Plum Curculio

Plum curculio attacks should be over in most spots. An exception might be in the mountains or the far north. Typically attacks last three weeks, but this varies site-to-site. Organic growers using Surround will find that attacks last a bit longer, because that material doesn’t kill the curculios…it just protects the fruit from attack.

Potato Leafhoppers

PLH does not survive New Hampshire winters. The adults overwinter in the states bordering the Gulf of Mexico, and they fly back to New Hampshire (aided by winds) each year. I saw my first adults on apple trees on June 12th. The damage was obvious to me ... the foliage at the tips of shoots and suckers showed cupping and slight yellowing. Shoot growth will be stunted next, and some leaves will develop browned margins.
This isn't really a problem on trees of bearing age, because cluster leaves don't seem to be affected. For very young trees building a scaffold for the future, this can be a problem.

Both the nymphs and adults of PLH can be confused with WALH [white apple leafhopper]. Though they appear similar, the damage is different. WALH overwinters here, and the newly hatched nymphs are relatively easy to spot, on the undersides of cluster leaves, soon after petal fall. WALH nymphs and adults feed on the foliage, and create white stippling of the leaves. They also defecate on whatever is below them; leaves, fruit, insect traps, or your new car. They leave brown poop spots that wash off slightly with the rain.

Distinguishing the nymphs of the two species is based on their location and behavior. PLH nymphs are usually restricted to shoots and suckers. They are yellow-green, just like WALH nymphs. When you place your finger close to a PLH nymph, it usually makes a jerky retreat, sideways. WALH nymphs usually move forwards or backwards, without a jerky, quick response. They are usually on cluster leaves in the first generation, but sometimes are on shoot leaves in later generations.

Distinguishing the adults is based on color (unless you have a microscope... we can talk). WALH adults are whitish or slightly yellowish, with no color marks. PLH adults are yellow-green, and have a series of whitish marks on the upper part of head & thorax (see photo on page one).

Do you grow other crops? PLH hits potato, basil, & beans fairly heavily Damage can be serious. It also attacks alfalfa, eggplant, raspberry, cantaloupe and other plants. Are there any purists as readers? There is still another leafhopper on apples, that is similar to WALH. It is rose leafhopper, and looks and acts pretty much like WALH.

**Black Vine Weevil in Strawberries**

If you see this pattern of heavy defoliation on your strawberries, it may mean that significant damage has already occurred below ground, to the roots & crowns. Look closely, and see if you see lots of notches chewed on the leaves, from the edges, not holes in the middle of the leaves. The notching is starting right now. If you see this notching and there are no obvious leaf-chewing insects on the foliage, take a minute or two to look underneath the mulch and dig slightly into the soil, in the vicinity of the heaviest damage. If you find some dark gray weevils, you have probably found the culprit.

There are actually three very closely related weevils that do this here, and all are active at night, and hide in soil or leaf litter during the day. The biggest is the black vine weevil (the one that causes the greatest amount of damage), is about 3/8 inch long. Next down in size is the (uncommon) rough strawberry root weevil. The smallest is the strawberry root weevil...lesser of three weevils.

All three show a genetic curiosity: all individuals are female, so they do not need to mate to be able to
produce eggs. The adults begin emerging about the end of June in Durham. They remain in the strawberry bed, feeding on leaves for about a month before they begin laying eggs. Since every individual is a female, an infestation can begin with only 1 insect. This brings me to curiosity #2: the wing covers are fused, so they cannot fly. This means the way they reach your strawberry bed is either to walk there, or be carried (in infested crowns, soil, plants). In a very mild winter, some adults may survive in protected areas, to continue attacking and laying eggs. Larvae of all three of these species are white grubs which lack legs. Usually, larvae are at their largest (and damage is greatest) in May/early June. I won't show a larval photo now, since the vast majority have transformed to pupae or adults by now.

Controlling Black Vine Weevil (Strawberries)

Controlling BVW can be difficult. Brigade is registered for controlling the adults. It does kill them, but not as well as we might like. Using it can trigger very serious mite problems, by killing predator mites. I have seen cases in NH where it took more than one year to recover from two-spotted spider mite problems that resulted from Brigade use.

Another option is to use insect-killing nematodes. It is tricky and expensive. Mid-May seems to be the ideal time to try this, with early to mid-September almost as good a time. Applying nematodes is not like spraying chemicals. Because the nematodes are live organisms, you need to follow several extra steps to make things work. 1) use the correct species of nematode 2) triple rinse the sprayer before adding nematodes 3) check the viability of your nematode shipment before dumping them in the tank 4) Use the correct rate (yes, it is really high) 5) remove screens in your sprayer 6) agitate the tank continuously, so the nematodes don’t settle to the bottom 7) use relatively low pressure 8) apply in evening 9) moisten soil, and 10) once placed in the tank, apply the nematodes right away... they'll drown if you take a dinner break then!

The species to use are either Steinernema feltiae, Heterorhabditis bacteriophora or Heterorhabditis megidis. Other species are not good choices, since they behave differently. Check viability of your shipment by placing a small blob of the nematodes in a shallow see-through container, with a little water. You might put just a small pinch of table salt in the small container of water. It helps activate them. What you should see (you'll need a 5 or 10X hand lens) is lots of wriggling, curved nematodes. Sometimes it takes a minute or two for them to activate. If lots of the nematodes are relatively straight and not moving, then they are dead or nearly so. Call your supplier right away, and negotiate a replacement.

The correct rate for Steinernema feltiae (I'll call it SF) is 3 Billion per acre. Yes, Billion. For the other species (HB) 1 billion per acre is the rate. Prices and shipping costs vary widely between suppliers, so it really helps to shop around for a good rate, and check internet for sources. I'm frustrated by some suppliers that offer a mixture of species, but don't say what the ration of species is in the mix. You need
that information, to figure out if you are applying things at the correct rate.

Screens & agitation: The fine screens in sprayers are designed to keep larger particles from reaching the nozzles. But spraying tiny pieces of nematodes does no good. Remove all but the very coarse screens. Evening is the best time to do this, because the nematodes dry out (= die) quickly if the soil isn't moist. If the soil is really dry, you may want to moisten it a little bit, with your irrigation system just before applying the nematodes. Depending on how dry things are, it may be a good idea to turn it on again, briefly, after application.

A third option to control BVW & relatives is the “scorched earth” method. Disk up an infested bed, and replace it with crops that BVW larvae can't live on. Keep it in this unfavorable crop for over 1 year, before going back to strawberry. Don't forget to control the weeds on the site; several of them are good hosts for BVW larvae. Here's a list of BVW hosts. There may be more: Achillea, Asters, Astilbe, Azaleas, Begonia, Bergeania, Blackberry, Calla lily, Cinquefoil, Cyclamen, Dandelion, Dock, Epimedium alpine, E. grandiflora, Ferns: Adiantum & Christmas fern, Hemlock, Heuchera, Hosta, Hydrangea, Impatiens, Isoloma, Lily of the Valley, Lythrum, Mountain-Laurel, Phlox, Physostegia, Plantain, Primrose, Raspberry, Rhododendron, Rhubarb, Sedum acre, Strawberry, Sheep sorrel, Wood sorrel, Taxus (yew).

Blueberry Fruit Fly

George Hamilton and spent three years monitoring blueberry fruit flies, comparing efficacy of the different traps, and writing the fact sheet Using Traps to Monitor Blueberry Fruit Fly in New Hampshire. Then SWD came along, and changed things somewhat. But even though SWD has gotten the lion's share of the attention, BFF can still be a problem. The period of greatest risk for BFF is roughly July 1 to 15, just before we expect SWD to attack. If you have had problems with this insect in the past, it is worthwhile to set out a trap or two to monitor what is going on. The traps for BFF are NOT effective to monitor SWD. BFF traps should go up about July 1st, and for most sites, they can come down at the end of July.

Apple Maggot

AM is a close relative of blueberry fruit fly. Until the 1960’s BFF was considered a strain of apple maggot. That's how close they are in appearance and biology. AM numbers vary tremendously from site to site, and the pattern is different as well. In some orchards, attack begins about July 1-5, and in others it doesn’t commence until August. I still don't understand why more NH apple growers don't rely on the red sticky spheres to monitor AM. The traps are relatively easy to set up, they are reliable, and can save you a lot of money in spraying. They can help you avoid spraying an insecticide when the flies are not in significant numbers, and they'll help you avoid getting a nasty surprise of infested fruit. For a few minutes of work each week, some growers could literally save thou$and$. 

Red spheres should be hung at about head height, within 18” of fruit, yet still highly visible. I put most of mine in trees at the perimeter of the orchard, but if you had bad AM problems last year, you may need to put some in the interior as well. I hang mine about July 1-4, and I cover them with a thin coat of tangletrap or bird tanglefoot. You only need a few traps to predict what's going on in your orchard.

Then I check them at least once a week. I search for the flies, which I identify two ways. 1) there’s a tiny white spot on the back (thorax) between the wings 2) the wings have a black “F” marking that looks exactly like my illustration below. The bands for BFF and AM look virtually identical, but the flies are
slightly different in size. AM is slightly larger, about 5-7mm long (roughly 3/16 inch). I write the numbers down, and remove the flies as I count. If I catch an average of 1 AM fly or more per trap, it is time to apply an insecticide. At the end of the season, I bring the traps in, and store them in a heavy plastic bag (keeps out dust). When I'm ready to use them again, I scrape off as much of the old tangletrap as I can. If the sphere still looks dirty, I wipe it off with an old rag. Then it is ready to place in the tree and apply a fresh coat.

**Spotted Wing Drosophila**

Reports from my colleagues in Connecticut show that the first SWD's were trapped there recently, only 1 or 2 days from the same date as last year. That and other observations suggest to me that we'll probably see attacks that closely mimic last year's calendar timing. But please note that crops are not ripening at the same calendar date as last year, so we might see different damage patterns on crops this year. As I write this paragraph (June 24th) we are setting up our traps now in strawberries and cherries, and as soon as Bluettas and Early Blue blueberries turn color, we'll put some there as well. This insect attacks ripe and ripening fruit, so I see no reason to set up traps in unripe fruit. I modified my trap recommendations in April, and after comparing notes and research results with colleagues in New England, I've modified them again. You can read the details in the IPM section of our website. The photo of sorry-looking blueberries from our UNH patch last year will hopefully remind growers what could be in store, if they don't monitor with traps.

To briefly describe our spray recommendations: 1) set up traps in your susceptible crops, and check them at least weekly (I think every 4-5 days is better). 2) If you trap one or more male SWD's (look for the single dark spot near the tip of each wing) and your crop is ripe, I suggest applying an insecticide to control the flies. 3) I suggest coordinating trap emptying/checking with spraying: change the traps immediately before or soon after you spray. Then, check the trap 3 to 5 days later, to see if you are catching more or not. Most sprays we use should control the damage for about 5-7 days. If the catch continues past the period it has been protected, and the crop is still being harvested, spray again. The pesticide list on the website gives you some idea of the spray options and their efficacy. The pesticide labels keep changing! Rotate pesticides between different modes of action, so resistance is less likely to develop.

Speaking about pesticides, there is a NH label for a Cheminova formulation of Malathion, on blueberries. It has been approved for a higher than usual rate (so it is more effective than other products, which must be used at their (lower) labeled rate. Because of this, you can make fewer applications per season, but it gives you another material that works on SWD, to rotate with the few other effective insecticides. I don't know how long into the future this new label will be available, but we worked to make it an option for you NOW. Cheminova's 57% EC with highbush blueberry label is SLN NH-130002. The lowbush blueberry label is NH-130001.
Bird Problems in Fruit

I'm already seeing and hearing about cedar waxwings in strawberries. The one in my photo was pecking at an unseen berry at its feet. I expect I'll hear about birds attacking cherries shortly. My bird management publication should help you understand the options. In case you have a serious problem you can't seem to control, remember that the USDA Wildlife Services people [603-223-6832] can be extremely helpful. In a few situations, they might authorize lethal controls. I do not have the authority to do that.

Raspberry Cane Borer

In summer, the tips of some primary raspberry canes wilt. This often occurs in July, and close examination reveals a double girdle near the tip. This is the egg-laying scar of raspberry cane borer, a black, elongate beetle. I do not recommend spraying to control this insect. Control it by 1) eliminating nearby unmanaged brambles and 2) pruning out infested canes, either soon after wilting and a bit below the lower girdle or later on, by pruning out the entire cane. It is unusual to see heavy damage from this species. You can read more in my fact sheet, Raspberry Cane Borer, for more information. If the insects cooperate, soon I'll have new photos for it.

Vole Management and Rodenticides

I've had several apple growers ask questions, so I'll provide a little more information than I could at the last tree fruit grower meeting. I have re-written and significantly lengthened my old publication on management of voles in orchards. In addition to adding high quality color photos, it will cover orchards and highbush blueberry plantings. I sent the manuscript to my colleagues at USDA for review, but since that time I've become aware of a disturbing pattern. I don't usually see wildlife research journals, but in recent years there have been many studies that point to serious problems with secondary poisoning of predators (especially raptors) from rodenticides. The problem seems to be greatest with the second generation anti-coagulants, such as brodifacoum. With anti-coagulants, death does not come immediately after ingestion of the bait. With most such toxicants, it requires repeated feeding. An animal that is starting to feel the effects might be easier for predators to catch. My first look at some of these research reports suggests a rodent might have enough of the toxicant in its body to kill several raptors. I'm amazed at what I'm learning... even mountain lions have been found with residues or blood chemistry signatures of rodenticides. EPA recently responded to the problem by eliminating most second generation anti-coagulant rodenticides targeted for use by “homeowners”. More changes might be coming.

So I intend to read and digest more of these reports, and will be reporting to you (as users of rodenticides in and around agricultural buildings, and in orchards, nurseries, blueberry plantings). This could include changes in extension publications, notes in my newsletter, presentations at meetings, or other methods.
Fruit-related Meetings

Monday July 8. **Mid-Season Crop Scouting in Forages and Vegetables** at the Grafton County Farm, Grafton County Complex, 3855 Dartmouth College Highway, North Haverhill, NH 03774. 5:00 to 8:30 PM.

Wednesday July 10. **Air Blast Sprayer Calibration & Demonstration** at Apple Hill Farm, 580 Mountain Rd, Concord, NH 03301. 1:00 to 4:00 PM.

Wednesday July 10. **NH Tree Fruit Growers’ Dinner & Twilight Meeting** at Apple Hill farm, 580 Mountain Rd, Concord, NH 03301. 5:15 to 7:30 PM.

Wednesday July 17. **Fallow Management and Tunnel Selection on an Organic Farm**
Blue Ox Farm, 842 Shaker Hill Road, Enfield, NH 03478. 5:00 to 7:00 PM.

Alan T. Eaton
Extension Specialist
Integrated Pest Management

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