



IPM News

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Disease Management Update

Apple Scab - At the five sites where we are tracking degree days, 900 DD were reached on:
UVM Hort. Res. Center — May 28
Shoreham— May 25
So. Hero— May 29
Bennington—May 24
Dummerston—May 22

The next daytime soaking rain following those dates when the temperature was at least 50F would have released the remaining ascospores. If that rain period also was an infection period, that would have been the last primary infection period. And, since 2 weeks have past from that probable last release of ascospores, what you see in your trees for primary scab is it. Now the focus is on preventing secondary scab if lesions are present. Keeping good coverage and a tight schedule with Captan would help to protect the fruit and foliage. Hopefully, everyone has been successful in managing primary scab this year.

Fire Blight - At all the sites that we were monitoring (i.e., Shoreham, So. Hero, Bennington, Dummerston, and So. Burlington) conditions were favorable for infection during bloom based on Skybit E-weather Service data and the Maryblyt computer program, Blight symptoms should be present in orchards if infection did indeed occur. At the Hort. Res. Center we have observed a few fire blight strikes on terminals. Since we are experiencing significant cuts in funds in the UVM Apple program and will not be able to visit orchards this season as we have in the past, I would greatly appreciate it if you would let me know if you do have fire blight symptoms — on what cultivars/rootstocks, how old the trees are, and if you had any fire blight last year. The “ugly stub” method for cutting out infected shoots is described on pages 22-23 in the 2003-2004 New England Apple Pest Management Guide.

Cankers, Herbicides, and Apple Tree Death - - Are they related? The following is an article that appeared in the June 14th issue of Scaffolds Fruit Journal. It is written by Dave Rosenberger and Mike Fargione of Cornell’s Hudson Valley Lab who are looking into the incidence of apple tree death in eastern NY to see if there is a relationship between trunk injury, herbicide use, drought stress, and infection of the injured trunk by the white rot fungus, *Botryosphaeria dothidea*. Again, I would be interested in hearing if you are seeing the tree death that Dave and Mike describe:

“Over the past five years, we have noted with increasing frequency a kind of trunk injury on apples trees that does not fit the description of any known disease. The injury usually occurs at or near ground level and extends 2-8 inches up the trunk from the graft union. Frequently the injury is confined to one side of the trunk, but in some orchards large numbers of trees are killed after trees become girdled. Bark on roots below the soil line and on the trunk above the cankered area remains healthy. The canker margin is usually rather distinct. In some orchards, cankers are most prevalent on the southwest side of trees, suggesting that winter injury may be involved. However, in other orchards, the injury may be more prevalent on the northern side of the trees. In eastern New York, tree losses from this trunk canker are becoming more common than tree losses from fire blight.

Most affected orchards have the following characteristics:

- o The orchards are well-managed with a very clean herbicide strip.
- o Trees affected are generally more than five years old with trunks at least three inches in diameter.
- o Severity of damage is often variety-dependent, with especially severe injury noted on Cortland and Macoun trees.
- o Affected orchards have received glyphosate (Roundup or generic equivalents) at least once per year.

At this point, we are just initiating research to determine the causes of this potentially lethal trunk canker. However, we are sharing our hypotheses at this time in hopes of minimizing further damage. We also encourage observers to contact us with other ideas, observations, and information.

Hypotheses for explaining herbicide-induced trunk cankers:

1. The trunk cankers result from hitting the lower part of the tree trunks with glyphosate sprays.
2. Stress within the glyphosate-sprayed bark may enable the white rot fungus, *Botryosphaeria dothidea*, to invade and kill the bark.
3. The glyphosate/*B. dothidea* interaction may be more lethal in trees that are under water stress when the glyphosate is applied as compared with non-stressed trees.
4. Cankers may not become apparent until several years after the injury that allowed canker initiation. Therefore, eastern NY growers noting cankers for the first time this summer may be seeing results of herbicide injury that occurred during the July-August drought of 2002.

Observational support for these hypotheses:

The patterns of injury on the trunks is often consistent with the exposure pattern that would be expected from an herbicide sprayer where the boom is adjusted to provide overlapping coverage in the line directly between trees within the row. The injury has been observed in orchards where only glyphosate and gramoxone are applied, so we can rule out residual herbicides as a potential cause. Gramoxone has a longer history of usage than glyphosate, and the trunk canker problem emerged relatively recently during the same time frame during which we suspect that orchard use of glyphosate was increasing. The extremely clean herbi-

cide strips in many of the affected orchards suggest late summer applications of glyphosate are common in the affected blocks.

B. dothidea is endemic in most older apple orchards where it commonly occurs in superficial cankers that cause little damage to the tree. However, *B. dothidea* can become aggressively pathogenic in drought stressed trees. When that happens, necrosis can extend into the inner bark. Thus, *B. dothidea* is commonly present in older apple trees but can cause serious damage only when trees encounter stress conditions. Perhaps glyphosate alone can cause the injury that we are seeing, but we suspect that in many cases glyphosate and *B. dothidea* are acting together.

Management implications:

Drastic changes in ground cover management are not warranted at this time because we still have no experimental evidence that glyphosate injury is at the root of the problem. However, if our hypotheses are correct, then the following precautions are worth considering:

1. Glyphosate applications made after July 1st may be more likely to cause injury than those made during May and June, because trees are more likely to be under stress conditions during summer and fall. Gramoxone may be a safer alternative for summer and fall sprays.
2. If glyphosate is applied during late summer or fall, the lowest effective rate of glyphosate should be used, contact with the tree trunks should be minimized, and sprays should not be applied during periods when trees are likely to be water stressed (i.e., during drought periods or on very hot days).
3. Read glyphosate labels carefully! Many different formulations are currently available, so anyone using 10-yr-old notes when adding glyphosate to their spray tank may be drastically overdosing their trees.
4. Whether using glyphosate or gramoxone, always include a drift inhibitor in the spray tank to minimize the potential for unwanted drift of small spray droplets.
5. Glyphosate should never be applied in orchards using controlled droplet applicators (CDA sprayers) because these applicators by definition generate small droplets that are prone to drift.

In summary, caution is advised when applying contact herbicides during summer or fall. Everything possible should be done to avoid contacting trunks with the herbicide sprays. Finally, we emphasize that the relationships between trunk cankers and herbicide injury or infection by *B. dothidea* remain to be proven. We will appreciate input from anyone who can contribute further information on occurrences and causes of the trunk canker problem in apples.”

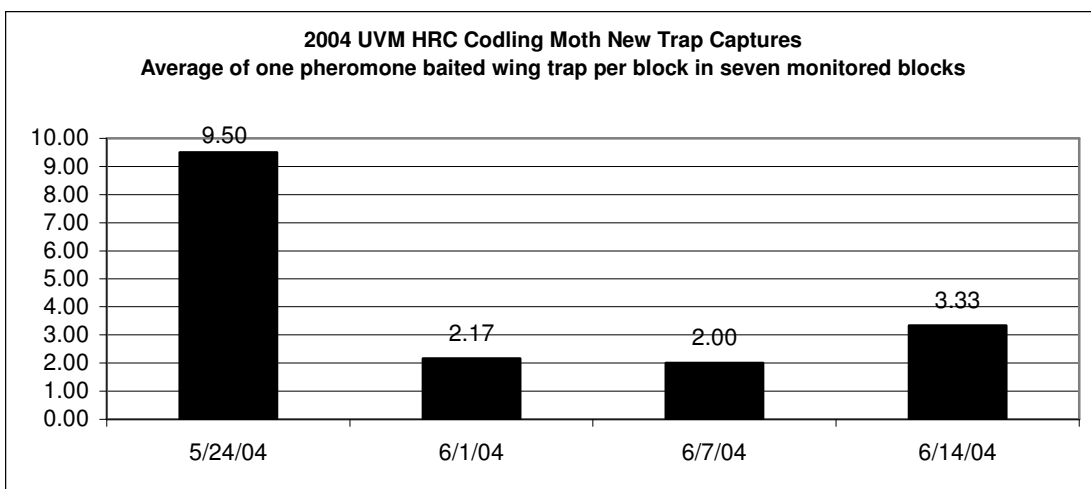
Arthropod Management Update

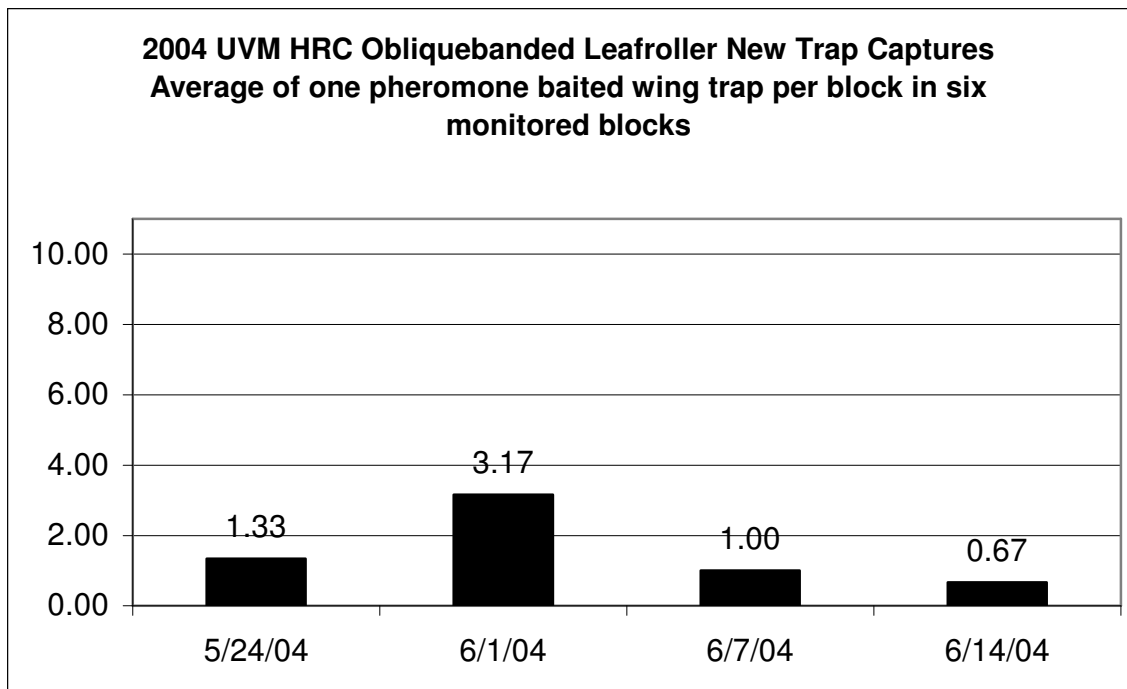
Plum Curculio - At 340 DD (base 50F) accumulation from 95% Petal Fall, it is estimated that 40% of oviposition is complete and PC are no longer moving into the orchard. Any PC that are within treated trees will have been killed and no additional sprays are necessary if 340 DD accumulate within 10-14 days after the last insecticide spray. The following table gives the estimated DD that have accumulated at the 5 sites we are monitoring:

2004 <u>Estimated</u> Degree-Day Accumulation (Base 50F, from 95% McIntosh Petal Fall) for Selected Vermont Sites ¹					
	So. Burlington (PF=5/17)	Shoreham (PF=5/14)	South Hero (PF=5/19)	Bennington (PF=5/15)	Dummerston (PF=5/15)
06/14	277	340	248	311	332

¹Degree Days received from Skybit E-Weather Service: <http://www.skybit.com/>

Codling Moth - As mentioned previously, there is a Michigan Degree Day (DD) model that helps to identify the most effective time to manage this insect. The model uses the first capture of codling moths as a 'biofix' from which DDs (base 50F) are accumulated. It is predicted that 3% egg hatch occurs when 250 DDs have accumulated. When population pressure is high, a spray applied at this time should be effective, followed by another application 10-14 days later. If pressure is not severe, one spray applied at 360 DD after the biofix date should manage the first generation population. As of June 14th, the following DD had accumulated from the first trap capture: Shoreham - 318 DD from May 15th
Dummerston - 394 DD from May 11th
South Burlington - 246 DD from May 17th (conservative estimate of first trap capture)





Oblique Banded Leafroller - Trap captures at the UVM Hort. Res. Center for the OBLR are graphed above. The optimal time to begin scouting for second generation OBLR is about 600 DD (base 43F) after the beginning of first generation moth flight. We will alert you when we approach that time.

European Red Mites - Middle-age fruit cluster leaves should be used to monitor ERM populations. Threshold for June 16-June 30 = 55% of the leaves have motile mites. So far, we have seen very few mites in orchards we have monitored.

Green Apple Aphids - Aphids are appearing on young shoots but so are the predators ! The threshold for action is when more than 50% of vegetative terminals are infested and predators are present on less than 20% of infested terminals, or 10% of fruit have honeydew or aphids on the fruit surface.

Apple Maggot Flies - Yes, it is time to start getting the AM traps ready. They should be placed in the orchard next week in blocks that have early ripening cultivars.

Looking Ahead... What can we expect to see in the near future?

The following two charts give where we are in terms of accumulated degree-days (base 50F) from Jan. 1 and what arthropod "events" should occur in the near future:

2004 Estimated Degree-Day Accumulation (Base 50F, from Jan. 1) for Selected Vermont Sites ¹

Date	So.Burlington	Shoreham	South Hero	Bennington	Dummerston
06/14	507	543	487	513	567

¹Degree Days received from Skybit E-Weather Service: <http://www.skybit.com/>

Arthropod 'Events' Based on Degree-Day Accumulation ¹

Pest/Phenology Event	Estimated DD Base 50 F for Event (from Jan 1)
OBLR - 1st adult catch, 1st summer brood	478-606
STLM - 2nd gen. 1st adult catch	558-742
SJS - 1st crawlers observed	619-757
AMF - 1st capture	746-1032

¹ Source of Estimated DD (Base 50F) for arthropod pest events: Pest Management Guidelines for Commercial Tree-Fruit Production 2003. A Cornell Cooperative Extension Publication, Table 14: "Degree-day accumulations (from January 1) corresponding to selected fruit phenology and arthropod pest events." <http://www.nysaes.cornell.edu/ent/treefruit/>



Time to clean and hang those AM traps !

Contact Information

A Commitment to Excellence and Service:

If you have any questions or want to arrange for an orchard visit regarding your concerns, please call or write.

For horticulture questions contact:

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