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UMassAmherst EXTENSION

Healthy Fruit

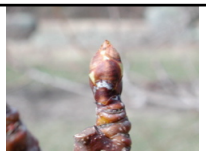
Prepared by the University of Massachusetts Fruit Program

Healthy Fruit, Issue 1, April 4, 2006

Current DD accumulations

Location	Base 43F	Base 50F
Belchertown, UMass CSO observed (01/01/06 – 04/02/06)	112	39
Belchertown, UMass CSO SkyBit (01/01/06 – 04/02/06)	103	NA

Current bud stages

Location	McIntosh apple	Honeycrisp apple	Pear	Redhaven peach	Cavalier sweet cherry
Belchertown, UMass CSO (04/02/06)	 silver tip+	 silver tip	 swollen bud	 swollen bud	 swollen bud

Upcoming meetings/events

Date	Meeting/ event	Location	Time	Information
April 11	Fruit Team Twilight Meeting	UMass Cold Spring Orchard, 393 Sabin Street, Belchertown, MA	5:30 PM	Jon Clements 413-478-7219
April 12	Fruit Team Twilight Meeting*	Mack's Apples of Moose Hill Orchards, 230 Mammoth Road, Londonderry, NH	5:15 PM	George Hamilton 603-641-6060
April 13	Fruit Team Twilight Meeting**	Dame Farm 94 Brown Avenue, Johnston, RI	5:30 PM	Heather Faubert 508-865-6706

Two pesticide re-certification credits offered at each Fruit Team Twilight meeting. Please be on time to receive credit

* In cooperation with New Hampshire Fruit Growers' Assoc.

** In cooperation with Rhode Island Fruit Growers' Assoc.

Make a note -- insect pesticide changes for 2006

Garnered from several sources -- particularly Lorraine Los from University of Connecticut -- here are some important changes in insect pesticide registrations for 2006.

- Abba 0.15EC (and FarmSaver Abba 0.15EC, both from Makhteshim-Agan of North America, Inc.) are new formulations of abamectin. Registered on apples, pears, strawberries, grapes, other crops. Similar use and crops as Agri-Mek.
- Imidan 70-W (Gowan Company) REI will change to 72 hours (now 24 hours). Both labels will probably be in field in 2006, and product with the 24 hour REI label can be used as such. But, watch for new labels as they appear.
- Guthion 2L (and Solupak, Bayer CropsScience) on peaches, nectarines, brambles, cranberries, and potatoes: distribution or sale of existing stocks of end- use products, is allowed until March 31, 2006. Use of the end-use products is allowed until September 30, 2006 so that growers can complete seasons. Guthion can still be used on apples.
- Assail (Cerexagri, Inc.) now also has a 30SG formulation; they will be phasing out 70WP.
- Couraze 1.6F (Cheminova, Inc.) has Imidacloprid as an A.I. It can be used on pome and stone fruit, with uses similar to Provado, i.e. leafhoopers, aphids, leafminers, psylla (on pome fruit), adding plant bugs and Japanese beetles to stone fruit.

A Dry Spring So Far -- D. Cooley

At the Cold Spring Orchard last week, I was wandering through our new grape planting and decided to check out the Marshall Macs next to it, and much to my surprise, they were at silver tip! Well, not too much of a surprise, but it has seemed like a warm spring. In fact, I think it was just a dry March.

In fact, rather than our usual 3 plus inches of rain (or foot of snow, as the case may be) during the month, we got about 0.5 in. That has a few implications in terms of apple scab.

Early Season Copper. For one thing, it makes it easier to get through the orchard. Easy travel through the orchard allows **a dormant cover spray**. This primarily knocks down fire blight inoculum. In blocks where fire blight was present, or in nearby, a dormant application of fixed copper is a must. Bordeaux mix can be used, but fixed copper is more convenient. It comes in several formulations and from several companies. Copper oxycholorid and copper sulfate (COCS), copper salts with organic acids (Tenn-Cop), copper hydroxide (Kocide 2000, Champ), or complexed copper sulfate (Cuprofix Disperss) are examples of common fixed copper products. Apply them as dilute as is practical. While dormant to silver tip applications are safest, copper can be applied to quarter-inch green. After that, there's a risk of damaging leaves. At the same time, green tip applications of copper will provide a week's worth of scab protection.

Leaf Shredding and Urea. Apple scab management at this time of year is all about managing primary infections. These infections, we know, come from ascospores that are in leaves that were infected the previous year. One way to get a good estimate of how much risk of early scab there is in a block is to do something last fall – measure the potential ascospore dose or PAD.

But it's a safe bet that most growers have not had a PAD evaluation. So, it's a good idea to cut the risk of scab by **shredding leaves, or applying urea, or doing both**. Orchard floors are now dry and conditions are excellent for doing this. Several years ago Bill MacHardy and Sam Sutton showed that if you could shred old apple leaves on the orchard floor and apply urea, you could greatly reduce scab risk. If all the leaves could be chopped, including the ones under the trees in the row, then the risk drops by 80 to 90%. If the leaves under the trees can't be reached with the mower, leaving about a third of them in the orchard, but the rows are chopped, it still reduces scab risk by 50 to 65%.

Urea should be applied at 40 lbs. of urea fertilizer in 100 gal. of water per acre. The application should target leaves on the ground, so spray with the lower nozzles of an airblast sprayer aimed down, or use a boom sprayer.

Why bother with this? There are a couple of reasons. For one, if a mistake is made during scab season, like the wind is blowing and coverage at the tops of trees is poor, then the chances of infection are a lot less where the inoclum has been cut. Another reason is that the pressure for resistance development is much less if there is less inoculum. Anything that can be done to reduce the chances of resistance development will prolong the useful life of fungicides in a block. Shredding leaves is highly recommended in all blocks, but particularly where scab was a problem last year.

Ascospore Maturity. Apple scab ascospores mature largely as a result of temperature. For our purposes, scab spores start to mature when McIntosh buds are at green tip. More precisely, the model predicting ascospore maturity starts when 50% of the McIntosh buds in an area are at green tip.

After that, development depends on degree days. That is, "heat units" are accumulated by the fungus, pushing it's growth, the same way warm weather pushes the growth of apple trees, and cool weather slows their growth. For the scab ascospore model, each day an average temperature is calculated using the high temperature and the low temperature for the day. Then a base temperature is subtracted from the average temperature. In this case, the base temperature is 32ºF. One way of thinking about that is to say the fungus doesn't grow below freezing. So, if the high for the day is 60ºF, and the low that night is 28ºF, then 60 +28= 88, and 88 divided by 2 is 44. So, the average temperature is 44. Subtract the base, 32, and you get 12 degree days for the day. Each day, starting at McIntosh green tip, to use the model, a person calculates degree days, and adds them to the previous total.

The table below shows some key points in primary scab season. The most critical stages of the season go from about 215 degree days to 740 degree days, generally tight cluster through late petal fall or early fruit set. That's when most spores are released. However, spores are released earlier, just not that many. If there's a lot of scab near a block in wild or abandoned trees, or there was scab in a block the year before, then the early season is just as dangerous as the period after tight cluster. It's a good idea to keep this in mind when considering fungicide alternatives.

Degree days and scab ascospore maturity

Degree-days	Cumulative Ascospores Mature (%)	Range for Estimate	Approximate Apple Growth Stage
35	1	0 - 7	half-inch green
110	3	0 - 14	
145	5	1 - 19	
215	10	2 - 32	tight cluster
325	25	7 - 55	pink
450	50	21 - 80	bloom
575	75	46 - 94	
685	90	69 - 98	petal fall
740	95	79 - 99	early fruit set
790	97	86 - 100	
865	99	93 - 100	

Fungicide Alternatives. Resistance is driving a change in fungicides, away from the sterol inibitors (Nova, Rubigan and Procure), back to older standbys. In the early season, growers could in past years ignore the low risk, and use SI's to stop any early-season infections. But the scab fungus is developing resistance to the SI's. New fungicides, the strobilurines Flint and Sovran, and the anilinopyrimidines Vangard and Scala, are systemic and can suppress infections after they start, but they do not act like the SI's. And the fungus can quickly develop resistance to these materials as well.

Early in the season, the best fall-back is probably to use some combination of the EBDC fungicides (Dithane, Manzate, Penncozeb, Manex, Polyram), captan and dodine (Syllit). While these fungicides are excellent against apple scab, they are less forgiving than an SI program. The EBDCs and captan are protectants. For practical purposes, they need to be in place before an infection period happens. That means starting early, to protect against any early scab infections. And it means maintaining the protection through primary season, re-applying approximately every week.

Dodine is a systemic, and can be an excellent post-infection scab fungicide in the early season. While resistance to it has been found in many orchards in nearby states, it has not yet been confirmed in Massachusetts. Syllit is an excellent protectant, and also can stop infections that may have started. It does this primarily by working as a fungicide that stops spore production. Early-season, in orchards without a lot of Syllit use, it's a good choice.

Peaches. At this time of year, don't forget leaf curl. This disease can be controlled by fall or dormant spring applications of an appropriate fungicide. After buds open, the efficacy of these sprays rapidly decreases.

In addition to the apple blocks, coppers are a good choice in the peaches for leaf curl. COCS, Kocide and others should be applied at rates for leaf curl recommended on the label. In addition, chlorothalonil, as Bravo or Echo, is a good material:

Bravo Ultrex 82.5 WDG	0.9 to 1¼ lb per 100 gal.
Bravo Weather Stick 6F	1 to 1.4 pt. per 100 gal.
Echo 6F	1 to 1.4 pt. per 100 gal.
Echo 90 DF	¾ to 1.2 lb per 100 gal.

Both Ferbam and Ziram are also good leaf curl fungicides.

Ferbam 76 WDG	1½ lb per 100 gal.
Ziram 76 DF, 76 WDG	1½ lb per 100 gal.

Cornell 2006 Commercial Tree-Fruit Production Guidelines on-line

We are recommending growers use the Cornell 2006 Pest Management Guidelines for Commercial Tree-Fruit Production, available on-line at:

http://www.nysaes.cornell.edu/ent/treefruit/

(You can also order a hard-copy of the publication at: http://store.cce.cornell.edu/index.html)

Keep in mind the New England Apple Pest Management Guide has not been fully updated since 2003. The Cornell Guidelines are up-to-date, and include stone fruit (peaches, cherries, plums) as well as apples. The only caveat is New York may have some pesticide uses registered that Massachusetts does not (or more likely, vice-versa). You can rely on your agri-chemical sales representative to give guidance on that matter. Otherwise, the Cornell recommendations are very good and comprehensive.

FREE Agricultural Pesticide Disposal Events

There will be a series of free pesticide collection and disposal events for agricultural operations, including nurseries, over the coming year. All events are funded by the Department of Agricultural Resources through a grant from EPA.

The first events are scheduled as follows:

- **Saturday April 22nd at Smith Vocational School in Northampton**
  For more details and to pre-register, agricultural operations must call the Northampton Department of Public Works at (413) 587-1059
- **Saturday, May 6th at the Town of Orange Transfer Station.**
  For more details and to pre-register, agricultural operations must call the Franklin County Solid Waste Management District at (413) 772-2438.
- **2006 Cape Cod**
  There will be at least twenty events on Cape Cod running from May 13 to October 28 where agricultural operations can dispose of pesticides. Events are also open to growers from off the Cape. For details, please call 1-800-319-2783 or 508-375-6699 or go to http://www.capecodextension.org/agpest/

The Department is working to open up additional opportunities for growers in other parts of the state later in the year. Details to follow at a later date.

Department Contact: Gerard Kennedy at 617-626-1773.

Guest article

Reprinted from SCAFFOLDS Fruit Journal, Geneva, NY, Volume 15, No. 2, March 27, 2006

IN A PEAR TREE

(Art Agnello, Entomology, Geneva)

Growers have been having a bit of a rough time with pear psylla recently (like last season), and this is a pest that is synonymous with a kind of double jeopardy - that is, biological difficulty in controlling the populations because of their penchant to become resistant to many insecticide groups, as well as economic difficulty in justifying some of the more effective ("$$pecialty") materials because the crop usually isn't worth that much. This brings us to the poor man's best recourse - pre-emptive action using something inexpensive. I'm referring, of course, to early season oil applications, and maybe even multiple sprays in a given block, weather conditions allowing. We're not quite there yet, because the early spring temperature outlook still appears to be somewhat lower than normal, so there are likely to be still a few frost-prone periods, but I'm assuming that the milder than normal winter will usher in a similarly moderate spring, and that the daily low temps will soon climb out of the danger zone. (Actually, this is just part of a ploy I'm trying this year to promote more oil use in general, given the increasing problems we've also seen with San Jose scale, but we'll cover that one in another issue). So, as a means of getting you to start thinking about your pear pest strategy, I'm re-running the facts on two insects of interest (only Pear Psylla included here):

Pear Psylla

Originally introduced accidentally from England into Connecticut about 1832, the pear psylla has 3-4 generations a year, depending on the length of the growing season for the area. The overwintering adults pass the winter in litter on the ground or in cracks in the tree bark. On warm spring days, prior to the trees breaking dormancy, these adults can be found on the trunks, twigs, and branches. The first eggs in the spring are laid prior to bud burst, on the terminals and spurs. As the foliage appears and for succeeding generations, the eggs are laid on the new leaves. First egg hatch occurs about the time the foliage appears. The pear psylla is a "flush feeder", meaning that the nymphs feed and develop primarily on the newer, more tender growth. By midway through the growing season, the majority of leaves are hardened off and psylla development then may be limited primarily to the water sprouts.

Once the nymph begins to feed, a honeydew drop forms over the insect; the psylla develops within this drop for the first few instars. Honeydew injury occurs when excess honeydew drips onto and congregates on lower leaves and fruit. Under bright sunlight and dry conditions, the honeydew can kill the leaf tissue and produce a symptom called "psylla scorch". The honeydew is a good medium for sooty mold growth. When it occurs on the fruit, it russets the skin and makes the fruit unmarketable. Excessive feeding and the injection of toxic saliva by large populations of psylla can cause a tree to wilt and lose its leaves prematurely. This reduces tree vigor, which can take the tree several years to recover.

Ladybird beetles, lacewings, syrphids, snakeflies, and predatory bugs have been

recorded feeding on the psylla. There are also two wasp parasitoids of pear psylla in the U.S. However, to obtain commercially acceptable fruit in New York, pear psylla must be controlled with insecticides.

Registered insecticides for summer use on pears are historically unreliable in controlling pear psylla for extended periods because of the development of resistance in psylla populations to materials that are initially effective. In addition, N.Y. growing conditions necessitate management practices for fruit size attainment (vigorous fertilization and significant canopy pruning) that are favorable for the rapid buildup of psylla populations. Contributing to difficulty in controlling psylla is the widespread use of materials for other pests that are destructive to natural control agents, such as pyrethroids and carbamates.

Current management recommendations call for prebloom oil applications to deter early egg-laying and early hatch, which may be combined with Esteem for added efficacy, and insecticide sprays to manage nymphal populations that build beyond 1-2 per leaf, starting anytime after petal fall and throughout the summer. Agri-Mek used shortly after petal fall had given good control if applied correctly (well-timed, adequate coverage, combined with an oil adjuvant), but this product's efficacy has been flagging lately. Dick Straub's trials in the Hudson Valley have shown the utility of split applications of Nexter or Provado, also starting soon after petal fall. Actara is another good in-season alternative for maintaining populations below damaging levels, and Assail, our newest neonicotinoid, has also given good results in some studies (at least initially). Regrettably, however, most of these in-season products are relatively expensive, especially if more than one intervention is needed, which it often is. Pyrethroids are quite affordable, but even new ones tend to have a short efficacy life, since psylla seem to have a knack for getting around their mode of action after about one exposure. This is further argument for doing your best to be pro-active early in the season.