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Weekly Vegetable Update

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Regional Updates:

Cucurbit Downy Mildew and Late Blight are Spreading in Eastern NY

We have found cucurbit downy mildew on cucumbers in Columbia and Washington Counties, which means that inoculum is spread through at least the southern two thirds of our region. Make sure to scout your cucumbers first because they are most susceptible to the race of cucurbit downy mildew historically present over the last several years. Also make sure you are on a fungicide program tailored to downy mildew protection and control. For a week-by-week program, see page two of this newsletter.



Late blight was found in Westchester county last week, in a tomato planting. This very close proximity to our region should put our growers on high alert. Make sure you are on a weekly spray program to protect your plants and scout the field regularly for any symptoms of late blight. If you have concerns about late blight in your fields, please let us know. We are happy to scout with you.

Last week was, overall, a good week for harvesting and planting. Very heavy rains (hardest-hit areas of Orange County getting 5-7+ inches in a matter of a few hours) fell on Friday with more rain on Tuesday creating ponding, some flooding and tough harvesting and management conditions. Other parts of the region have only benefitted from this week's rains, so as usual this season variable conditions are the norm.

Besides the water molds, bacterial diseases are also on the rise with the identification of bacterial canker in tomatoes (look for an article on this topic next week), bacterial spot on tomatoes and peppers, and an increasing amount of bacterial neck rots observed in onions. Powdery mildew is also continuing to advance on older plantings of summer squash and now on pumpkins and winter squash as well. Remember to kill older plantings of summer squash to reduce the amount of inoculum present in the field.

Garlic drying is going well throughout the region. Many growers have cut tops and roots off at this point and are considering options for storage. Before putting garlic in any environment where airflow will be limited, make sure the entire bulb is completely dry all the way to the center of the scape. We have already seen some issues with mold forming in closed containers because garlic was packed up before fully dry. Even after dry, garlic should be kept in a low-humidity environment to prevent surface mold issues. Running a dehumidifier in enclosed spaces accomplishes this goal very well. If you are having issues with storage quality, contact Crystal and look for a more comprehensive article on the topic next week.

Cucurbit Downy Mildew is in the Area!

On Friday of last week and Tuesday of this week I found CDM on cucumbers on two different farms—one in Washington County and the other in Columbia County. It was not hard to find in the oldest plantings, nor was it hard to find in the next new plantings either. Both growers were treating with both CDM specific materials and protectants. Remember, cucumbers are the most sensitive crop to this new strain of CDM so focus your attention in those and remember that all stages are susceptible so if you apply a fungicide, be sure to apply it to all the plantings. I also got a note the other day that Maire found CDM on zucchini in Orange County.

Because CDM is in the area and we have had a fairly active weather pattern the last couple of days, using only protectant fungicides is not going to be enough to control CDM. In addition, the CDM forecasting system has most of NY and Southern New England in a high risk potential for spread and disease development for the majority of this week. So with that said, the appropriate fungicide schedule may look like this:



Photo by GJ Holmes

Downy mildew on cucumber. Note the yellow angular spots. These will eventually turn necrotic as seen near the center of the photo.



Photo by GJ Holmes

Downy mildew on cantaloupe. Note chlorotic (yellow) halos around the lesions. This is diagnostic of the disease on cantaloupe. However, positive identification of downy mildew requires visualization of the causal fungus which can be found on the leaf underside.

Right now: Presidio (4 ozs/acre) plus Curzate (5 ozs/acre) and a protectant like Bravo or other chlorothalonil product. In talking with our pathologists, this combination would be a good one to start with because Presidio is still our best product against CDM, but adding the Curzate (note there is a 3 day PHI for this material) gives added “kickback” or burnout activity. However, Curzate does not have a long residual which is why you will need to add another product with longer residual like Presidio. If you don’t have Presidio or don’t want to use it due to the crop rotational restrictions, you can use Previcur Flex at 1.2 pints /acre or Ranman at 2.1—2.75 ozs/acre. You could also replace the Curzate with Tanos (8 ozs/acre) as one of the active ingredients in Tanos is the same as Curzate.

Week 2: Depending on what you used above, switch to one of the other products. For example, if you used Previcur Flex last week, then switch to Ranman this week plus a protectant like Bravo or other chlorothalonil product or mancozeb (please note that mancozeb has a 5 day pre-harvest interval).

Week 3: Use whichever product you have not used yet mentioned above. If you used Presidio or Previcur Flex last week, rotate to Ranman (2.1—2.75 ozs/acre) or vice versa plus Bravo or other chlorothalonil product or mancozeb (please note the 5 day preharvest interval with any maneb/mancozeb containing product).

Week 4: Repeat above schedule. -CDB

Downy Mildew in Cole Crops

By Christy Hoepfing, Cornell Vegetable Program

Downy mildew (DM) is commonly found in broccoli, collards and mustard greens but also occurs in cauliflower and cabbage. Temperatures of 50 to 60°F and abundant moisture from rain or dew are optimum for disease development and spread. It is most common in seedlings and in mature plants in the fall. With the cooler than normal temperatures, it has already started to show up on lower frame leaves, especially in broccoli plantings and at sites where the transplants had DM.

On older leaves, DM causes irregular, yellow to brown spots on the upper side of the leaves (Fig. 1) with a grayish, white mildew on the underside of the leaves (Fig. 2) during cool, moist conditions. As soon as lesions are evident on older leaves, spores can spread to marketable portions of the crop. Late season infections can cause losses in cauliflower and broccoli by internal discoloration of the heads. It also leaves the heads

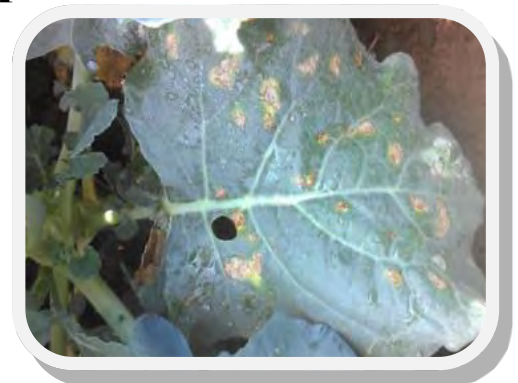


Figure 1. Downy mildew causes irregular, yellow to brown spots on the upper leaf surface, which shows up on lower frame leaves first. Photo: C. Hoepfing

continued on page 3

Downy Mildew in Cole Crops, continued from page 2

more susceptible to soft rot bacteria and other storage rots, especially in cabbage and broccoli.

The pathogen survives in crop debris and in soil. Seedlings and seed may become infected from soil. An infected seedling may grow out of DM symptoms, but the disease can remain in a latent (no symptoms) state within the plant, and flare up when favorable conditions resume later in the season.

Differences in susceptibility to DM commonly occur among varieties; choose DM-tolerant varieties especially for late season broccoli. And scout varieties known to be susceptible to DM more diligently; for example, Superstar cabbage variety and Bay Meadows broccoli variety. In addition to Bravo, Quadris and Cabrio, which are also labeled for Alternaria leaf spot, several other fungicides are labeled for DM including Ridomil Gold Bravo, Reason, Presidio (new), Phostrol/Prophyt, mancozeb, Acrobat/Forum, Alliette, copper compounds (several OMRI approved) and Actigard. In Cornell and other university studies, Presidio (PHI = 2 days) consistently provided excellent control of DM. Bravo and mancozeb also provided good control of DM, while Actigard did not work. For resistance management, Presidio must be used in a tank mix with another fungicide for DM with a different mode of action, such as Bravo. To prevent inoculum buildup in the soil, destroy crop debris as soon as possible after harvest. Rotate ground away from crucifers for at least 3 years.



Figure 2. On the underside of the leaf, the lesions of downy mildew have a grayish, white mildew.

Photo by C. Hoeping

Northern Corn Leaf Blight

The last several weeks we have been finding low levels of Northern Corn Leafblight (NCLB) in sweet corn. Looking back at some notes from last year, it was September 12, 2012 when we first noted finding noticeable levels of NCLB in the area. So we are seeing the pathogen almost a month earlier than last year and I am concerned about late plantings of sweet corn this year. With the cooler nights and heavy dews, it is becoming easy to find in most sweet corn plantings.

Northern Corn Leaf Blight affects both sweet corn and field corn and is a disease that should not be taken lightly as it can both affect ear quality (discolors the husk leaves) and can essentially defoliate a plant. Look for long, grayish cigar shaped lesions on the lower leaves first. I have heard of sweet corn being rejected by buyers because of low levels of NCLB on the flag leaves of the ears.

The first line of defense for sweet corn is selecting varieties that have NCLB tolerance or resistance. This information is generally noted in the seed catalogs, or you can ask your seed salesman. The second line of defense is a fungicide. There are several recommended materials that can be used, including those in Group 11 FRAC fungicides: Headline and Quadris, or those in Group 3: PropiMax and Tilt. Quilt or Quilt Excel are premixes of both the active ingredients in Quadris and



PropiMax and Tilt. The recommendation is to alternate between Headline and PropiMax or Tilt plus a protective material like Bravo or mancozeb (Dithane). **However, pay attention to the pre-harvest interval of these materials as they range from 7 days to 14 days.** More recently a fungicide called Proline (prothioconazole), a Group 3 fungicide, or Stratego which is a pre-mix of Proline and another active ingredient called trifloxystrobin (Group 11), has been labeled in NY and has a preharvest interval of 0 days with a 12 hour re-entry period. You need to rotate between the Group 3 and 11 fungicide groups for fungicide resistance management. Please be aware if you are applying pre-mixes that contain both groups or only a single active ingredient as this will determine your fungicide schedule.

Again, with sweet corn planting schedules getting screwed up this spring with the weather, a lot more later sweet corn and field corn was planted this year than normal. If our weather stays cool with frequent showers or heavy dews, NCLB could really get a foot hold here and ruin some of these plantings.

Once corn is harvested, corn residue should be destroyed as soon as possible in order to reduce the amount of inoculum and further infection of later plantings. You should also try to rotate out of those fields infected with corn for at least one year or better yet two years, if possible. -CDB

Southern Blight Rarely Seen in Northeast Found in Mid-Hudson Valley

A few weeks ago, I pulled up a sick looking tomato plant with symptoms I had never seen before. Overall the plant looked wilted and yellow; I thought it might be *Verticillium* or *Phytophthora*. A closer look revealed that I was looking at something different and unusual for our area. Turns out its Southern Blight caused by the fungus *Sclerotium rolfsii* sometimes called crown rot or white mold.

This disease is rarely seen in the Northeast but in southern states it is a major disease of tomato and other crops such as peanut. At one time Southern blight was thought to be a disease problem only in warm climates but since 2002, incidents of the disease have been reported from Illinois, Iowa, Michigan, and Minnesota. It was thought that the overwintering structures of this fungus were not cold hardy, but they have now been shown to survive winters when under cover of snow and/or mulch.

Unfortunately, this disease has an extensive list of over 500 host plant species including many solanaceous crops, legumes and cucurbits.

The first symptoms of this disease are drooping of leaves. On the stems, a brown, dry rot develops near the soil line. The fungus produces a large amount of cottony white, thread-like material called mycelium, which can grow up the stems of plants and also spread out across the soil to infect other plants. A key diagnostic feature is the overwintering structure, called sclerotia that may develop when temperatures are between 80-95 F. The sclerotia of *S. rolfsii* are small, round, and typically a brown or tan color when mature. The fungus can also attack fruits where they

touch the soil. The fungus can survive for years in soil and plant debris. It is favored by moist conditions and high temperatures.

Southern blight can be confused with white mold (*Sclerotinia sclerotiorum*), another fungus with a broad host range that produces white, cottony mycelia. Sclerotia produced by white mold are brown-black, resemble rodent droppings, and are usually found on the inner stem of infected plants.

Once in the field, management of Southern Blight can be difficult. Although crop rotation is a traditional and preferred method to control disease, it is not very effective in controlling southern blight because of the broad host range of *S. rolfsii* and the survivability of sclerotia in the soil. Rotating with non-susceptible crops, such as corn or wheat, may help decrease disease incidence in following years by lowering inoculum.

If you think you may have seen or do see symptoms of Southern Blight, I would be interested in hearing about it. Pictures can be emailed to me at tr28@cornell.edu -TR



Southern Blight on tomato. Image: Teresa Rusinek

Article Sources:

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- Southern blight, Southern stem blight, White mold. J. Mullen. 2001. *The Plant Health Instructor*. DOI: 10.1094/PHI-I-2001-0104-01. Updated 2006.
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Weekly Weed Spotlight on Purslane: *Portulaca oleracea*

By Justin O'Dea, CCE Ulster County

Seemingly humble and unassuming, purslane is a common sight underfoot in crop fields this time of year, as it begins to reach its pinnacle. Management of this weed is often an afterthought, and may be outright prohibitive if crops don't allow access to a field for a management effort. Purslane is commonly neglected because it's not particularly competitive with crops compared to others, but a potential concerning problem with purslane is that *it is an alternate host for Phytophthora blight*, along with several other soil borne

diseases. Dr. Meg McGrath at Cornell's Riverhead Research Station speculates that this may be a major contributing factor to why rotation intervals tend to show variable success in managing *Phytophthora blight*- *a crop host is always present if purslane is present every year*. If you have had problems with *Phytophthora blight*, and purslane is a common weed in your fields every year, control efforts may be especially warranted.

Common purslane is a succulent warm season, summer annual broadleaf weed in the *Portulacaceae* family ("Purslane family").

continued on page 5

Weekly Weed-Purslane, continued from page 4

Although it is edible and cultivated on a very limited scale, it, *unlike* many weeds, is not related to any *major* cultivated crops. It is presumed to be native to South America, evolved in hot, semi-arid climates, and has a biochemistry more common to tropical plants that allow it to thrive in the hot and droughty conditions more common to mid and late northeastern summers. It is one of our most drought tolerant weeds. Purslane's succulent, sprawling, prostrate growth and reddish stems usually make it easy to identify, as it often fills open spaces in a crop's canopy or bare areas at field edges.

Purslane **management** can be difficult because large seedbanks quickly build up, and because purslane can rebound well from cultivation damage. Purslane is also hard to manage in systems that have few or no cool season crops in rotation because there is little opportunity to try and manage it. **Cultivation** is most effective when purslane seedlings are small, and shallow cultivation will encourage germination that can be controlled with successive shallow cultivations. Larger plants can be more effectively controlled with cultivation that buries plants rather than chopping or uprooting them. Purslane can re-root vegetatively, and it conserves water well enough in its leaves to last longer uprooted than most weeds.

**Purslane Seedling.***Image courtesy of Univ. of CA***Purslane Habit.***Image Courtesy of Oregon State University.***Purslane Flowering.***Image courtesy of University of California.*

Purslane is usually one of the last annual weeds to emerge in the crop season, usually after many crops are well established. This because purslane **seeds** will not germinate when soil temperatures are below 75°F; purslane seeds optimally germinate at 86°F at the soil surface. Seed dormancy is dependent on light/darkness. Buried seeds can be very long-lived (40 years) but the majority of the seedbank may decline after ~4-6 years in northern climates.

Some purslane **seedlings** will emerge in late spring hot-spells, but most will emerge throughout summer, especially following tillage bringing seeds to the soil surface. Seedlings will mature and produce **flowers** after 4-6 weeks. Flowers will **produce seed** after 10-14 days. Seed production can be prolific, and plants may commonly produce between 7000-100,000 seeds/plant. Purslane has not noted to be particularly competitive with most crops, but has been found to be a strong competitor for P in certain situations, and when manure (high in P) is used to meet N requirements, purslane problems may be exacerbated. Purslane grows poorly in shade and is sensitive to frost.

Purslane is known to **host diseases** including *Phytophthora capsici*, *Fusarium*, *Verticillium*, and *Rhizoctonia* species, and multiple viruses of vegetable and field crops.

Multiple days of hot dry weather will help kill cultivation-damaged purslane. Flaming is a poor weed purslane control tool. Mulches and strong crop canopies help suppress purslane growth considerably, and avoiding overabundant manure applications that raise P to high levels will avoid promoting excessive purslane vigor. Multiple **herbicides** may control purslane although post-emergent effectiveness declines after seedling stages. Pre-emergent herbicides also need to be present at the soil surface, where most purslane germination occurs to be effective; tilling in pre-emergent herbicides below 2-3" may negatively affect purslane control. See table 4.2.2 at <http://veg-guidelines.cce.cornell.edu/4frameset.html> for general Cornell guidelines on herbicide choices for Vegetables or the at the xx.7 section ("Weed Management") of each crop chapter at <http://veg-guidelines.cce.cornell.edu/> for more specific herbicide guidelines.

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Corn Trap Catch Numbers

Location	ECB-E	ECB-Z	Corn Earworm	Fall Armyworm	W. Bean Cutworm
N. Washington	1	1	0	0	0
C. Washington	2	0	0	0	0
N. Rensselaer	0	0	0	0	0
C. Fulton	n/a	n/a	n/a	n/a	n/a
N. Columbia	1	3	8	0	13
Saratoga	0	0	1	0	0
Schoharie	n/a	n/a	n/a	n/a	n/a
Clinton	0	0	0	0	83
Essex	0	0	0	0	23
Orange	4	11	1	0	0
N.Ulster	0	0	30	0	0

Weekly and Seasonal Weather Information

Site	Growing Degree Information Base 50 ^o F			Rainfall Accumulations		
	2013 Weekly Total 8/07—8/12	2013 Season Total 3/1 - 8/12	2012 Total 3/1—8/12	2013 Weekly Rainfall 8/07—8/12 (inches)	2013 Season Rainfall 3/1—8/12 (inches)	2012 Total Rainfall 3/1—8/12 (inches)
Albany	124.2	1767.3	2181.3	0.77	22.54	17.39
Castleton	119.9	1863.5	2263.9	0.49	20.73	17.15
Chazy	110.8	1633.2	2230.6	0.64	19.72	14.20
Clifton Park	114.3	1785.8	2045.8	0.67	21.10	20.59
Clintondale	109.2	2019.3	1695.0	NA	NA	NA
Glens Falls	115.1	1673.9	1830.0	0.25	17.77	14.33
Granville	112.0	NA	1940.5	0.01	NA	18.76
Guilderland	122.0	1684.3	1887.5	0.59	6.24	6.16
Highland	127.6	2028.6	2221.0	3.60	19.81	21.61
Lake Placid	77.5	1114.9	NA	1.32	21.32	NA
Montgomery	127.0	1928.2	1963.5	5.53	20.79	NA
Monticello	101.7	1414.0	1930.5	0.08	0.27	1.45
Redhook	127.1	1923.8	2075.0	1.51	16.07	17.36

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