

July 25, 2020

Pest Alerts: **Onion thrips** heavy locally- could cause problems in storage onions; Basil downy mildew reported on the Cape... also **fusarium of basil** seen here in RI; **potato leafhoppers** on... EVERYTHING, including eggplant, beans, potatoes, beets, dahlias, strawberries, apples; **gummy stem blight** on cucumber (not in RI), which may have come in on seed; **CUCURBIT DOWNY MILDEW** confirmed in Western MA as of 7/24- use at least a protectant fungicide, and combine with a targeted product such as: Orondis Ultra, Orondis Opti, Ranman, Omega, Gavel, Forum, Previcur Flex, Curzate, or Presidio- and rotate through FRAC groups...; **Powdery mildew** is here- maybe not worth protecting first plantings but successions should be treated; **squash vine borer** damaging pumpkins and zucchinis, many seen flying in a pumpkin field in Exeter; **Brassica Alternaria** has been seen in MA- needs some rain to really take off; **two-spotted spider mite** massive infestation on eggplant in a field in South County- conditions have been perfect; all moth pests of corn are flying and larvae are feeding;

The Latest COVID-19 Resources: <https://web.uri.edu/coopext/coronavirus-resources/>

--> Need to discuss? Got something you need looked at? URI Extension: 401-874-2967/andy_radin@uri.edu, hfaubert@uri.edu

RIPE FRUIT!

Now that you've brought your fruiting vegetable plants this far, it's important to get them all the way to **quality ripeness**. That is, make sure that you aren't creating conditions that will lead to ripening disorders. These come in a variety of forms with colorful names and kind of mysterious causes. Breaking

these down, one by one, isn't necessary because most of them are associated with a few key management issues.

The following conditions are associated with excessive heat, in combination with insufficient available potassium:

Blotchy ripening, yellow shoulders, grey wall, puffy or angular fruit, green core, internal white tissue (had one of those today for lunch, at least part of one), and **gold flecking** (covered previously).



All of these disorders are probably manifestations of the same overall issues, which are **excessive heat** and **insufficient available potassium**. And there may be **genetic** (varietal), **viral**, and **other nutritional components** (such as strong imbalances.) Furthermore, any nutrient cation's availability can also be affected by **irregular and/or insufficient watering**. I was just

checking soil moisture status the other day in a patch of field tomatoes in a good, silt loam. The grower had left someone inexperienced in charge of watering and, using a soil probe down to 12", I was able to show him some pretty dry soil all the way down through that soil plug. In the recent conditions we've been having, this does not bode well for this tomato crop. Heat related conditions like this are more common in high tunnels, which are absolutely amazing for the shoulder seasons, but full-on summer heat and peri-solstitial light [Like that term? I made it up.

Update from Middletown: Downpours, Droughty, and Diamondbacks

Greetings from Aquidneck Island! The weather summary here is droughty, punctuated by major storms. For several days we dodged a number of events until July 14th, when a fast-moving system dumped three inches of rain in an hour and a half, throwing in some small high winds and small hail at the end. Not much damage except to some lettuce leaves and zucchini plants; we count ourselves pretty lucky. This time.

After that deluge, we have had nothing for rainfall. Managing water remains our biggest concern this season, and managing even water on fruiting crops like tomatoes is even more of an issue. Lacking tensiometers (high on the list for next year!), we have had to resort to getting out a shovel after a deep watering to make sure irrigation was penetrating down to the root zones.

Everything seems to be in a hurry with the heat and drought stress. Yesterday we observed fist-sized acorn squash on “Sweet REBA” from a June 15th planting, and we are just hoping the plants keep growing and that we are not harvesting winter squash and pumpkins at the end of August. No one wants a Labor Day pumpkin, and we really do not have the storage capacity to hold a couple of tons of pumpkins until October.

Pest pressure has been remarkably low. Squash vine borer moths came and went without much visible damage and cucumber beetle and squash bug populations seem to be moderate. All manner of cabbage moths are out, including diamondbacks, and we are still keeping some crops under row cover. We have had minor to moderate blister beetle damage in beets and chard but again, they do not seem to be here to stay.

Two quick variety notes. If you’re looking for a butterhead lettuce with some heat tolerance, “Anuenue” [Ed note: how do you say that?] from FEDCO has been a good performer for us, holding well in the field for one to two weeks even in drought. And if you, like us, are among the minority who still grow field tomatoes, “Red Racer”, a determinate saladette or cocktail tomato, came through in just 57 days, producing clusters of two-ounce tomatoes in copious amounts. It doesn’t have the great-

est taste, but hey, it’s an early tomato and the customers walk away happy. Hope you are all well and that you are not burdened with too many husk tomatoes as the dog days of August approach.



It's Pepper Maggot Time!

Late July is when the adult flies are laying eggs on not just bell pepper fruits but also on chili peppers (cherry peppers are a good monitoring variety), horse-nettle fruits, and eggplants. Actually, probably the best monitoring plants are the eggplant fruits of the species *Solanum aethiopicum*. These are grown by many immigrants living here in RI from African countries. People call them “Bitter Ball” or “Garden Egg” (above). We have seen lots of oviposition (egg-laying) scars on their fruits, and they are very easy to see. Damage from the maggots doesn’t often manifest itself until fruits are full sized, by mid-August. Unfortunately, this damage could be a surprise to the customer, since interior damage (mainly to the placenta – yes, you read that right- which is the central part where all of the seeds are) may be invisible until the fruit is cut open. Work by my now-retired colleague at UConn, Jude Boucher, demonstrated the efficacy of a spinosad bait product, which attracts the flies. Read about it here: <http://ipm.uconn.edu/documents/raw2/html/645.php?display=print>

Ripe fruit, continued...

It means the weeks on either side of the solstice when the sun's intensity, due to high angle of incidence, is at its maximum.]

Addressing excessive heat needs only be done in a tunnel, and that's where it's necessary; our outdoor temperatures rarely stay hot enough for the sustained periods that causes these disorders.

[Remember also that high temperatures can cause blossoms to abort.] So, for managing high tunnel highs:

- Make sure your **rollup sides** are actually rolled up! I commonly see these rolled up only halfway, even when it's sunny and 92 degrees OUTSIDE. What do you think the temperature is INSIDE?
- Construct your end-walls with **removeable or open-able panels**, especially at the peaks.
- Consider modifying your tunnel with a **solar-powered roof vent**.
- Spray a **whitewash** solution on the cover using hydrated lime in water. This is cheap. It's also not so easy to get even coverage to the degree that you might want. If you over-do it, you'll shade out too much light, and it will take too long to wash off. Apply lightly. You can always put on more.

Shade cloth gives you a known quantity of shade (30% is recommended). But they do cost money... like >\$1,500; but probably worth it. Also, it does require 2 to 4 people to secure it, but it's easy to do.

Also, particularly in high tunnels, **supplemental potassium** is pretty much essential. And it should be in the soil already by the time flowering begins and should be regularly applied even up to early September. P.S.: Foliar application of potassium is useless.

Associated with pollination or flower development problems are zippering and cat-facing.

Zippering is that neat brown line that can run from the blossom end, like a line of longitude, up to the calyx end. Sometimes, there will be a sort of hole (not an oozing one) along the way up. The exact cause is unknown but it's thought to be connected to abnormal blossom development. Some varieties are more prone to it than others, though I have seen it on commonly grown, round, red, commercial hybrid varieties. **Catfacing**, where the blossom end is distorted, necrotic, and there is no distinct, single blossom scar, is thought to be caused by low temperatures during pollination. Often your earliest fruit clusters will have some of these, and then it becomes less of a problem as more clusters ripen. Unless you are growing varieties prone to it. I am quite certain that in the dawn of hybrid tomato breeding, one of the first fruit characteristics that they were looking for was fruits not prone to catfacing. There are certainly also open pollinated varieties that are less prone. But in most of those hefty large heirloom varieties, it's nearly inescapable. A good bet, anyway, is to remove the first cluster of blossoms on such plants, unless you transplanted very late. Cool nights in mid to late May will insure that your first ripe fruits will have this problem.

Associated with inconsistent water availability are: blossom end rot (internal and external), rain check, radial cracking, and concentric cracking.

Blossom end rot (BER) is sort of an old (un)favorite of ripening disorders, particularly because it's so common in backyard gardens. And everyone always reads and says "calcium deficiency." Yes, that's true, it's calcium deficiency in the fruits, but not necessarily anywhere else. You can have BER with abundant available soil calcium. But if water availability is uneven or erratic, the Ca will preferentially go to those high transpiration parts of the plant. And if plants are just generally under-watered, you'll see more than just calcium deficiency- all nutrients need to be taken up dissolved in water. Mulch, of course, helps reduce

Ripe fruit, continued...

direct evaporation of water from the soil surface. *Adequate irrigation* is also very important- less frequent, deep watering is better than more frequent, shallow watering. And by the way, fruits don't absorb sprayed-on calcium, and leaves don't really absorb much, either. Best method is to supplement with any needed calcium, following a soil test, before planting. [Note that BER can occur internally in fruits that look perfectly fine on the outside- it's those disgusting, black hardened chunks that you occasionally find inside the fruits.]



Internal white tissue around the outside edge

Rain check, radial cracking, and concentric cracking are all water-related. Rain check is the very fine, concentric cracking around the stem end of the fruit- fine, brown cracks that feel kind of rough. Concentric cracking is a much larger-scale version, leaving nearly white, healed-over tissue (and sometimes not). Radial cracks radiate out from the stem end, and often become secondarily infected. Lots of breeding has been done to reduce this, but if soil moisture isn't steady, it can happen to even the least prone varieties. In the high tunnel, you can control water. In the field, a heavy rainstorm can really change things, especially if it's been dry and you've been under-

watering. So even in the field, maintaining adequate soil moisture is key to preventing these conditions. You don't want to put cracked fruit into boxes containing good ones- one cracked tomato can spoil the whole box...

Finally, it's worth mentioning **Sunscald**. According to a reliable source, when fruit tissue reaches 86°F, yellow pigments develop, but not red pigments. [Thus, yellow shoulders and other heat-related ripening disorders.] But when the tissue reaches 104°F, the tissue bleaches white and dies. Direct sun exposure plus a hot tunnel can cause this pretty easily if pruning was overdone or tomato leaves are small due to under fertilization. No, you don't want leaves the length of your arm (I've seen that) but you *do* want them longer than your hand. Foliar disease in the field also causes a canopy that doesn't shade fruits. Yes, removal of diseased leaves is a good way to slow down disease spread, but wait until the oldest, lowest fruits on the plants ripen. This goes for peppers, too, which can get pretty bad sunscald. Often, plants over-laden with peppers will tip over, and this exposes more fruit to direct sun. That's where staking can really improve fruit quality. This is especially important if you are ripening to red.



Catfaced fruits are easy to spot well before they ripen. Pick them off early. Photo by Jake McNamara.

LATE July Pest Gallery...



Top left: Squash vine borer damage to a zucchini plant; Above: Basil with Fusarium; Upper right: Two-spotted spider mite infestation on eggplant; Middle right: hopper burn from potato leafhopper on BEETS!; lower right: as-of-yet unidentified affliction of Ground Cherrys– causes plant to wilt, large stems rot– possibility of European corn borer but no culprits found... We don't have a sample in hand yet.