associated with Fontelis-captan mixtures based on contributions from Vincent Philion in Quebec and crop consultants Jeff Alicandro and Jim Eve in Wayne County, New York:

1. Thousands of acres of apples have been treated with Fontelis-plus-captan combinations, and damage has been noted on only a very, very small percentage of the treated acreage.
2. Factors that seemed to increase the probability of injury were applications made under slow drying conditions (e.g., spraying at night) and applications that were made with low volumes of water (i.e., <100 gal/A).
3. Damage is primarily on leaves and is usually limited to a few leaves per terminal. In some cases, only occasional terminals show damage and the injury is very minor.
4. Cultivars vary in their susceptibility to damage, with the greatest damage being reported on Braeburn, Spartan (Acey Mac), Red Delicious, Empire, Gala, and Mutsu.
5. The unusually hot weather that prevailed throughout much of the northeast during the last few days of May might have contributed to the problem by favoring rapid terminal growth and/or by making trees more susceptible to damage via some other mechanism.

Although DuPont, the manufacturer of Fontelis, had run extensive trials to test the safety of Fontelis-captan mixtures, it is impossible to duplicate all of the tank mixtures that apple growers will ultimately use. Nor can test conditions ever duplicate all of the environmental factors that prevail during applications after products are commercialized. Thus, the discovery of occasional problems with Fontelis-captan mixtures is one of those unfortunate but perhaps unpredictable events that can occur in the process of commercializing a new product. Fontelis will remain an important apple fungicide for controlling scab and rust, especially during the time period when it

can be combined with mancozeb.

It is important to note that some pathogens cause leaf spotting that is very similar to leaf spotting caused by captan injury. Rust-induced leaf spotting occurs when cedar apple rust spores germinate on apple cultivars that are resistant to rust (Fig. 4). The invading rust fungus soon dies due to the host incompatibility reaction, but the cells killed or damaged by the germinating rust spores provide entry points for leaf spotting fungi. Rust-induced leaf spotting can be differentiated from leaf spotting due to phytotoxicity by the fact that rust-affected leaves usually show some bright yellow-orange pinpoint spots either at the center of lesions or at other locations on the leaves where the rust spots were not followed by secondary pathogens. Frog-eye leaf spot caused by Botryosphaeria obtusa can also cause severe leaf spotting, but distribution of this disease is very uneven within trees, with most infections occurring below over-wintering fruitlet mummies that supplied the inoculum.

Finally, pesticides other than captan can also cause leaf spotting and/or leaf burn. Sulfur and liquid-lime sulfur can cause damage when applied ahead of hot weather and/or if mixed with or applied close to oil sprays. Last year, Topguard fungicide caused a leaf-edge burn when applied to Cortland trees in my test plots that had recently been treated with streptomycin plus Regulaid. Topguard injury has reportedly been observed on Braeburn when sprays were applied with enough water to allow droplets to accumulate on leaf edges.

Defining the exact cause of phytotoxicity on apple leaves is often difficult. However, we know that special cautions are required when applying captan because it has a demonstrated record of causing phytotoxicity to leaves if oils, adjuvants, or carriers in other pesticides enable captan to penetrate into leaves.

Useful links

UMass Fruit Advisor: http://umassfruit.com

Scaffolds Fruit Journal: http://www.nysaes.cornell.edu/ent/scafolds/

Network for Environment and Weather Applications (NEWA): http://newa.cornell.edu

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UMass Vegetable & Fruit IPM Network (on Facebook, http://www.facebook.com/umassipmteam)

2013 New England Tree Fruit Management Guide (http://fruit.umext.umass.edu/2013netfmg/)

The next Healthy Fruit will be published on Tuesday, June 25 (in TWO weeks) or thereabouts, 2013. As always feel free to get in touch with any member of the UMass Fruit Team (http://extension.umass.edu/fruitadvisor/team-members) if you have questions or comments.