

NH Integrated Pest Management Newsletter

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Apple Maggot Situation

I set out my apple maggot traps on July 5th in Durham. I have two sites; the Kingman Farm (mVII trees, no insecticides for several years, McIntosh & Cortland), and the UNH Woodman Horticulture Farm (smaller trees, multiple varieties, about 3 acres total). Checking the traps at Kingman on the morning of the 7th, I found one AM fly already. Another was on the Kingman trap on July 12. That makes sense for a site where no insecticides have been applied for several years, and AM flies are emerging from the soil in the orchard. I don't expect to find significant numbers of AM flies at the Woodman Farm until very late July or early August. Even though it is only 1 mile from Kingman, we control insects at Woodman, so I expect no emergence there. Flies that reach those traps have to emerge elsewhere, and fly to the orchard. We have eliminated nearby untended trees, so AM numbers here are usually delayed and low. We'll see if this pattern holds for this year, as it has in recent years.

When Do I spray for Apple Maggot?

Basically, I'd recommend spraying when you have caught a cumulative average of over 1.0 AM flies per trap. That's assuming that you are using red sphere traps, without the added scent capsules that you can buy. I think that combination is the most reliable of our monitoring options for apple maggot. But wait... there's more.

If you have only varieties that mature with or after McIntosh, I've found that you can wait until July 30 to begin spraying, even if you catch (enough) flies earlier than that. This is NOT true if you have some early varieties. They will need treatment as soon as catches exceed threshold. Early varieties tend to be the ones the flies go to early. Quinte, Early bird, Red Astrachan, Vista Bella...

Paulared is a relatively early variety that doesn't seem to get bothered much by apple maggot.

Varieties With Most AM Injury

I've passed this on to you before, but it doesn't hurt to repeat here. In many years of apple evaluating, the highest incidence of Apple Maggot injury in NH has been in Cortland and Delicious. Out of 60,000 fruit I evaluated over 5 years, the incidence on Delicious was 0.19% (7,500 fruit counted) and on Cortland it was 0.13% (15,280 fruit examined). Northern Spy had a high rate (1%), but that was out of only 300 counted, so the numbers may not be statistically comparable. Gravenstein also had a high figure (0.47% injured) but very few fruit counted (210).

McIntosh had a much lower level than many. The rate (out of 26,920 fruit) was 0.04%. So far, I haven't seen apple maggot injury on managed Macoun, Empire, Paulared, or Mutsu. That suggests to me that the attack rate for them is low (and/or our control methods work well). I remember Ron Prokopy commenting that Gala seemed to be preferred by apple maggots. Perhaps I haven't counted enough of them yet to find much injury.

Bottom line? Delicious, Northern Spy and Cortland seem to get the most injury here, and Gala may be in the moderately preferred group. Yes, Red Astrachan is REALLY attractive, but they are long since picked when I do my evaluations, so they've never shown up in my data. I think Lodi is another early apple that is preferred. Early in the season, it tends to be early apples that are preferred, and late in the season it seems to be late varieties that are preferred.

Carl Majewski is First (again!) To Report Potato Leafhopper

Like last year, Carl was the first one to find potato leafhoppers in NH this year. I've only seen a couple, and his counts (in alfalfa) were also lower than last year's at about this time. George Hamilton reported that he has also found them, and has reports (various crops) of significant problems with them already. So it might be worthwhile for you to check your trees (especially young ones) if you haven't already. PLH attacks the shoots and suckers. The injury starts out as yellowing of the leaf edges, followed by necrosis, and stunting of the shoot growth. This is more serious on young trees than it is on mature trees.

Nymphs of PLH look very similar to nymphs of white apple leafhopper. You can tell them apart based on behavior and location. WALH nymphs tend to be on cluster leaves. When prodded, they tend to move backwards (or forwards, if prodded from the rear). PLH nymphs tend to be on shoots and suckers. When prodded with a finger, they tend to crab-walk sideways, with a quick, almost nervous pattern.

Don't Forget About Flyspeck

Once primary apple scab season ends, we tend to forget about pathogens a bit. If we do, we might have problems at harvest. Flyspeck is a fungal disease of apple that has MANY woody hosts. We think that brambles are among the more important alternate hosts. The fungus needs high humidity (not necessarily rain) to grow. The fungus needs to grow for quite a while before the spots appear on the fruit surface. But once they've appeared, the only way I know to remove them is with a peeler. So prevention is important. If you include a fungicide at least once every 30 days during the summer, that can help keep it under control. Not any fungicide will do. The New England Apple Pest Management Guide lists those with high activity for this fungus (see table 14, pg 88). Among the choices are: Topsin-M plus a protectant, Flint, Sovran, mancozeb, Captan, or Ziram. Ziram by itself or combined with sulfur can be effective, but they can leave significant residues on fruit at harvest. Remember that Mancozeb products have a long days-to-harvest interval; 77 days.

Leafminers are Flying in Apple Trees

Adults of spotted tentiform leafminer and apple blotch leafminer are flying now. You can find the brown (empty) pupal cases of the moths just sticking out of the corners (undersides of leaves) of the mines from which they emerged. They are laying eggs, and soon the very first of

the next generation of sap-feeding miners will become visible. This generation is not as synchronous as the last. In unsprayed trees (like those at the UNH Kingman Farm) parasites and predators kill many of the miners while they are still larvae. Last week at Kingman Farm, I found over 1/3 of the miners had been killed by parasites. At other (sprayed) orchards that day, I found few parasitized miners. Protecting parasites is one benefit of eliminating unnecessary insecticide applications.

When you check your apple maggot sticky traps, you may find leafminer moths on them. I found several when I checked AM traps Monday morning, July 12.

More on Fruit Lecanium Scale

I mentioned this earlier (issue #6), but though a follow-up note would be good. I received an apple twig from Vermont (thanks, Tom!!) that was just covered (!!!) with European fruit lecanium scale. I wasn't sure precisely when the crawlers would emerge, but the next day (June 30) the bag was **plastered** with crawlers. Crawlers are the just-hatched scales, the most vulnerable stage to insecticides. They are oval, dull yellowish, roughly 1 millimeter long, with tiny legs and antennae just visible. There were also some parasites emerging from the sample. I've seen European fruit lecanium scale on apple, mulberry, elm, honey locust, and blueberry. It must hit other things, too.

Raspberry Cane Borers Have Appeared

That's right. It didn't make the evening news, but the first double-girdled raspberry and blackberry canes are appearing now. The culprit is a black beetle with long, black antennae. Control: eliminate nearby unmanaged brambles, and prune out affected canes.

A few weeks ago, you might have noticed a few primocanes that wilted, with no obvious girdle. Eventually, a purplish mark appears at the girdle point. This is from raspberry cane maggot, a minor pest that typically appears in June, and has just one generation per year. The same management recommendations apply for this species.

Cyclamen Mites on Strawberry

Picking season is over for most NH strawberry growers, and renovation time is here. If you have had problems from cyclamen mites in your strawberry bed, the most effective time for treatment (by far!!) is right after renovation. High gallonage, a wetting agent, and high pressure (to get good agitation of the foliage that is there) are required for success. Thiodan EC and Kelthane 35WP are both registered for this.

Raise your hand if you remembered what cyclamen mite injury looks like. If not, read further. New growth arising from infested crowns is stunted, twisted, distorted, sometimes purplish. The mites themselves are REALLY small, and are found where the new foliage is forming—not out on the expanded foliage. I can't reliably find them with a 10X hand lens; I need my microscope.

Blueberry Maggots Are Out

Blueberry maggots are very much like apple maggot. In fact, for many years they were considered the same species. BM's are a bit smaller, but emerge at the same time, and have

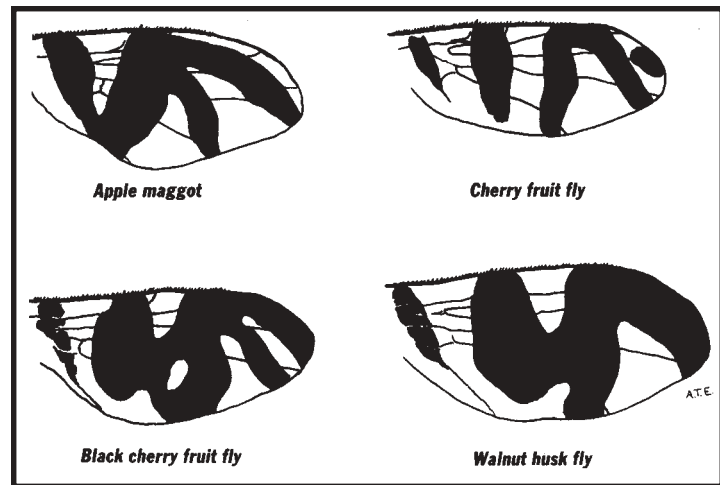
the same wing band pattern as apple maggot. The first of the blueberry maggots should be out, although I'm not trapping them this year.

They attack whatever varieties have turned blue. They are easy to monitor with traps, and control is also easy. Every few years, we have a really serious outbreak. The pattern seems to be that growers who never monitor for this insect (and never spray either) are occasionally hit very hard by serious infestations. I often hear about this via a public health nurse or other official who is investigating maggots (yuck!!) someone found in blueberries.

You can get all the details in my fact sheet "Using Blueberry Maggot Traps". You don't really want the health authorities calling you, do you?

What Do Apple Maggot and Blueberry Maggot Flies Look Like?

Here are diagrams of the wing bands of apple maggot, blueberry maggot (basically identical) and other relatives that we find on sticky traps set for them. The black band pattern is reliable to identify them. Those that get stuck on their belly side will show another feature that all the species in this group show: a white dot on the body, on the back (thorax), between the bases of the wings. I drew these many years ago by tracing the pattern under a microscope, so they are accurate.



UNH Woodman Horticulture Farm Twilight Meeting

Mark your calendar for August 4th, at 5:30 PM. That's when things will begin. Dr. William Lamont will be here, from Pennsylvania State University. He is Professor of Vegetable crops, and specializes in high tunnel crop production and plasticulture. Also on hand that evening will be several UNH staff who have work to show you or describe: Cathy Neal (Coop. Extension Specialist, Ornamentals), Cheryl Smith (Extension Specialist, Plant Health), Brent Loy (Professor, Plant Biology Dept. (cucurbit breeding), and John McLean, Manager of the Woodman Farm. There are several others of us who hope to fit it into our schedules. I think you will find it a very informative and interesting evening.

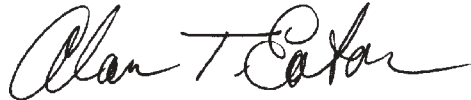
Leaf Testing For Nutrient Analysis

The first few days of August are the best time for taking leaf samples for nutrient analysis. You can get forms and instructions from your County Extension educator in Agriculture. Basically, you collect leaves, and from their nutrient levels, you learn what fertilization program should be followed for next year.

There is a \$22 charge for analysis, so if you turn in samples from 3 blocks that's \$66.00 (using Alan's simple math concepts). Basically you select the youngest leaves that are fully mature, and pick them (including petioles!!). Avoid leaves from trees with lots of injury, and

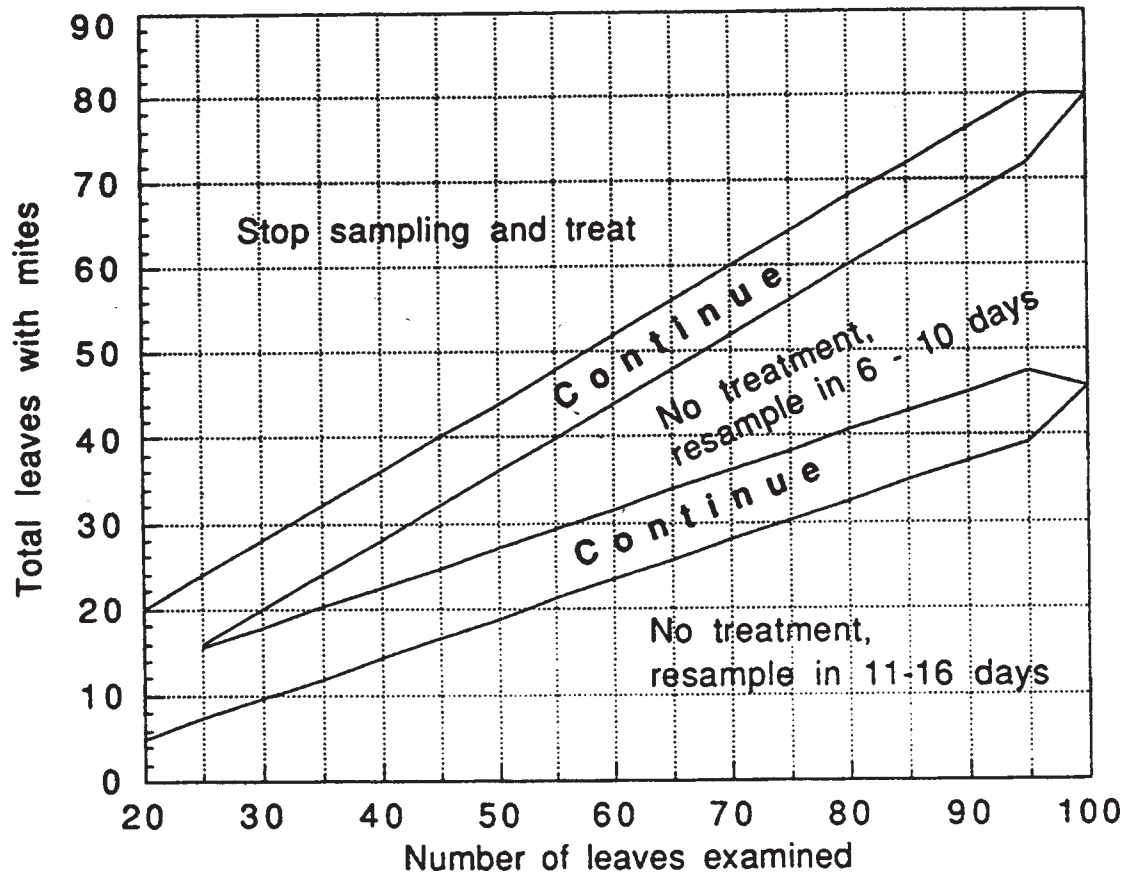
leaves that have recently been sprayed, or are covered with road dust. For tree fruit, pick 10 leaves from 10 trees across the block. Growers frequently place them in paper bags with ventilation holes, because the leaves need to be well dried out when they are submitted. We don't want fungi growing on them, and affecting things!

For small fruit, I understand that 75 leaves are usually needed. For Blueberries, its 150 leaves. For grapes, I think it is just the petioles that are used, but the forms and instruction letter will confirm (or correct) that. George Hamilton has just written and sent us the letter with all the details. Thank you, George!!

A handwritten signature in black ink that reads "Alan T. Eaton". The signature is fluid and cursive, with the first and last names being more prominent than the middle initial.

Alan T. Eaton
Extension Specialist,
Integrated Pest Management

Mite Sampling Chart - Threshold = 5.0 mites/leaf (July 15 - August 15)



* This procedure involves examining middle aged leaves for motile mites (any stage except eggs). Use this chart, which corresponds to a mite density of 5.0 mites per leaf, from July 15 until August 15. You will not be counting mites, but will only determine whether they are present or absent on each leaf sampled.

* Starting with a random tree and sampling every other tree, collect 4 leaves in a plastic bag from each of 5 trees, choosing from each quadrant of the canopy. To make sure the leaves are of intermediate age, pick them from the middle of the fruit cluster or foliar terminal.

* Using a magnifier, examine the top and bottom surface of each leaf for motile mites and keep track of the number of leaves containing motile mites. When all 20 leaves have been examined, compare this number with the decision lines on the above chart. If you are in either of the "Continue" zones, take more leaf samples in batches of 10 (5 per tree, for simplicity), adding the number with mites present to your original value while checking the chart again. Continue until you have passed out of the "continue" zone to arrive at a decision. If you reach "Stop sampling and treat", the population is above the threshold and a miticide application is recommended. If you reach one of the "Resample" zones, the population is below threshold, and should remain so for at least the number of days stated. Return as the designated time and conduct another sample. If "6-10 day" resample date falls during 7.5 mites/leaf threshold period, you can wait for a total of 11-16 days before resampling.

Modified from: Apple IPM; A Guide for Sampling and Managing Major Apple Pests in New York State. Agnello, A., J. Kovach, J. Nyrop, H. Reissig, W. Wilcox.