Paying Attention to Disease Forecasting

Because it’s been pretty dry (URI only got 0.3 inch on Tuesday evening), most endemic diseases seen in the field are not yet causing defoliation. But one warm, wet period of a couple of days could change that quickly.

Before looking at those threats, let’s consider the “migratory” diseases.

Cucurbit Downy Mildew (CDM)

Spores of this disease blow in from more southerly areas where it can overwinter, usually not arriving until later in August. But we have seen it in July, so keep your eyes open for it. It moves northward over the course of the summer. Plant pathologists and extension agents report sightings to a website so that we in more northerly areas can be ready for it. You can check on line any time you want to see the map showing where the latest reports are: http://cdm.ipmPIPE.org/scripts/map.php. Along the left side, if you click on forecast, you see a map (right) ---->

The orange area indicates moderate risk, red is high risk. So we are OK for now. Note that leaf wetness is required for the pathogen to infect, so even if it has arrived in the area, infection won’t occur as long as we have warm nights and little rain. Cucumber and muskmelon are susceptible to all strains while other cucurbits are only susceptible to certain ones. Symptoms vary between species: http://blogs.cornell.edu/livegpath/gallery/cucurbits/downy-mildew-o-cucurbits-early-symptoms/

A new strain of the pathogen has developed since 2004, and only now are new resistance genes being bred into new varieties. Even so, the older resistant varieties do provide some resistance to the new strain. Read about management of CDM in Meg McGrath’s posting here: https://rvpadmin.cce.cornell.edu/uploads/doc_580.pdf

Powdery Mildew of Cucurbits (PM)

Another disease “from away”, we reliably see it on any cucurbit crops by mid-summer- it has now been reported in CT, MA and LI, but not yet in RI. Unlike most foliar diseases, it does not require a film of water, but does need humidity, which is why it gets started in lower leaves under the canopy. Older, first plantings of summer squashes are often the first to get it. If you have a new planting coming up alongside an old one, remove the old infected plants. Preventative treatment of young plants is much easier than older plants: under-leaf coverage is difficult without an air blast sprayer or drop nozzles. The best control is to use resistant varieties, and there are now many. Check this page for resistant varieties of not only cucumbers, but all vegetable crops, to all the major diseases, as compiled by Meg McGrath.

http://vegetablemdonline.ppath.cornell.edu/Tables/TableList.htm

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The dry summer has been great for plant health- occasional thunderstorms are really helpful, but extended periods of wetness are not. Being ready for disease development can keep the sales cranking up ever higher. Being ready means a lot of things: keeping the weeds down and pruning to promote air movement; using spacing that maximizes yield AND air movement; choosing RESISTANT varieties; and using protectant fungicides when conditions are forecast to favor disease development- which means RIGHT NOW as we head into what looks like a wet upcoming week. Apply BEFORE the rain.

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

**Basil Downy Mildew (BDM)**

Fortunately, according to those of us extension people who have a phone conference every week, there’s only been one report around New England - reported by a grower in Southeast MA. This is another migratory disease, though it has a greater chance of showing up in odd spots because it can come in on transplants from away that are shipped to big box stores and distributors. It can also be brought in on seed. It seems that Eleonora’s resistance is not all that great - we see it infected every year. However, new resistant varieties have been released following research at Rutgers: ‘Devotion,’ ‘Obsession,’ and ‘Thunderstruck.’ Another is called ‘Amazel.’ The caveat is that additional management practices should be used, including reduced planting density, weed control, and protectant fungicide application. As for the last strategy, there are several very effective products using conventional chemistry, but control has been mixed to poor using organics. You can read through Meg McGrath’s conclusions on product efficacy here: [http://blogs.cornell.edu/livegpath/research/basil-downy-mildew/](http://blogs.cornell.edu/livegpath/research/basil-downy-mildew/)
Our Local Diseases

Leaf spots on Tomato

The two most reliable field tomato diseases are Early Blight (*Alternaria solani*) and Septoria (*Septoria lycopersici*). It’s unusual to NOT see one of these by some point later in the season. Therefore, there’s nothing wrong with seeing it later- but if you see it earlier, like by the middle of July, a great deal of defoliation from the bottom up will take place unless you do something to manage it. Loss of older leaves is not a problem; it’s a problem when younger leaves get it. Infections begin on oldest, lowest leaves which are down in the canopy and remain wet for longer periods, especially after rain or cool nights when heavy dew is formed. While infection can begin through leaf stomata, germinating spores can also penetrate directly through the leaf surface, and leaves become more susceptible when nutrition is inadequate. (But you also don’t want hyper-lush plants, which is attractive to potato aphids... it’s a fine line!). Because determinate tomato varieties produce for a relatively limited time, trellising can be optional, but if you regularly have severe cases of these diseases, trellising is recommended. Plastic mulch can certainly reduce splashing up of conidia from the soil surface. Indeterminate varieties should definitely be trellised or tied up. Finally, protectant fungicides really do reduce disease severity. **Protectant fungicides must be in place on the leaf surfaces BEFORE it rains.** For organic producers, materials containing copper is the first choice, but other materials have been evaluated, with Sporarec coming out on top in a NY trial in 2011 (Lange, Smart and Seaman).

**Forecasting** is available at the TOMCAST website: [http://newa.cornell.edu/index.php?page=tomato-diseases-tomcast](http://newa.cornell.edu/index.php?page=tomato-diseases-tomcast). On the left is a snapshot of the NEWA Tomcast web page. Disregard the glaring red danger-color: it means we’ve exceeded the minimum number of accumulated “Disease Severity Value” for this season- and that means according to this that you should already be on a spray schedule. That may or may not be true, depending on how you want to manage. What IS important is to look at the forecast for upcoming individual days. Note that the **Daily DSV for Sunday July 22 is 4**, which means that it will be WET and you want to have your plants protected BEFORE that. Again, don’t be alarmed by the red next to the Late Blight BLITECAST line: this simply says that conditions have accumulated that favor disease development... but that’s not true if the disease hasn’t migrated to our region, either by weather or transport. Unlike the leaf spot diseases discussed above, Late Blight is NOT a regular visitor to our region. The only cases in the Northeast so far this year have been in Central NY and in two locations in PA, and these were in June. No new infections have been reported since in locations closer to Southern New England. If you want to monitor this yourself, go the the USAblight website: [http://usablight.org/](http://usablight.org/).
More local diseases

**Bacterial leaf spot of pepper** is very common and being seen already this summer in RI. While it can come in on seed, it overwinters in crop residue and usually shows up first in susceptible varieties, which more often than not, are chili peppers. Many bell pepper varieties do have disease resistance now, though there are a number bacterial strains to resist. But if your bell peppers are right along side of diseased chilis, it can spread. Look for brown irregular flecking on older leaves, along with browned edges. Eventually, lower leaves start dropping off, and plants are defoliated. Wet periods can make this disease really take off. Copper can slow the spread, and one Florida efficacy test showed good efficacy for Serenade Max.

**Phytophthora blight**, of pepper and cucurbits, like downy mildews, is a water mold, and needs lots of free moisture. It can remain in the soil for many years, but not infect plants unless conditions are right. The most important conditions for this devastating disease is the anaerobic conditions of a water-logged soil- a wet spot that doesn’t dry out for days after a good rain. Avoid planting anything in those wet spots. If you begin to see wilting plants, consider yanking them all out and removing from the farm. Only synthetics have shown efficacy, and there are resistant strains, so they don’t always work, either.

The larger **Brassica** vegetables can get two common foliar diseases at any time during the summer. **Alternaria leaf spot** has a similar appearance to it’s cousin that afflicts nightshades in that it has the target-like lesion, which is usually rounder on the brassicas. It also starts on the lowest, oldest leaves, both because they are more susceptible when nutrient starved and also because lower leaves can remain wet for longer periods, which favors spore germination. This pathogen also sticks around on crop debris in soil and infects our native mustard family weeds. Spores can be blown in on wind, introduced by tools, brought in on seed, and even flea beetles have been shown to spread infection. So: don’t overcrowd plants, give them the nutrients they demand, and apply protectant fungicide. Both Double Nickel and Regalia have been found to be effective in NY trials. Synthetic protectant fungicides are effective, as well.
More local diseases

The other common Brassica disease is **Black Rot of Crucifers**, which is a bacteria that infects leaves through the hydathodes, tiny pressure relief valve pores along the edges of leaves. You often see droplets along leaf edges in the early morning when the turgor pressure of leaves is highest. These openings provide a great entry point, and black rot lesions always start at the edges of leaves and are v-shaped. Leaf veins turn black. Again, wetness promotes the development and spread of the disease. Warm rainy conditions like this coming week can bring this on. Crop rotation is numero uno: three to four years. Wild mustard family weeds also keep it around your fields. It can also come in on seed: hot water treatment is recommended if there is any question about the seed source. Copper can be preventative, but once the disease is under way, there are no good controls.

Leaving you with a beautiful garden shot from **Sweet Pea Farm CSA** in Charlestown—Way to Go, Kathan!