Late blight has been confirmed from samples on all sides of us in the last week, and Cornell pathologists suspect that inoculum is present everywhere now. This means it is only a matter of time before we start to see late blight in our area, and we recommend tightening up your protective spray schedule so that your tomatoes and potatoes are protected before and after all rain events, and at a 7-10 day interval when it is not raining. We will continue to update growers on the status of this damaging disease in the Capital District, and we are always willing to check on your samples if you suspect that you have found late blight on your plants.

Last week and early this week we made visits for possible late blight symptoms on tomatoes. We did not find late blight, but another disease that can resemble it. It is called Zonate Leaf Spot (Cristulariella moricola) and it occurs sporadically in the area. The key difference is that zonate leaf spot tends to be very “wet” in appearance compared to late blight and it does not sporulate quite like it either. It has a very pronounced “bull’s eye” pattern and the centers tend to drop out. It can appear on young and old tissue. In deciding if you have zonate or late blight, consider what plants are growing in the hedgerows around the fields. Zonate has lots of hosts, but the most popular tend to be boxelder and black walnut. It is believed that these infected trees are probably the source of inoculum for infection of the tomatoes. Although the infection can be severe, there are no specific recommendations for the disease control. However, protectants like copper and Bravo should provide some incidental control. –CLS and CDB

Hail Damages farms in Western Capital District

Parts of Montgomery County received some large (1 5/8”) hail with the storms on Monday, and with more severe storms forecast more farms in the region may also experience hail events. If you do receive hail, remember to protect plants that you plan to salvage with a protectant fungicide to reduce secondary infections and give them a shot of fertilizer through the drip if possible to jump-start regrowth. Plants can withstand significant leaf stripping, and those with quickly maturing fruit like zucchini can bear fruit again in a matter of weeks. If you want us to assess the damage after hail, we are happy to do so. –CLS
Growers around the region seem to be doing a pretty good job of scouting their cucurbits, and while we haven’t found downy mildew yet there have been some look-alikes spotted. One of the more interesting finds this week were very heavy populations of spider mites on summer squash. The damage from their feeding left bright yellow spots on the leaf surface which, from a distance, did resemble DM. Upon closer examination the undersides of the leaves were absolutely coated in spider mites!

We received reports of spider mites on squash throughout the region, so it would be worth your time when looking for other issues to flip the leaves and check for this pest, too. Though very difficult to see with the naked eye, spider mites are visible with 5-10X magnification, and they make the underside of the leaf look dusty and/or webby. If we continue to have stretches of hot, dry weather, we might expect spider mite populations to continue to increase and summer squash and on more traditional crops like eggplant.

Broad spectrum insecticides often do not work on spider mites because they are not a true insect. In fact, broad spectrum insecticides may suppress insects that feed on spider mites, leading to an outbreak. Conventional growers should use mite specific products such as Acramite 50 WS and Agri-Mek 0.15EC. Note that Agri-Mek has a 7 day PHI and would therefore not be a good choice for actively producing summer squash. Organic growers should focus on cultural controls such as limiting dust, and should avoid killing off natural enemies of spider mites. Crop oils are labeled for control of spider mites, though their effectiveness is not well documented.

**Beneficial Insects to Know and Love**

Did you know that only about 1% of insect species are pests? The rest are either beneficial or just passing through your fields. That’s why it’s important to be able to accurately identify beneficials as well as pests, so you don’t inadvertently wipe out a nice population of good guys that you’ve mistaken for bad guys. In this article I’ll describe some of the most common natural enemies and what pests they can help control in the field. All are naturally occurring, and some can also be purchased from an insectary and released.

**Lady beetles** are a common and widely recognized predaceous insect. The adults are often red with black spots, but some species are black with red spots, and one common species has a black and yellow checkerboard pattern. Both the adult and larval stage are predators. They overwinter as adults, emerging in early spring to feed on the nectar and pollen of early flowering plants. Adult females lay clusters of cream, yellow, or orange eggs on plant leaves, often near concentrations of prey. The black alligator-shaped larvae are less widely recognized that the adults, but are also predators on aphids, insect eggs, and newly hatched insects. Adult lady beetles may be purchased from insectaries and are most useful when released in a greenhouse situation.

The common **green lacewing** is native to much of North America. The larvae are aggressive predators, feeding on aphids, insect eggs and small larvae. Green lacewing adults are not predators, instead feeding on nectar and aphid honeydew. Adult lacewings are about ½-1 inch long, with long
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Weekly Update

Extreme heat can play havoc on tomato fruit that is just flowering or ripening, causing problems in fruit development due to poor pollination. Constant exposure of a tomato plant to high temperatures (day/night temperatures of 95/80°F) significantly reduces the number of pollen grains produced and released per flower and decreases the pollen’s viability. Most pollen is shed between 10:00 a.m. and 4:00 p.m. and 3-hours or more at 103°F on two consecutive days can cause fruit set failure.

Temperatures at night may play a more important role in determining whether or not pollination takes place than day time temperatures. This is because ideal fruit set occurs within a very narrow range of night temperatures (60°-70°F). If tomato plants experience night temperatures above 75°F, interference with the growth of pollen tubes can

(Continued on page 4)
occurs, preventing normal fertilization and causing blossom drop. Prolonged high humidity (>80%) also will hinder good fruit set as the pollen either will not shed freely or the pollen grains may bind together, resulting in poor pollination.

Poor pollination may result in undersize fruit that looks ‘normal’ but is just a great deal smaller. Other problems include poor development of the gel inside the fruit. This causes the fruit to appear angular and soft when squeezed. When this type of fruit is cut in half, open cavities can be seen between the seed gel and the outer wall. High temperatures during the ripening period additionally can cause ‘internal whitening’ in tomato fruit. This white tissue only is noticeable when the fruit is cut. The hard, white areas tend to be in the vascular tissues in the outer and center walls of the fruit. Low potassium levels are also associated with ‘internal whitening’. There is not a great deal that can be done about any of these environmental problems, other than to be sure to water enough and not over-fertilize during extreme conditions.

Although growth-regulating chemicals can be used sometimes to help fruit set under cooler than ideal conditions, there is no growth regulator that will induce normal fruit development under high temperature conditions. Jerry Brust, IPM Vegetable Specialist, University of Maryland, published in Issue # 17 of the Weekly Crop Update, 7/15/2012

Additional Cucurbit Updates

The last couple of weeks we have made a couple of visits to look at peculiar wilting and meltdown of zucchini squash. These were full sized plants on black plastic mulch that otherwise looked fine. They had been harvested a couple of times but were starting to collapse. Upon inspecting the base where the plastic and soil line met, we discovered that we had an issue with the crown area turning soft and mushy. The stem tissue was yellowish in color and slimy with lots of decomposing insects running around the area. My first concern was Phytophthora blight, but there was no characteristic white fuzz anywhere on the stem, or symptoms on the foliage or fruit. My second thought was Squash Vine borer, but I could find no “sawdust” nor could I find any larvae or tunneling in the stem. There was also a lot of scarring from what looked like cucumber beetle feeding all along the crown stem area. I took some pictures and sent them off to our pathologist, Dr. Tom Zitter. Tom was sure we were looking at not just one problem, but several.

Tom felt that the cucumber beetle feeding injury lead to some bacterial wilt, but might also have allowed some of these lesser diseases such as Fusarium, Pythium and even some soft rot bacteria into the wounds which did not quickly take the plant down, but weakened it over time and eventually resulting in collapse of the plant. There is nothing we could do for those plants that were collapsing, but it does further state the need to make sure you take care of those cucumber beetles early in the season to prevent this from happening later in the season.

This week we also had two calls to look at more zucchini and summer squash in which the fruit were becoming misshaped, bumpy with mottling or color breaking. These are all symptoms of viruses which are transmitted by aphids. Both growers swear they never saw any aphids and I believe them. The thing you need to remember about most of these viruses is they are transmitted from these aphids in a matter of seconds so no matter how good a insecticide program you might be on, it only takes one aphid one probe and the virus can be transmitted to the crop. Even if you have treated with an insecticide and contact the aphid, they do not die instantly and can still continue to probe and infect other plants. I’m worried about our pumpkin crop too as I have seen in year’s past near complete loss of some fields due to severe virus infections. The best we can do is make sure we plant the most resistant varieties that are available to us and the good news is there are some varieties that have resistance to several of the viruses, but not all of them. Check with you seed company representatives to see what varieties have the best resistance package.

Blossom drop: I think it is time to mention that with the recent heat and drought stress on our pumpkins, we are going to experience some fruit drop this summer. Pumpkins in particular are quite susceptible to dropping female flowers when temperatures are over 90°F during flowering. Couple that with the added stress the drought has put on the plants makes it even worse. The other issue we deal with is that of pollination when it is this hot and dry. Bees can be more busy trying to cool the hive than out searching for nectar and pollen which can also increase the incidence of blossom drop in those pumpkins.

More on Cucurbit Downy Mildew: More reports this week of Cucurbit Downy Mildew coming in from Michigan and New Jersey, but still no reports locally. However, with the storm fronts that moved through over the weekend and early this week, I would not be surprised if we get a call this week to look at some suspicious cucumbers. The Cucurbit Downy Mildew forecasting program also has us in a “Moderate Risk” for the begging of this week. If you have not applied protectants to your cucurbits, especially cucumbers, now is the time to get it done. We will continue to monitor the forecasting system and respond to any calls that might come in and if we suspect Downy Mildew, we will let you know ASAP. –CDB
Sweet Corn Update

If there was one crop this week that really needed the rain, I think my bet would have to be on sweet corn! In all the years of scouting and looking at sweet corn, I think this year has got to be one to remember. I have yet to be in a field, even those that were irrigated, where the corn is not showing any signs of drought stress. Plants are smaller this year (I know because there have been very few plantings taller than me) and I think in many cases overall ear size is smaller too. These rains might have been enough to help some of our late season plantings, but believe it or not I would not wait too long to fire up the irrigation again as it will soon turn dry again if more rains don’t come through.

This week’s storms seem to have blown some corn earworms into the area. Take note of the counts closest to your location and follow the recommended spray schedule found in Table 1. Be sure to use the “Per week” column because that is the time frame we use for checking our traps locally. Be sure to concentrate your sprays on corn that is silking as these plantings will be most inviting to Corn Earworm moths. The females lay their eggs directly on the silks of the corn. If you are growing some of the Bt varieties, do not solely rely on them to protect you from CEW or FAW, especially under heavy pressure and hot dry conditions.

<table>
<thead>
<tr>
<th>Table 1: CEW Thresholds for treatment</th>
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<tr>
<td>Average CEW pheromone trap catches during silk stage</td>
</tr>
<tr>
<td>Per day</td>
</tr>
<tr>
<td>&lt;0.2</td>
</tr>
<tr>
<td>0.2—0.5</td>
</tr>
<tr>
<td>0.5—1.0</td>
</tr>
<tr>
<td>1.0—13.0</td>
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<tr>
<td>Over 13</td>
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Spray intervals should be lengthened by a day if daily maximum temperatures were less than 80°F for the previous 2 to 3 days.

Since the moth flights have been somewhat low and spraying for worms has been minimal, we need to remember that there are some other pests out there that we still need to keep an eye out for. For example, I had a grower this week tell me that he received a call from one of his buyers indicating that they had found a few small black beetles in his corn. The grower instantly recognized them as sap or picnic beetles. These beetles are usually kept under control with the insecticides that we apply for European Cornborer and Corn Earworm, but because he hadn’t applied anything in a couple of weeks, these pests were able to get a foothold. Aphids are another pest that are usually easily controlled by our worm insecticides, but if we aren’t spraying for worms, we may very well be building an aphid population. I found a nice article that talks more about Sap Beetles below.

**SAP BEETLES:** Sap beetles are common secondary pests of sweet corn usually associated with damage caused by other pests. They can also be pests of strawberry. Sap beetles overwinter as adults or pupae in crop refuse, decomposing corn ears, or decaying fruit on the ground. Eggs are laid in spring. There are several generations per year. They are more likely to be a problem on farms producing a variety of vegetable and fruit crops. Dusky sap beetle is black and plain (3.5-4.5 mm long), while four-spotted sap beetle (also known as picnic beetle) is black with four irregular yellow spots (5-6 mm long). Adults are first noticeable about the time that tassels appear. They may invade corn borer tunnels or areas with other insect or bird damage, feed on pollen or silks, and lay eggs in these sites or in silks at the tip of ears. Eggs are milky white and resemble tiny grains of rice. The larvae are small, pinkish white or creamy colored grubs about ¼ inch long. They may hollow out kernels of the upper half of the ear.

**Monitoring and sprays:** Sample for sap beetles when silks begin to wilt. Inspect the silk area at the tip of 20 ears at each of five sites and determine the percent of ears infested with adults, eggs, or larvae. Sprays for other ear pests usually control sap beetles, but if other pests are absent and more than 10% of ears are infested with sap beetles, treat for sap beetles. Insecticides used to control ECB and CEW, including synthetic pyrethroids, may reduce sap beetle. Insecticides will not completely control heavy infestations. Bt hybrids that produce Bt toxin at the cellular level do not protect against sap beetles.

**Cultural practices:** Ears with exposed tips, especially super sweet and Bt varieties, are susceptible to infestation. To prevent or reduce damage, select varieties that have good tip cover, use clean cultivation, control ear-infesting caterpillars, and remove or bury decomposing fruit on a regular basis. Sanitation is important to prevent successful overwintering and reproduction during the season. Bury corn residue, especially decomposing ears; remove or bury alternate hosts such as rotting tree fruit or discarded vegetables. Burial should be deeper than 4–5”. (Source: UMASS Extension Vegetable Notes, July 19, 2012; Volume 23, Number 13)
I know it is a ways off and I shouldn’t probably be talking about seed potatoes but I have been in a couple of potatoes fields this year in which the stands were terrible and I’ve talked to a couple other growers who also said their stands were not the best. In some cases, they were planted really early and I think suffered from cold, wet soils. However, a majority were planted in condition's that I thought were pretty favorable for getting potatoes started. I guess that is why I am talking about seed potatoes. I think some of our problems might have been related to some seed potatoes this spring that were in pretty poor shape and probably should 't have been planted to begin with. But with the weather last summer/fall and the shortage of seed potatoes, I think some folks looked the other way and planted them anyway. I’m not completely putting the blame on the seed potatoes, but also the way we handle some of our seed before we plant them out. So why else am I mentioning seed potatoes? Because if you haven’t, I think it would be a good idea for you to walk through your plantings and make some notes on what varieties look good and which ones are poor and see if you can match that with where the seed came from. And then start making some phone calls to your seed suppliers now in regards to what they think they are going to have come the fall for harvest and if there are varieties you know you want, try to get your order in as early as you can this fall and early winter—don’t wait till next spring!

From the perspective of a farmer surveying the crops, different types of flea beetles do not look much different — they all are small and black, they all hop away when you approach the plant, and they all make small round holes in the leaves. When eggplant, tomato and potatoes are hit hard by flea beetles, the damage is usually caused by the potato flea beetle, *Epitrix cucumeris.* Another species, the eggplant flea beetle, looks very similar but is found in more southern areas. Summer adults are busy feeding now.

**Chunky and hairy.** In contrast to crucifer flea beetle, the potato flea beetle is shorter and broader (more ‘chunky’), has a more pitted and hairy body surface, and is less shiny, though both are all black. They also have a distinctly different diet, as crucifer flea beetles feed only on Brassica crops and weeds. Their life cycle is very similar: adult beetles spend the winter protected under leaf litter in field edges near the crop where they were feeding in late summer, and search out new food plants in the spring. Eggs are laid in the soil, larvae feed on roots, and after a pupal stage a new flush of adult beetles will emerge. These feed and then move to a protected spot for the winter. Thus there two major flushes of summer adults.

**Host plants and damage.** Potato flea beetle has been reported to feed on cucurbit crops as well as bean, lettuce, radish, turnip and sunflower. It feeds on solanaceous weeds (jimsonweed, ground cherry, black nightshade) as well as redroot pigweed and lambsquarters. Leaves that are heavily fed may be riddled with holes. Growth may be stunted, delayed, or plants may succumb altogether. Potatoes, once well established, can withstand considerable feeding damage. Eggplants are more vulnerable even at later stages. Damage is probably the best measure of flea beetle populations, since they are difficult to count.

**Controls.** In Mid-Summer, several materials can be used as a foliar spray. The two main groups are synthetic pyrethroids and necotinoids. To avoid development of resistance, do not use nicotinoids for both soil and foliar applications, and rotate chemistries after one or two sprays.

For organic growers, spinosad, pyrethrin and kaolin are options that are OMRI listed. Kaolin (Surround WP) protects seedlings by acting as a feeding deterrent. We have observed effective control from applications of a mixture of kaolin and spinosad. *(Source: UMASS Extension Vegetable Notes, July 19, 2012; Volume 23, Number 13)*

**Diagnose pest and disease problems using color pictures:** [http://vegetablemdonline.ppath.cornell.edu/](http://vegetablemdonline.ppath.cornell.edu/)

**Cornell Guidelines for fruit and vegetables:** [http://www.nysaes.cals.cornell.edu/recommends/](http://www.nysaes.cals.cornell.edu/recommends/)

**Cucurbit Downy Mildew forecast:** [http://www.ces.ncsu.edu/depts/pp/cucurbit/](http://www.ces.ncsu.edu/depts/pp/cucurbit/)

**USDA Fruit and Vegetable Market News:** [www.marketnews.usda.gov/portal/fv](http://www.marketnews.usda.gov/portal/fv)

The lower trifoliate leaf on the raspberry sample at left has been heat damaged. This is caused when drought induces closure of leaf stomates which then stops the leaves from cooling themselves via transpiration. The center of a leaf gets hotter as a boundary layer of still air forms, with less damage happening along the edges. So burning in the center of the leaf occurs first. Basically the leaf tissue cooks due to the inability of the plant to cool itself. If air temperatures cool, new leaves will show no symptoms and the plant will compensate. Continue with routine irrigation and make sure to scout for pest problems especially spider mites that blossom in warm temperatures. -LGM

Berry Update

Spotted Winged Drosophila Found Locally and Throughout NY and NE

Last week and early this week scouts throughout the state have reported finding SWD in vinegar traps or through other monitoring methods. These findings have been very small as far as numbers of individuals, but extension specialists in New England are warning that fruit fly numbers balloon quickly from initial sighting to infestation levels. Counties that have reported SWD catches include Albany, Columbia, Monroe, Orange, Orleans, Tompkins and Ulster counties. Similar findings have been reported in Connecticut, Maine, New Hampshire, Massachusetts and Pennsylvania throughout the early summer.

Managing SWD in Berry Crops

When to pull the trigger will be the trickiest decision for most growers. Anecdotally, extension researchers with just one season of experience are suggesting that growers not wait until they see large numbers of SWD in vinegar traps. This is because apple cider vinegar traps do not seem to be good early indicators of SWD. In fact, most folks have been able to find larvae in fruit at close to the same time they are catching adults in the traps. Yeast traps, which are much trickier to see the flies in, have been shown to be much better lures, and some folks have suggested adding cheap wine to the apple cider to increase the potency of the phenol given off.

Once you do decide to spray, the interval will depend on the materials you choose. In fall raspberries, a Malathion (used for control of Japanese Beetle – 1 DTH, 12 hr REI) and Delegate (1 DTH and 4 hr REI) rotation on a 7-10 day cycle should provide adequate control if you start early enough. Spiking the mixture with a sugar solution of 1 lb of sugar per 100 gallons may help lure fruit flies into sprayed crop. Other labeled materials include Molt-X and Entrust. For organic growers, Entrust should be used in rotation with Pyganic, but Entrust will provide the most efficacy. The spray program for organic growers needs to be closer to 5 days to insure control.

For day neutral strawberry growers, materials used for tarnished plant bugs should help knock back SWD, and the use of sugar in the tank might improve the efficacy of the product for SWD. AzaSol is labeled for SWD. Aza-Direct, another formulation of azadiractin, is OMRI approved as is Pyganic. The azadirachtin materials have 4 hours REI. Pyganic has 12 hours.

The cultural aspects of controlling these pests include picking the crop VERY clean. Remove all fruit that is spent. Try to gather drops (or spray the ground). Cull piles of fruit should be buried daily.

How long does it take for fruit fly to develop? Egg to larvae is usually 1-2 days but it can take as few 2 hours. Chilling fruit to almost 32 degrees may actually kill larvae, but temperatures around 40 degrees will only slow development. -LGM

Heat Damage on Raspberry Leaves

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Grower Classifieds

Do you need to buy or sell something that vegetable and small fruit growers in the Capital District might be interested in? Let us know, and we will post it here in the weekly grower classifieds. Try to keep information short, just like with a newspaper classified. We will include up to 50 words and a small (2 inch by 2 inch) picture. This service will be free to all enrolled growers. The deadline for submission each week is Wednesday at 12 noon. If you have any questions, please contact Crystal at 775-0018 or at cls263@cornell.edu.