Cornell University Cooperative Extension

Eastern NY Commercial Horticulture Program

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Weekly Vegetable Update

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Northern NY: The weather this past week has been up and down. We've had some warm, muggy spells, a little rain that was welcome because the soil has dried quite a bit, and some cool nights. Saranac Lake had a low of 34 earlier this week!

Crops are ripening slowly. Many growers have commented that their tomatoes have been slow to ripen. Production is good in high tunnels but ripening there has been slow as well. In high tunnels we're seeing a lot of botrytis gray mold (see article in this week's issue) as well as brown leaf mold (*Fulvia fulva* – *see photo*) that is only seen in tunnels. We have seen no control with copper for leaf mold in tunnels. The fungus sporulates on the underside of the leaves, but even when growers were able to direct copper sprays there, they saw no difference.

Some growers aren't ventilating their tunnels as much as they could and both of these diseases are favored by high humidity. Your tunnels should never feel 'tropical' when you enter them. In the field there seems to be more virus than usual on pumpkins. Most plantings got in late and then had a very slow start this year. These weaker plants are less able to tolerate mild virus infestations. Aphids can transmit virus as we mentioned last week. Controlling aphids after they have fed on your plants does little to prevent virus infestation, but it can help slow its spread to other plants.

The cooler, more humid weather has slowed down onion curing in the north. Keep fans on constantly if necessary to keep the air moving. The entire state is seeing more problems with bacterial rot in onions this year. Check your plant necks carefully to be sure they are completely dry before trimming.

Capital District: Good news is in short supply as are some crops. It's hard to believe that it is near the end of August and we are seeing a shortage of tomatoes, zucchini, yellow squash and sweet corn in the region. It just goes to show you how crazy weather months ago can really affect things later on. More Late Blight was confirmed in tomatoes this week and to date all strains have been US 23, which can infect both tomatoes and potatoes. There is enough inoculum in the air that you should be maintaining fairly tight fungicide programs and selecting the right control materials. If you have questions about controls, call one of the regional vegetable specialists listed in this newsletter. Cucurbit Downy Mildew also continues it's march across local cucumbers and melons. Lots of growers are also asking us about the pumpkin crop and right now it is hard to say - I think it is safe to say they are going to be a little later then usual and that deer pressure has been unusually heavy this year. I also think it's safe to say that if you are looking to purchase pumpkins this year, now might be the time to start making some phone calls!

Orange/Ulster/Dutchess: Overall, a better week for field work and welcomed rains Monday night visited many in the region. Onion harvest is in full swing with progress on seeded onions picking up. As mentioned above, bacterial rots are being sighted in seeded onions. Surprisingly, generally, a higher rate than was seen in transplants. As usual, reds are hardest-hit. Most fall plantings are complete or nearly complete. Fungal disease (especially late blight) infections in a variety of crops continues to increase.

Gray Mold on Tunnel/Greenhouse Tomatoes

By Judson Reid, Cornell Vegetable Program

Caused by the fungus *Botrytis cinerea*, Gray Mold has taken off in the last two weeks. Symptoms include death of the leaf from the tip back, brown stem lesions and flower drop; all accompanied by a gray sporulation when humidity is high. Fruit symptoms can include 'ghost spots' or rotten break down. This disease is usually more of a problem in June than August. It seems the cool nights of this summer have favored development of the disease as it is common right now in tunnels, from one end of the state to the other.

Field tomatoes are slow to ripen this year, which has kept wholesale prices high. Tunnels are in a profitable position with plenty of ripe fruit, so keeping any losses to Gray Mold is essential.

Keys to controlling Gray Mold:

- Regular ventilation via fans or roll-up curtains, even in cool cloudy weather.
- Removal of infected plant tissue including leaves, stems and fruit.
- Regular pruning of suckers and lower leaves of tomatoes to promote ventilation.
- Minimize wounds by using clips instead of 'winding' on a vertical trellis (see pic).

In addition to the above steps there are multiple fungicides labeled for the control of gray mold on greenhouse tomatoes. These include:

- Decree 50 WDG (1 day PHI)
- Scala (1 day PHI)
- Serenade Max (1 day PHI) OMRI Approved!
- Oxidate (0 day PHI) OMRI Approved!


Botrytis in trellis wound.


Grey Mold on tomato.


Grey Mold attacking fruit.


Botrytis on tomato leaf. Note sporulation "fuzz".


Ghost spot on tomato fruit.

All photos by Judson Reid

A number of growers have asked about overwintering the disease. Gray Mold is a common detritus fungus and ubiquitous in the environment, often starting on wounds or dead tissue. Although sanitation is very important for reduction of overwintering diseases such as Leaf Mold (Fulvia) and Early Blight (Alternaria); Gray Mold will be here next year no matter what. Ventilation is the key to prevention and is further promoted by appropriate planting densities. When planning next year's crop remember the way the crop looks right now. Is there room for more plants, or is there an ongoing battle with Gray Mold?

Are You Seeing Spots?

By Ray Range, CCE Orange

Cercospora leaf spot of Swiss chard.

Courtesy of Dr. Margaret McGrath, Cornell University, Dept. Plant Pathology, L.I. Horticultural Research & Extension Center

Cercospora leaf spot (*Cercospora beticola*) has caused more economic damage this past week. As the days begin to get shorter, heavy dew and longer periods of wetting along with high humidity provide the wetting period necessary for the growth of many fungal pathogens. Add in comfortable temperatures of the mid 70's to mid 80's, a rainfall or two and Cercospora leaf spot begins to appear in your swiss chard, beets, escarole, and spinach among others.

This pathogen has a huge economic impact as the marketability of the plant as greens become unattractive or are completely destroyed.

Symptoms include small circular tan to brown lesions with a distinctly dark red/purple to brown halo. The center spots may be lighter color on beets than swiss chard and the boarder may be more distinctive on the beets. On swiss chard, the spots are often so numerous that they may coalesce to cause some leaf distortion. Leaves in the center of the plant may be less affected.

Cercospora leaf spot survives between crop cycles in residues from infected crops (as *sclerotia*), in weed hosts like Lamb's quarters, in the soil for up to 2 years and on infected seed. High levels of infection can occur from just a few infected plants. Several cycles of infection can occur throughout the growing season whenever high humidity and temperatures from the mid70's to mid 80's exist. Rain splash, wind, overhead irrigation, insects, workers and equipment can all spread this fungus.

Management includes burying infected crop residues and destroying volunteer plants and weed hosts. Start with certified, disease-free seed or treat seed with hot water or fungicides. Rotate to non-host crops that are not in the Chenopodium (beet/spinach) family for 2-3 years. If disease is present, do a once-over cut then destroy the residue instead of waiting for chard or spinach for regrowth. Avoid planting succession crops close together. Avoid overhead irrigation if it will result in prolonged leaf wetness periods. Consider drip irrigation where practical. In tunnels, keep an eye on humidity and air movement.

Use fungicides as preventative treatment prior to infection. Some resistance to FRAC Group 3 fungicides have been reported so use and rotate fungicides from other FRAC Groups.

Late Blight of Celery and Celeriac - *Septoria apiicola*

Late Blight on celery was sighted on a couple of farms this past week.

Symptoms:

- small, discrete, yellow spots on leaves.
- lesions under close inspection, will probably have small, dark, round structures that are the reproductive bodies of the fungus
- spots often are circular in shape but may be angular when they are delineated by leaf veins.
- Lesions may coalesce to form large patches.
- Mature lesions turn tan and dry out, becoming papery.

Septoria infection of celery.

Courtesy of Ontario Ministry of Agriculture and Food.

Conditions that favor:

- rainy weather, heavy dew or fog, or sprinkler irrigation during temperatures above 70°F
- splashing water disperses spores and aids in spore germination and infection

Source of the pathogen & management:

- This pathogen can be seedborne. Use *Septoria*-indexed seed or hot-water-treated seed and disease-free transplants.
- This pathogen can survive in plant residue. Rotate out of celery for at least 1 year.
- Equipment can spread infection, especially when foliage is wet.
- Avoid overhead irrigation *-MRU*

Newly Identified Celery Disease Confirmed in Eastern NY

By Laura McDermott, ENYCH

During the past few years, several growers in eastern NY have been struggling with a problem in their celery production that has grown more severe with time and made some of them question if they could grow celery on their farm. This summer, the causal agent was positively identified as an anthracnose fungus that caused severe damage to Michigan celery between 2010 and 2012. Lina Rodriguez-Salamanca, an extension field agent with Michigan State University has assembled a fact sheet that answers some of the questions regarding this disease. Some of that information is presented below. For the full fact sheet, visit http://msue.anr.msu.edu/news/celery_anthracnose_a_newly_identified_fungal_disease_of_celery. If you believe that you have celery anthracnose on your farm, please let your ENY extension educator know. The Cornell Guidelines do not list celery separately, so if you are planning to use a fungicide other than the ones mentioned in the article below, you need to check the NYS label by visiting PIMS, or reading the label you have on hand. The caveats for greenhouse and field applications mentioned below also apply in NYS.

Photos courtesy of: Rodriguez-S L.M and Hausbeck M.K 2010

Figure 1. Pictures of celery anthracnose symptoms in the field including (A) a severely symptomatic plant next to an asymptomatic plant, (B) young symptomatic plants, (C) leaf curling, (D) adventitious root formation in petioles, (E) gall initiation, (F) twisted petioles with lesions and (G) an oval lesion.

What is celery anthracnose?

Celery anthracnose is caused by the fungus *Colletotrichum acutatum*. This specific fungus is known to infect other vegetables including pepper, tomato, and spinach. It was first reported as a pathogen on celery in Australia during the 1980s, and was first detected in Michigan in 2010. The common name of this disease is "anthracnose" and is shared with diseases of onions, tomatoes and cucurbits. However, anthracnose in these crops refers to diseases caused by other types of fungi, not the *C. acutatum* that infects celery.

What are its symptoms?

Symptoms include cupped leaves and twisted petioles with long and thin brown lesions (Figure 1). Other symptoms include development of adventitious roots.

What are its economic impacts?

Twisted petioles make infected plants unmarketable.

How can I differentiate anthracnose symptoms from aster yellows?

Similar to anthracnose, aster yellows can cause plant twisting and curled leaves. However, foliage of plants affected by aster yellows turns yellow, while foliage of anthracnose-infected plants remains green.

What conditions favor disease?

The spread of celery anthracnose occurs at temperatures as low as 59 degrees F, but increases in periods with warmer weather or extended leaf wetness, with spores spreading via rain splash.

What cultural controls should I use?

In the greenhouse, disinfect flats prior to re-use, or use new flats each year. This sanitation practice is a mainstay of any standard disease program and is important for both foliar blights and root rots. Scout celery seedlings at least twice each week and look for disease symptoms (Figure 2). Limit periods of humidity in the greenhouse with a ventilation system and by watering seedlings at a time of day that will allow them to dry quickly.

In the field, during the growing season, use practices that limit spread of this disease. Irrigate at a time of day that will allow leaves to dry rapidly. As you begin field operations, work fields with a history of disease after you finish work in locations with no history of the disease. Whenever possible, avoid working fields when leaves are wet (e.g., after fog, dew, irrigation, or rainfall). If you work fields when the foliage is wet you may spread the pathogen from one location to another within a field. If possible, power-wash your equipment with a soap and water solution after working each location to remove soil and plant debris that could carry the disease-causing spores between fields (note that chlorine disinfectants can corrode steel equipment).

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Newly Identified Celery Disease , continued from p. 4

Are there any disease-resistant varieties?

Michigan State University researchers tested 'Greenbay', 'Sabroso' and 'Dutchess' varieties; all were susceptible when challenged with the anthracnose pathogen.

Can I reduce inoculum on my farm by controlling weedy hosts?

The host range of *C. acutatum* is so broad that there is no single weed species you can target.

What fungicides are available for the greenhouse?

To be used in the greenhouse, a fungicide label must list celery as an application site **AND** not prohibit greenhouse application. Unfortunately, labels of fungicides that can be used on celery in the field – including formulations of Quadris, Cabrio and Bravo – prohibit greenhouse applications. However, some formulations of Heritage (Azoxystrobin) and Catamaran (Chlorothalonil) include celery and allow greenhouse application. If possible, use these two fungicides in a rotation to control celery diseases in the greenhouse. Check the labels carefully to be sure that the product you have allows the use of this fungicide on celery seedlings in the greenhouse.

Figure 2. Symptomatic celery seedlings in the greenhouse. (A) a flat of celery seedlings, with symptomatic plants highlighted with a red circle, (B) and (C) leaf cupping on plants from the circled area under magnification, (D) lesions on celery seedling petioles. *Photo credit: Rodriguez-S L.M and Hausbeck M.K 2011*

What fungicides are available for the field?

Rotating strobilurin fungicides (e.g., Quadris or Cabrio) with a protectant like Bravo can limit anthracnose. These fungicides will also reduce early and late blights of celery.

Late Summer, Fall Cover Crops: Preparing Soils for Hibernation

By Justin O'Dea, CCE Ulster

Even though the sight of so many green tomatoes on your vines seems to say that summer is long from over, recent chilly nights are a reminder of the approaching fall. Although it's an exhausting prospect during/after harvest, be thinking about how you want to prepare your soils (i.e. your greatest asset!) for overwintering. Planting a good cover crop help assure that soils are protected from weathering, nutrients are retained, weeds are suppressed, and that soil health and tilth is fostered. Cover crops utilize excess water and nutrients in winter and spring to produce organic matter and can fix nitrogen (legumes), help with good soil infiltration and drainage, and reduce soil surface evaporation. There are numerous cover crop options for late summer through fall seeding. Yes- getting cover crops established in vegetable rotations is often challenging for lack of time and space leading to *no* cover crops, *poorly established* cover crops or *heavy reliance on rye alone*. Don't shy away from doing some informed experimenting *on a small scale* to figure out what might work for you though- there are lot of crop options and logistical permutations that may work for your specific circumstances. Michigan state provides some ideas/options for working cover crops into vegetable rotations, including overseeding covers into standing crops at: http://web2.msue.msu.edu/bulletins/Bulletin/PDF/E2896.pdf

Legumes: Legumes are often a more expensive cover crop, but can pay off in the amounts of nitrogen that they contribute to soils (~50-150 lbs/ac), with organic matter additions to boot. Legumes are good scavengers of residual soil N, and will then fix their own N to meet their needs after available soil N gets lower. Nitrogen is the only renewable nutrient that you can "grow", and legumes are the only way to take advantage of this phenomenon. Because legume N is biologically released, it becomes available more slowly than fertilizer N, and 1) works as an investment in long-term fertility and 2) can increase N use efficiency when managed correctly. Inoculating with the correct strain of rhizobia as a cheap insurance to maximize the N contribution from legumes.

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Late Summer/Fall Cover Crops: Preparing Soils for Hibernation, continued from p. 5

- *Hairy vetch:* This winter annual legume is of the more popular legumes because it is one of the best winter-hardy nitrogen-fixers that also produces a lot of biomass by late spring. It can become a persistent weed though, especially if left to go to seed; vetch seed is hard-coated and can remain dormant for a number of years before germinating. Vetch should be seeded in late summer with a nurse crop (an annual grass), and be terminated in late May with tillage, rolling, or an herbicide.
- *Red clover:* This short-lived perennial legume is also a good choice for a good winter-hardy nitrogen-fixer, even in soils where nitrogen levels are already high. It tends to less expensive and more widely adapted than vetch, produces substantial ground cover/ biomass, and does not have as high potential to become a weed as vetch. Like vetch, red clover is also slow growing, and for an overwinter cover can be seeded from mid-summer to early-fall with an annual nurse crop. Red clover should be terminated in May at flowering.
- *Austrian winter pea:* This annual legume is winter-hardy, and is a moderate nitrogen fixer. It is less commonly used in the northeast since other legumes than can be grown here sometimes fix more nitrogen, and it can have less reliable winter-hardiness. It can be more economical to seed than hairy vetch, and another key advantage is its quick growth; it therefore can produce more biomass in a shorter time, and may be a more suitable cover when the following crop needs to be planted earlier in spring. Austrian winter peas should ideally be planted in September and be terminated at flowering. Peas should be grown with annual cereal crops that help support pea vines, boost overwinter survival, and enhance the soil-protective capacity of the cover. Winter pea vines can get frost-burned overwinter, but will plants will often re-sprout from growing points below the soil surface in spring even if the crop looks winter-killed. Cornell has limited information on winter pea, but it is currently used by some growers in NY. Michigan State has more formal recommendations for winter pea here: http://msue.anr.msu.edu/news/consider_austrian_winter_peas_following_early_vegetables.

Rye-Vetch cover crop.
Courtesy Cornell Dept. Horticulture

Annual grasses/cereals: Annual grasses are usually one of the more affordable cover crops; they provide a quick growing crop canopy with a soil-protective fibrous root system (compared to legumes' taproot system). Annual grass cover crops are commonly grown alone or in grass-legume mixtures; annual grasses provide additional complimentary soil protection and nutrient scavenging ability when grown alongside legumes.

- *Annual ryegrass*: Annual ryegrass can be seeded in august and can quickly form a weed suppressive, soil protective dense sod if nutrients are still adequate after vegetables. Northern/midwestern varieties of annual ryegrass will overwinter whereas southern varieties will winterkill. Overwintered ryegrass will set seed in spring, and should be terminated before seed is produced.
- *Rye*: Cereal rye is a very hardy cool season crop that germinates in cooler temperatures, and can be seeded from ~Sept. 15 - Oct. 15. When seeded in late fall, rye will still germinate, but provides negligible winter cover. It provides good soil cover and weed suppression, and nutrient scavenging. Fertilizer is usually not needed following vegetables. Growers often favor Rye because it can be seeded very late, and should be terminated fairly early (it hence it stays out of the way of the main vegetable growing season), and has weed-suppressive allopathic properties.
- *Oats:* Oats are not winter hardy. They are useful fall cover crops if seeding can occur in September where they have a chance to provide vigorous fall growth. Oat winterkilling eliminates the need to terminate the crop. Oats can be a good choice if the following crop is planted in early spring, or as a nurse crop for vetch and clover since oat winterkilling will allow the legume to completely take over in spring.
- *Barley*: Barley can provide similar cover/services as oats, but is somewhat more winter-hardy than oats and hence may survive milder winters.
- *Winter wheat, triticale, spelt:* These related winter-hardy cereal crops perform similarly as cover crops with some distinctions. Triticale can be planted earliest (Aug. to Oct.), followed by Wheat (mid-Sept. to Oct.), and Spelt can be planted latest (mid-Sept. to mid-Oct). Triticale (a wheat/rye cross) can be more adaptable and vigorous than wheat and will put on more fall growth when planted early; hessian fly is also not a concern for Triticale cover crops. Spelt (an ancestral wheat) can perform better than wheat on low-nutrient soils, and can successfully establish later than wheat, into colder, wetter conditions.

For more information on cover crops, other species not listed here, see:

http://covercrops.cals.cornell.edu/

http://ecommons.cornell.edu/bitstream/1813/3303/2/Cover%20Crops.pdf

http://extension.psu.edu/agronomy-guide/cm/tables/table-1-10-6

http://www.covercrops.msu.edu/

http://ohioline.osu.edu/sag-fact/pdf/0009.pdf

Copper Fungicides for Organic Disease Management in Vegetables

With more late blight confirmed this week in tomatoes, and with scattered showers possible for the rest of the week, I thought this article from Cornell Pathologist Meg McGrath looking at the different copper fungicides labeled for organic use would be of use to many of you. Also, this tends to be the time we start to see many other disease coming into crucifers such as Alternaria and Bacterial leaf spot, which copper can help slow down. -*CDB*

There are several different copper fungicides approved for use in organically-produced crops. Copper fungicides are important tools for managing diseases that cannot be effectively managed with cultural practices alone. They have broad-spectrum activity, acting on bacteria as well as fungi. Following many years of use, there is a lot more information on efficacy of copper fungicides than the newer biological products. Manufacturers of some biologicals recommend that they be used in a management program with copper fungicides (often in alternation or at low label rate). Thus it appears copper fungicides will continue to be important for managing diseases. Copper fungicides differ in their active ingredient, use rate, re-entry interval, and the amount of copper. Copper is an inorganic compound thus it does not breakdown like organic compounds and consequently copper can accumulate in soil when used intensively. Plants take up some copper from soil because it is a micronutrient. Similarly, humans need a small amount of copper in their diets. Metallic copper equivalent (MCE) is a commonly used measure of the quantity of copper in fungicides.

The specific directions on fungicide labels must be adhered to. They supersede these recommendations (above), if there is a conflict. Check state registration and organic approval before using a product. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

Basil: We have also found and had several calls this week about Downy Mildew in basil. I know that we talked about this a while ago, but I thought is might be a good refresher to look at some information provided to us by Meg McGrath on fungicide recommendations and some pictures in order for us to identify the disease correctly. The following information is an excerpt from a longer article titled "Expect and Prepare for Downy Mildew in Basil". The full article can be found at http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BasilDowny.html.

"Fungicides. Applying fungicides frequently and starting before first symptoms are considered necessary to control downy mildew effectively. Many of the fungicides currently labeled for this new disease, plus others not registered yet, have provided limited suppression in

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Highest label rate of organic copper fungicides for some vegetable crops

Product	Active ingredient	Metallic copper equivalent	Maximum Labeled Rate (MCE in lbs)				REI	PHI
			Broccoli	Lettuce	Squash	Tomato		
Badge X2	24% copper oxychloride + 21% copper hydroxide	28%	0.75 lb/A (0.21)	1.75 lb/A (0.49)	1.25 lb/A (0.35)	1.75 lb/A (0.49)	48 hr	0 day
Basic Copper 53	98% basic copper sulfate	53%	3 lb/A (1.59)	3 lb/A (1.59)	2 lb/A (1.06)	4 lb/A (2.12)	24 hr	0 day
Camelot	58% copper salts of fatty and rosin acids	5.14%	0.75 pt/A (0.05)	3 pt/A (0.22)	3 pt/A (0.22)	3 pt/A (0.22)	12 hr	0 day
Champ WG	77% copper hydroxide	50%	2 lb/A (1.0)	Not labeled	3 lb/A (1.5)	4 lb/A (2.0)	24 hr	0 day
CS 2005	19.8% copper sulfate pentahydrate	5%	25.6 oz/A (0.8)	Not labeled	25.6 oz/A (0.8)	32 oz/A (1.0)	48 hr	0 day
Cueva	10% copper octanoate	1.8%	1 gal/A (0.15)	1 gal/A (0.15)	1 gal/A (0.15)	1 gal/A (0.15)	4 hr	0 day
Nordox 75	84% cuprous oxide	75%	2 lb/A (1.5)	1.25 lb/A (0.94)	1.25 lb/A (0.94)	2.5 lb/A (1.88)	24 hr	0 day
NuCop HB	77% copper hydroxide	50%	1 lb/A (0.5)	1 lb/A (0.5)	1.25 lb/A (0.63)	2 lb/A (1.0)	24 hr	1 day

MCE = Metallic copper equivalent. REI = Re-entry interval. PHI = Pre-harvest interval. Most labels do not state minimum time after an application that harvest can be done; however, the REI for Worker Protection Standard affects harvest.

Copper Fungicides-Organic Disease Management, continued from p. 7

fungicide evaluations, demonstrating the difficulty in controlling this disease, especially in a research setting with applications made with a backpack sprayer, and thus the importance of starting before disease onset. Part of the challenge of controlling downy mildew is the need for blemish-free herbs when marketed as fresh sprigs. Actinovate AG (active ingredient is *Streptomyces lydicus*), Double Nickel 55 (*Bacillus amyloliquefaciens*), MilStop (potassium bicarbonate), Regalia (extract of *Reynoutria sachalinensis*), Trilogy (neem oil), and OxiDate (hydrogen dioxide) are OMRI -listed fungicides labeled for use on herbs and for suppressing foliar diseases including downy mildew. MilStop, Regalia, and OxiDate are labeled for use outdoors and in greenhouses. The Actinovate, Double Nickel and Trilogy labels do not have a statement prohibiting use in greenhouses. Double Nickel label has directions for greenhouse use for soil-borne pathogens. OxiDate has limited residual activity and thus if used should be combined with or followed by another product.

Fig.1: Yellowing of the upper surface of affected basil leaves often occurs in sections of the leaf delineated by veins because the downy mildew pathogen cannot grow past major veins in leaves.

Fig.2: Purplish gray spores of the downy mildew pathogen only develop on the lower surface of leaves. These are the same leaves in Fig. 1. Sporulation coincides with yellowing on the opposite side of the leaf.

Ranman (cyazofamid), Quadris (azoxystrobin), Armicarb (potassium bicarbonate), and phosphorous acid fungicides can be used in conventional production of basil, in addition to the fungicides listed above. Quadris is the only one of these that is not permitted to be used in a greenhouse. Ranman is the first product labeled with targeted activity for oomycetes, the group of pathogens that includes those causing downy mildews. This label addition approved by EPA in 2012 has been approved in NY. There are several phosphorous acid (phosphanate) fungicides labeled for this disease, including ProPhyt, Fosphite, Fungi-Phite, Rampart, pHorsepHite, and K-Phite. This chemistry as well as Ranman was documented to be among the most effective in some university fungicide evaluations. Quadris is labeled for use on basil but not specifically for downy mildew; it also has been shown to be effective for this downy mildew. In states like NY where the target disease is required to be specified on the label, Quadris cannot be used without an approved FIFRA 2(ee) recommendation, which the applicator must possess when using (the one for NY can be downloaded at http://magritte.psur.cornell.edu/pims/current/).

To determine when to initiate a fungicide program and also when it is warranted to consider harvesting early to avoid losses to downy mildew, growers should not only routinely check the on-line spreadsheet to determine when downy mildew is occurring on basil nearby, but also regularly inspect their crop for symptoms. The cucurbit downy mildew forecasting web site (http://cdm.ipmpipe.org) might be useful for predicting when conditions are favorable for basil downy mildew since both pathogens likely have similar requirements for successful wind dispersal long distances (e.g. overcast skies) and subsequent infection (e.g. wet leaves or high humidity). Summer is not a time to forget about this disease: unlike most other downy mildew pathogens, e.g. the ones affecting lettuce and cruciferous crops, which stop developing in summer, the basil downy mildew pathogen seems to develop best under moderate to warm temperatures while also tolerating cool temperatures.

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Copper Fungicides-Organic Disease Management in Vegetables, continued from p. 8

Please Note: The specific directions on fungicide labels must be adhered to -- they supersede these recommendations, if there is a conflict. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

Other Practices. Practices that minimize leaf wetness and reduce humidity can contribute to control. These include planting where there is full sunlight and good air movement with rows parallel to the prevailing wind direction, maximizing plant spacing, and using drip irrigation. Humidity can be lowered in greenhouses by using circulating fans and lights and by increasing temperature. Observations of downy mildew occurrence in field and greenhouse basil plantings suggest that environmental conditions might significantly affect severity of downy mildew. Basil crops should be disked under or otherwise destroyed as soon as possible after last harvest, or when abandoned because of disease, to eliminate this source of inoculum for other plantings. A sunny day is the best time to physically destroy an affected crop because the disturbed spores will be killed by UV radiation. *-CDB*

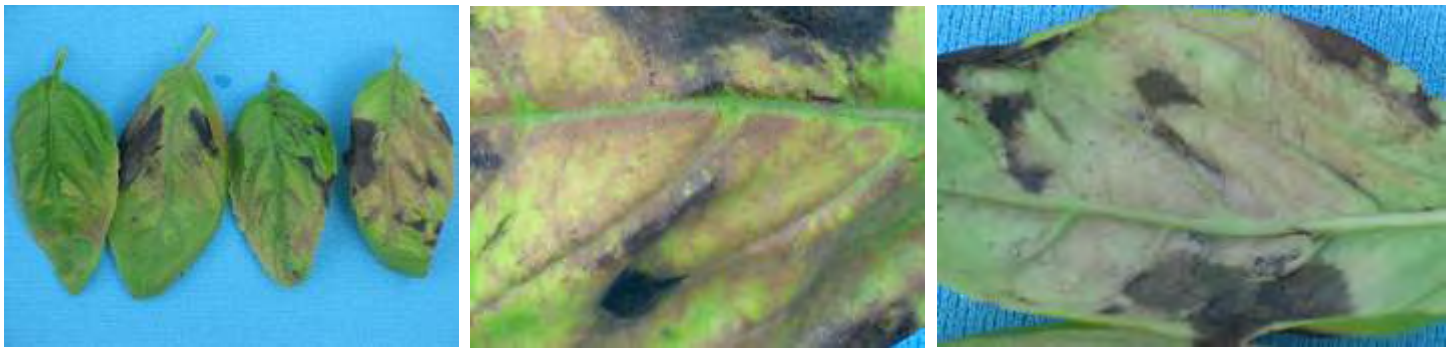

Fig.3: Injury to basil leaves from sunburn or other physiological cause resembles downy mildew but lacks the angular appearance and characteristic sporulation on the lower leaf surface.

Grower Twilight! Sept. 12, 5-6:30pm

Alternative Weed Control in Plasticulture Vegetables with Cover Crops: Research Findings, Challenges, and Opportunities

Migliorelli Farm, Rockefeller Lane at Linden Avenue, Red Hook, NY

Tomatoes and lots of rye.
Photo: Judson Reid, Cornell Vegetable Program

This event will be held at one of three current trials in NY where Judson Reid of the Cornell Vegetable Program is researching practical options for inter-row cover crops in plasticulture vegetables. The project aims to better understand cover crop options for growers seeking alternative weed control measures in their plasticulture inter-rows, while simultaneously reducing chances for soil-borne crop infections and enhancing soil conservation. Observing trials on several farms under differing circumstances has provided valuable insight into what aspects may lead to success or failure with an inter-row cover crop. Reid and Justin O'Dea at CCE Ulster County will share research findings, challenges, and opportunities observed to date. Bring your weed management questions and observations for discussion.

1.5 DEC credits in categories 1a, 10 & 23 available

Registration: $15 per farm, if registered by 9/9, $20 afterwards.

For registration information contact Carrie Anne at 845-340-3990 x311, or print/mail the form at http://www.cceulster.org/2013%20Migliorelli%20Twilight%20REVISED%20Reg%20Form.pdf

Grower Classifieds

Certified organic oats for sale, feed or seed.
$220/ 1000 lb. tote bag.
Pick-up, delivery available, add trucking. Contact Chris Cashen, 518-929-5782

Corn Trap Catch Numbers

Location	ECB-E	ECB-Z	Corn Earworm	Fall Armyworm	W. Bean Cutworm
N. Washington	6	6	1	0	0
C. Washington	2	2	0	0	0
N. Rensselaer	4	0	0	0	0
N. Columbia	1	0	3	8	0
Orange	3	4	0	0	0
N. Ulster	0	0	0	0	0
Clinton	0	0	0	7	6

Weekly and Seasonal Weather Information

	Growing Degree Information Base 50^{O} F			Rainfall Accumulations		
Site	**2013 Weekly Total** 8/21—8/27	**2013 Season Total** 3/1 - 8/27	**2012 Total** 3/1—8/27	**2013 Weekly Rainfall** 8/21—8/27 (inches)	**2013 Season Rainfall** 3/1—8/27 (inches)	**2012 Total Rainfall** 3/1—8/27 (inches)
Albany	**147.7**	**2042.0**	**2381.8**	**0.25**	**23.84**	**18.36**
Castleton	**137.3**	**2119.0**	**2562.4**	**1.23**	**22.00**	**17.61**
Chazy	**124.4**	**1882.6**	**2574.7**	**0.61**	**20.45**	**14.30**
Clifton Park	**137.9**	**2048.1**	**2337.3**	**0.37**	**23.00**	**21.18**
Clintondale	**152.3**	**2315.9**	**1939.5**	**1.18**	**NA**	**NA**
Glens Falls	**125.5**	**1786.9**	**2097.5**	**0.25**	**19.05**	**14.41**
Granville	**129.5**	**NA**	**2209.0**	**0.00**	**NA**	**18.76**
Guilderland	**137.5**	**1950.8**	**2179.0**	**0.13**	**6.83**	**6.56**
Highland	**144.8**	**2310.3**	**2525.9**	**1.10**	**21.76**	**23.13**
Lake Placid	**81.5**	**1257.8**	**NA**	**0.67**	**22.27**	**NA**
Montgomery	**143.7**	**2407.9**	**2258.5**	**1.38**	**23.70**	**NA**
Monticello	**100.8**	**1616.5**	**2173.5**	**0.00**	**0.28**	**1.49**