UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

Volume 30, Number 18 August 9, 2018

In this issue:

Crop conditions

It was the best of times, it was the worst of times. This is a difficult time in the season when so many crops are coming in, crews are shrinking, constant thunderstorms interrupt farm avtivities, and weeds have run amok. While some growers are complaining that this is the worst year they've ever had and threatening to quit farming, others remain optimistic. The season had a very cool start, then dry weather took hold and germination was bad in a lot of early direct seeded crops. The heat wave in July put a huge stress on heading summer brassicas in particular, causing crop failures. Heavy rains began in July and have not relented, starting the disease train rolling, and this week cucurbit downy mildew was confirmed in cucumber in Franklin County. With the heavy rains last week came high winds which caused lodging in sweet corn and peppers.

Zucchini as far as the eye can see.

But despite all this rain and pain, farmers are still harvesting A LOT! Crews have switched from a M-W-F harvest schedule to harvesting all day every day as root crops and bulk harvests are beginning, while eggplant, zuchinni, summer squash, and cucumbers continue to flood in. An optimistic farmer in Concord, MA writes:

"I've been here since 2005, and I've never experienced so little cucumber beetle pressure. I'm not sure how much of a difference it will make in overall yields of squash and cukes (and melons), but the cukes certainly look way better than usual. Also not sure what to attribute it to--I definitely don't think it's rotation. Brassica flea beetle pressure has been very light as well, though in that case, I think rotation played a role. Despite the cool spring, we put all our earliest plantings of warm season crops in on schedule, and were lucky to have our earliest ever corn, melons and tomatoes. Also, though we have observed some basil downy mildew, it hasn't wiped out any of our plantings the way it usually does--seems to have stalled out."

Join us for our 2018 Research Tour!

We are looking forward to our twilight meeting next week at the research farm in South Deerfield, where we too have been struggling in the heat and rain to keep up with weeds, but nonetheless we have some interesting results to share about brassica pest management, new cucumber varieties for downy mildew resistance, pollinator habitats, cabbage aphid and more—we hope some of you can make it out and enjoy a roundtable discussion over dinner! Please RSVP here, so we can order the correct amount of food: https://www.surveymonkey.com/r/X3JYR55

Pest alerts

Alliums:

Purple blotch has been diagnosed in leeks Hampshire Co., MA and on onions in Berkshire and Franklin Cos., MA and VT. For leeks that will not be harvested until October, consider a fungicide application (click here for options) to keep the disease from traveling down the neck and causing storage issues. Dying tissue can also be an entry point for bacte-

rial diseases. For onions: harvest in dry weather and avoid injury to the necks. Allow onions to cure properly before removing leaves. Store at 34-38°F and humidity 65-70% in a well-aerated cooler.

Brassicas:

Caterpillars (Imported cabbage worm, diamondback moth and cross striped cabbageworm): Fall brassicas are at risk and many farmers are treating now for caterpillars. It is important to get good coverage: use at least 50 gal spray volume/A, use drop nozzles where possible, and always use a spreader-sticker. Use selective materials (e.g. Bt products) to spare beneficials that help control aphids and caterpillars.

Thrips: As onions are being harvested, thrips are now moving into brassicas, where they affect leaf tissue and can get into the layers of cabbage heads where they may introduce bacterial diseases. Click here for the previous Vegetable Notes article "Scout for Onion Thrips in Brassicas".

Hollow stem due to boron deficiency and tip burn due to calcium deficiency were present in a field of summer broccoli and cauliflower in Franklin Co., MA. Wide plant spacing and high nitrogen or potassium levels have been shown to increase incidence of hollow stem. Soil moisture also influences the incidence of the disorder, due to its influence on plant growth rates. Boron deficiency occurs most frequently in sandy soils with low organic matter content as it is susceptible to leaching, and in soil with low moisture content. For tip burn, maintain optimum fertility with a phosphorous to potassium ratio of 1:1. Like blossom end rot which is also caused by calcium deficiency, tip burn is usually not due to an actual deficiency in calcium in the soil but rather by inconsistent soil moisture, and the plant cannot take up calcium that is there. Therefore, additions of calcium to soil or as a foliar application do not alleviate the problem.

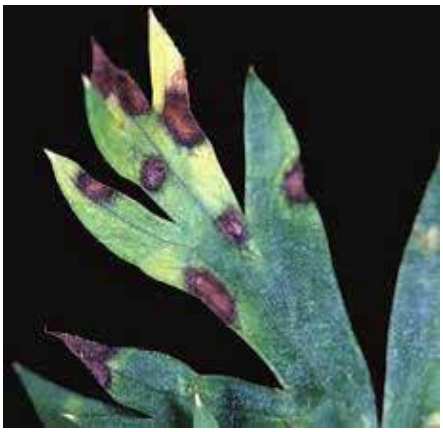
Beans:

Mexican bean beetle: Overlapping generations are now present in MA and NH. On one farm where *Pediobius* wasps were released early on, parasitized mummies are now being found. Wasps emerging from those mummies will help to control the second generation of beetle larvae.

Carrot:

Cercospora leaf spot was diagnosed on carrot in Franklin Co., MA. There are several leaf diseases that affect carrot foliage so get a diagnosis from the lab! This is important because treatments will differ if the disease is bacterial (i.e. *Pseudomonas* or *Xanthomonas*) or fungal (i.e. *Septoria* or *Alternaria*). See the UMass Diagnostic Lab sample submission form here: https://ag.umass.edu/services/plant-diagnostics-laboratory/vegetable-floriculture-diagnostics

Septoria leaf spot was diagnosed on parsley in Hampshire Co., MA this week. This disease also infects carrots.



Cercospora leaf spot on carrot. Photo: J. Ogrondick

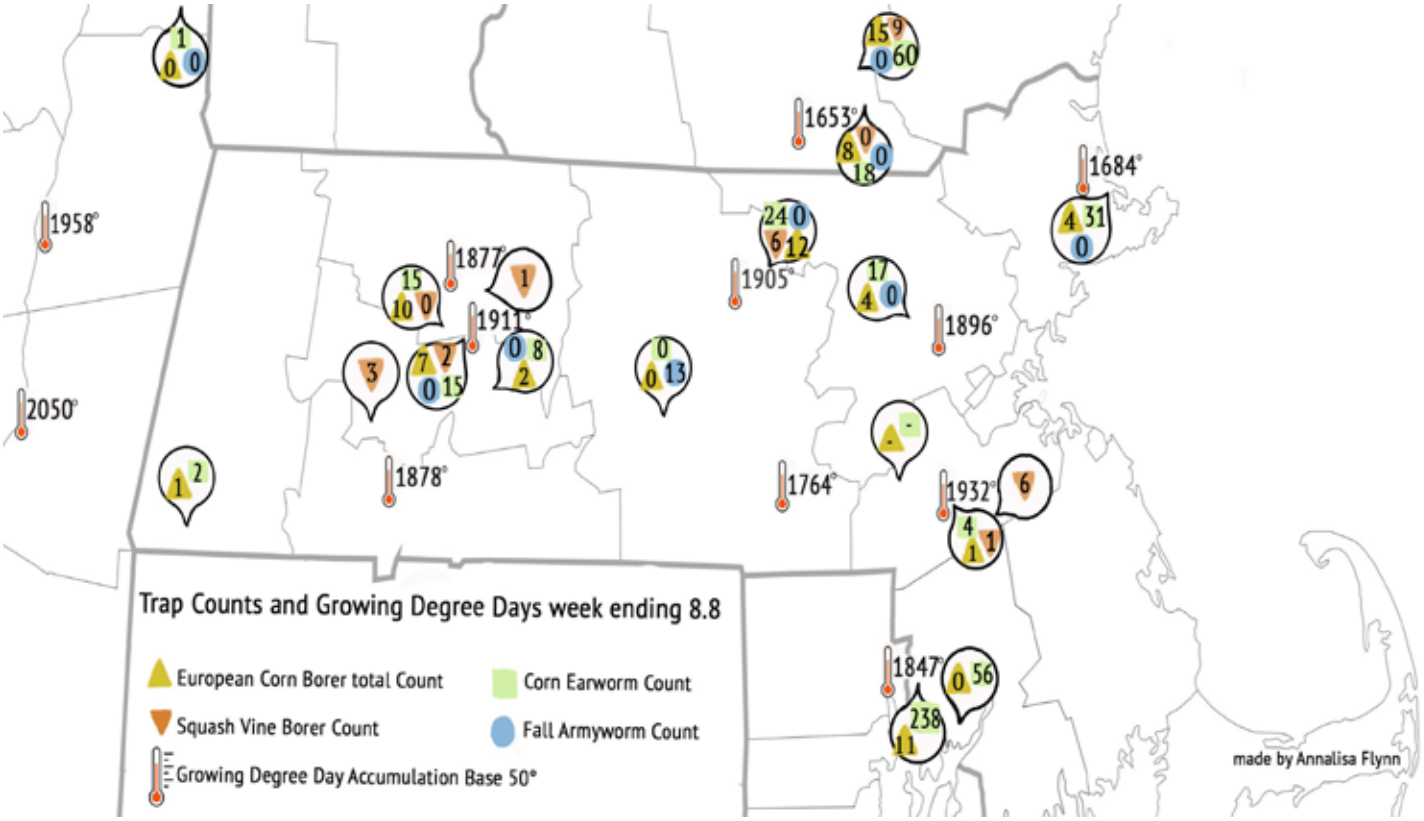
Cucurbits:

Alternaria on cucumber, Gummy stem blight (aka black rot) on winter squash, and Plectosporium in zucchini are all fungal pathogens of cucurbits which have been diagnosed in MA in the past week, all brought on by the wet weather across the state. Again, be sure to get an accurate diagnosis before selecting treatments.

Angular leaf spot is a bacterial disease that was found on winter squash and cucumber in Worcester and Hampshire Cos., MA respectively. From above, the damage looked suspiciously like downy mildew (yellowing confined by veins within the leaf).

Cucurbit downy mildew arrived in MA this week, and was diagnosed on the cucumber variety 'Nokya' in Franklin Co., MA. Time to switch over from protectant fungicides to oomycete specific materials in susceptible crops. So far this year the pathogen is affecting cucumber, butternut, giant pumpkin, acorn squash, summer squash, pumpkins, watermelon, and cantaloupe. For the most up-to-date recommendations see this page on Cornell University's "Vegetable MD Online."

Angular leaf spot on cucumber. Photo: G. Holmes



Solanaceous:

Colorado potato beetle: The next generation of CPB adults and larvae are active now and while they may not present a problem for potatoes, which are now starting to go down anyway and can sustain up to 70% defoliation before yield is affected, Jiló is very susceptible and fruiting now. Don't use the same insecticides on this generation as you did on the last generation to avoid resistance development on your farm.

Early blight and *Septoria* are rapidly taking down tomato plants and making people think they have late blight. If you have been spraying for late blight, however, you are probably also controlling early blight and *Septoria* as well. There are many effective fungicides listed for controlling these diseases, see the New England Vegetable Management Guide for recommendations.

Powdery mildew is being seen now in field tomatoes, due to the very high humidity.

Phytophthora capsici outbreaks are being reported in a variety of host crops including cucumber, squash, and this week in pepper in Hampshire Co., MA. See article this issue for information and recommendations.

Sweet Corn:

As you scout your corn, here is a helpful Sweet Corn Larval Pest ID Factsheet by Marion Zuefle of Cornell Cooperative Extension.

Corn earworm trap captures have jumped in NH and MA this week (see map). We have also found the larvae active in sweet corn AND in a few field tomatoes. This pest will also go for peppers occasionally. Most locations in the state are at a 3-day spray schedule now in early silking corn. No CEW have been reported in traps in northern VT or northern NY, lucky ducks!

European corn borer (ECB) and fall armyworm (FAW): Time to scout tasseling corn for ECB and FAW. While the second generation of ECB is tapering off, FAW is increasing.

Western bean cutworm eggs (see photo) are now being found in a Berkshire Co., MA field where pressure from this pest is higher. Eggs are white when young and turn purple-gray when they're about to hatch. Eggs have ridges like cantaloupe which are visible under a hand lens or dissecting scope. The threshold for this pest is only 3 egg masses per field.

Western bean cutworm eggs. Photo: J. Smith

MANAGING FALL DISEASES OF BRASSICAS

Fall, with its cooler temperatures and dewy mornings, is the time when diseases of brassicas can quickly take off and reduce yield and quality. That said, we have already been seeing some of these diseases start to spread rapidly, because of the frequent rains and also high daytime and low nighttime temperatures which lead to prolonged periods of leaf wetness in the form of dew. The following major diseases of brassicas share much in common—they can be seed-borne, they can survive in crop residues in soil for about two years, they are spread by wind, splashing water, and insects like flea beetles, and are favored by moist conditions. This means that the following preventive, cultural practices will go a long way in reducing the impacts of all the diseases described later in this article.

Variety selection. In some cases varieties exist that are totally resistant to a given disease and hold up well even under very high disease pressure. There are no varieties of any brassica crop that are totally immune to black rot or *Alternaria* (wouldn't that be a dream!), but there is a spectrum of disease tolerance to both of these diseases, and downy mildew as well. You have probably noticed on your farms that some varieties get more or less disease than others; plant breeders and researchers are aware of this too and are choosing varieties to take to market based on their observations and studying the performance of available varieties. A study done by Chris Smart at Cornell University showed differences in susceptibility to black rot of 35 cabbage varieties. The study showed that several varieties were extremely or very susceptible and 6 or 7 were "tolerant". Plant these tolerant varieties in fall, when environmental conditions typically favor disease, or in fields with a history of disease.

Start with disease free seedlings. All of these diseases are commonly introduced on infested seed. Either talk to your supplier to be sure the seed has been tested or, better yet, hot water treat your seed to eradicate bacteria, fungi, and oomycetes that may be present (you can do this at home with some simple equipment, or use the UMass Hot Water Seed Treatment service). When raising seedlings in the greenhouse, avoid overwatering and encourage air flow to reduce leaf wetness. Monitor transplants in the greenhouse and remove any symptomatic plants.

Plant into a clean field. Rotate out of brassicas (including weeds like shepherd's purse, wild radish, and field pennycress) for 2-4 years. Any amount of rotation you can do will help and the further the better, as these diseases can be dispersed by wind and insect feeding. Chopping and burying infested residue quickly after harvest will shorten the period of time the organisms persist in the soil (e.g., avoid leaving diseased Brussels sprout stalks standing in the field through the winter; mowing them is better than nothing if you can't disk them in). Manage cull piles well so that they do not become sources of inoculum.

Reduce leaf wetness. All of these diseases require moisture to grow and spread. Increase plant spacing so plants will dry off more quickly and so the pathogens can't spread as easily from plant to plant. If overhead irrigation is necessary, or when watering in the greenhouse, water on a sunny day when leaves will dry quickly.

Control insects and remove weeds. Flea beetles can move fungal spores and bacteria from plant to plant and field to field. A study by Helene Dillard at Cornell University showed that spores of *Alternaria brassicicola* are present on flea beetles' bodies, in their mouths, and in their feces, and that flea beetles actually concentrate *Alternaria* spores in their mouthparts when they clean their antennae. The insects move from plant to plant, basically injecting spores and bacteria into wounds they create through their feeding. Therefore, reducing flea beetle pressure will also reduce the spread of diseases through the field. Similarly, cruciferous weeds can harbor diseases and act as bridges between fields and between seasons. Weeds also crowd the crop, increasing moisture and leaf wetness and reducing efficacy of sprays.

Chemical control. There are many effective pesticides to control these diseases. Please see the New England Vegetable Management Guide for chemical recommendations. Copper products and plant defense activators like Actigard or Regalia are the best choices for managing black rot. Avoid using excessive pressure when spraying for black rot, as this can cause abrasions and wounds on leaves through which the bacteria can enter the plant—use only enough pressure to get good coverage. Many OMRI-approved fungicides are labeled for these diseases, but those tested in our studies have not shown good efficacy for *Alternaria*.

Black Rot is one of the most devastating diseases of brassica crops, and can result in high losses of yield and quality. The bacterium, *Xanthomonas campestris* pv. *campestris*, plugs the water-conducting tissue of the plant with xanthan, a mucilaginous sugar, causing leaf yellowing and wilt. Seedlings are commonly affected but symptoms can appear at any growth stage; infected plants may appear symptomless. The most common and characteristic symptom is a yellow, V-shaped le-

sion that extend from the leaf margin toward the base of the leaf (see photo to right), caused by bacteria entering through guttation droplets that form at the hydathodes. Lesions can also occur mid-leaf, as darkened dead patches of tissue between the veins, where wounding from insect feeding, hail, or mechanical injury has occurred. The pathogen may move into the plant vasculature, blocking the normal flow of water and nutrients. Infected veins turn black as they are plugged with xanthan. Blackened veins may also appear in root crops like rutabagas even though foliar symptoms may not be present. On heading crops, infection may spread into the leaves of the head and is often followed by invasion by soft-rotting organisms.

Black rot on cabbage.

Black rot is commonly transmitted by seed, and a seed lot with as little as 0.03% infected seed can cause an epidemic. The bacteria can persist in infected plant debris for up to two years, but can only survive for 40-60 days in the soil in the absence of host tissue. Disease development is favored by warm, wet weather and is spread within the field by splashing water, wind, equipment, workers, and by insects (e.g. flea beetle feeding). *X. campestris* pv. *campestris* can be spread long distances or introduced into new areas by infected seeds and transplants.

Alternaria leaf spot is a fungal disease that affects all cultivated brassicas. The disease can be caused by several fungi in the genus *Alternaria*, but the most damaging species in vegetable brassicas are *A. brassicae* and *A. brassicicola*. The disease can spread in storage so management is especially important for cabbage and other storage crops and crops should be inspected for early symptoms before storing.

Alternaria leaf spot. Photo: G. Holmes

The initial symptoms of Alternaria leaf spot are small black dots surrounded by chlorotic haloes. As the disease progresses lesions expand into characteristic, dark brown to black circular leaf spots with target-like concentric rings. The centers of lesions often turn brown and crack or fall out, giving the leaf spots a shot-hole appearance. Individual spots coalesce into large necrotic areas and leaf drop can occur. Lesions can occur on petioles, stems, flowers, flower pedicels, and seed pods. Brussels sprouts can be rendered unmarketable by numerous small spots on the buds. Brown, sunken spots on heads of broccoli and cauliflower can make those crops unmarketable.

Alternaria species overwinter primarily in diseased crop debris. Lignin-rich stalk tissues can persist in the soil for over two years, and the fungi can remain active on that tissue as long as it is present. Disease development is favored by cool temperatures (60-78°F) and 12 hours of at least 90% relative humidity. The main means of introduction into new areas is on infested seed. However, once the disease is established on a farm, spores can spread easily between crops on wind, splashing water, equipment, and workers.

In 2009, a Brussels sprout variety trial was conducted by the UMass Vegetable IPM Program. Seven varieties were evaluated—Vancouver, Franklin, Nautica, Diablo, Dimitri, Roodnerf, and Oliver. Among these varieties, Oliver and Franklin showed significantly more *Alternaria* damage than the other cultivars. There are many fungicides with efficacy against Alternaria leaf spot including Quadris, Endura, and Bravo among others—please see the New England Vegetable Management Guide for recommendations.

Downy mildew caused by the fungus *Hyaloperonospora parasitca*, is an important disease of broccoli, collards, kale, cabbage, cauliflower, and Brussels sprouts, as well as root crops such as rutabaga, turnip, and radish. We also see it a lot in fall brassica greens plantings. Different downy mildews affect different crops groups; they are all unique and very host specific. This means that if you have cucurbit downy mildew, it will not infect your brassicas, and vice versa. Infection can occur at any stage of growth. On seedlings, slighty yellow patches appear before whole leaves and cotyledons turn

yellow and drop. Early infections can also be symptomless until seedlings are transplanted to the field and conditions become favorable. Irregular, angular yellow to brown spots develop on both the top and bottom of the leaf and a characteristic grayish-white, fluffy growth on the undersides of leaves appears. In broccoli and cauliflower, the first symptom is often darkened flower head stalks, or stalks with black streaks. Dark brown areas will develop internally in curds or floral buds. In cabbage, internal darkening and purplish spots appear in the inner layers of the head or move upward in the head from stem infections. The disease can spread in storage and infected plants are susceptible to secondary infection with soft rot bacteria, resulting in a stinky puddle of rotten cabbage.

Brassica downy mildew on broccoli leaves.

Unlike other downy mildews that blow in from afar each year, *H. parasitica* can overwinter as thick-walled resting spores, called oospores, in the soil or crop debris. These sexual spores can survive in the soil for extended periods and produce asexual spores when conditions are moist and cool, especially at night. Other sources of initial inoculum are infested seeds, and cruciferous weed hosts. Disease development is favored by abundant moisture on leaves provided by dew, drizzling rain, or heavy fog, and by temperatures of 50-60°F. Sporulation, germination, and reinfection can occur in four to five days. Sporangia (secondary, asexual spores) are spread throughout the field by wind, splashing rain, and by feeding insects. Varieties of broccoli with tolerance to downy mildew have been developed; our sources list Marathon and Arcadia among these.

--Written by Susan B. Scheufele

PHYTOPHTHORA BLIGHT: CONSIDERATIONS FOR FALL

Phytophthora blight, caused by the soil-dwelling oomycete *Phytophthora capsici*, has a wide host range including all cucurbits, tomato, eggplant, pepper, beans, and some weeds (purslane, American black nightshade, Carolina geranium). Warm wet conditions with frequent rainstorms, like the recent weather, favor disease development. Symptoms vary by crop and may be easily confused with other diseases or issues such as water-logging. Be on the lookout and submit suspect plants or fruit to the diagnostic lab in order to get a proper ID. This will prevent you from moving the pathogen around your farm and from planting susceptible crops in infested fields in future years. There is also a lot you can do now to manage the disease on your farm.

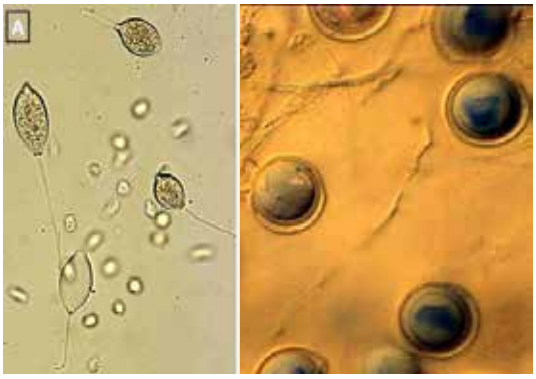
Phytophthora fruit rot in pumpkin.
Photo: M. T. McGrath

Many of you are probably all too familiar with the symptoms of Phytophthora blight on cucurbit fruit but you may not know that many other vegetable crops are also susceptible, though they may exhibit different symptoms. Symptoms of *P. capsici* on squash fruit are firm, round, water-soaked lesions that develop white sporulation that resembles powdered sugar under warm, moist conditions. Cucurbit plants, especially non-vining varieties, can also develop symptoms of crown rot where whole plants or vines wilt suddenly and eventually the whole plant collapses. Symptoms on pepper are distinctly different, as plants become infected with *P. capsici* via their roots and develop a crown rot that causes darkening of roots and stems and permanent wilt of foliage, while stems remain rigid. Pepper fruit remains attached to the upright stems but may eventually develop dark, water-soaked lesions which can spread to the whole fruit giving it a soft, wrinkled appearance. On tomato, *P. capsici* causes 'buckeye rot' on fruit where it comes in contact with the ground. Small brown spots on fruit grow into large, round or oblong lesions with alternating rings of light and dark-brown discoloration. The lesions are firm, with smooth margins but eventually become soft. In recent years, Phytophthora blight has been confirmed on lima and snap beans, crops which had previously been considered non-hosts. Bean pods develop water-soaked lesions followed by diffuse, white sporulation. Bean stems and crowns can also be affected and plants often collapse in low-lying areas of fields.

P. capsici persists in soil for many years as thick-walled resting spores called oospores. Long-lived oospores may also be spread throughout the field and the soil profile during tillage or cultivation, and they can be spread from field to field or farm to farm on infested soil clinging to tractor or truck tires, harvest buckets, workers' boots, or even discarded infected fruits. The oospores germinate to produce asexual, short-lived sporangia, which are produced on sporulating fruit lesions. These sporangia germinate directly or release 20-40 zoospores—one infected spaghetti squash is estimated to contain 44 million sporangia with the potential to release 840 million zoospores (Hausbeck and Lamour, 2004). This accounts for the rapid, above-ground spread of disease within a field or a season via surface water, rain, or splash. Outbreaks often start in low-lying or poorly drained areas of fields where zoospores are released in saturated soils and swim to find their hosts. Growers often assume that stunting or death of plants in these areas of the field is caused by waterlogging, but infection with *P. capsici* may be the real cause. Importantly, water run-off from an infested field may contaminate surface water sources used for irrigation. This has been well documented in irrigation ponds and rivers in NY and MI.

Brown lesions of Phytophthora blight on pepper stems. Photo: Long Island Horticultural Research & Extension Center

During the busy harvest period, plan on harvesting from uninfested fields before you go into infested fields with tractors, trucks, workers, and bins. Take time to wash equipment when moving between fields to remove soil or crop residues that may contain sporangia or oospores. Do not leave fruit in fields or in cull piles, as a single fruit infected with both mating types of *P. capsici* can contain thousands of oospores that could establish populations in new fields or contribute to increasing the population size and diversity within an already infected field. If the infested area is large and plant material cannot be removed from the field, make sure to till it under deeply. Remember that there is a 2-6 day lag period between infection and symptom expression so if you suspect *P. capsici* is present, hold fruit for a few days before sending large wholesale shipments out to avoid their being returned due to rot.



Microscopic structures of P. capsici. Left: Lemon-shaped sporangia, and swimming zoospores. Right: Oospores. Photos; M. Babadoost.

If you do have *P. capsici* present on your farm, there are cultural practices that can be effective in helping to manage the disease:

- **Crop rotation:** A minimum crop rotation of 3-4 years is recommended, although fields that have been out of susceptible crops for >5 years have had outbreaks in recent years. Keep in mind that every year you rotate an infested field to a non-host crop the number of spores that survive to the following year will be reduced, so any rotation you can do will help. The host range of *P. capsici* is broad but the list of non-hosts includes brassicas, carrots, onions, and grasses. Tolerant pepper varieties are available and should be planted when the disease may be present and a susceptible crop must be planted before the end of the minimum rotation period. Similarly, pumpkin varieites with hard shells, such as 'Lil Ironsides' or 'Apprentice' have been shown to be significantly less susceptible to disease than similar varieties with conventional, soft rinds.
- **Cover crops** can be used to help mitigate the effects of *P. capsici*, as the addition of soil organic matter stimulates beneficial microbes. A healthy soil microbial community can reduce plant pathogen activity by outcompeting them for space and nutrients, by direct parasitism of plant pathogens, by producing antibiotic compounds that slow pathogen growth, and by stimulating the plants' natural defense systems.
- **Biofumigation:** Research suggests that brassicaceous cover crops (especially mustards and canola) release several compounds and gases as they break down that are toxic to microorganisms, and *P. capsici* specifically. This "biofumigation" process kills plant pathogens and beneficial microorganisms repopulate the soil quickly. Successful reduction in pathogen population size through biofumigation requires large volumes of brassica residues which must be incorporated shortly before planting and need to be chopped, rototilled, cultipacked, and irrigated. Allelopathy is also a concern for some sensitive crops when using this system.

Fungicides can be used effectively and economically to reduce the impact of disease on yield, though none will provide sufficient protection to be used as the sole management strategy—they must be part of an integrated program including cultural controls. For many row crops, applying fungicides through trickle irrigation (if allowed per product label) can help control crown rot, but in vining crops, foliar applications will be needed later to protect developing fruit, which may be resting on infested soil. Foliar applications can be difficult because of dense canopy. Air-assisted nozzles may help improve coverage. *P. capsici* has the ability to develop resistance to targeted fungicides, so resistance management strategies like mixing targeted fungicides with protectant fungicides and rotating modes of action with every application, are extremely important. Ridomil was previously frequently used to drench plants in the early season and some populations of *P. capsici* have become resistant to this product. Instead, you can treat transplants or seedlings with a drench treatment of a phosphorous acid fungicide such as ProPhyt, K-phite, or Fosphite, which have been shown to be effective as soil or foliar applications. Effective, targeted materials include Ranman, Forum, Tanos, and Gavel.

Collapsed squash plants in a field infested with P. capsici.

- **Ranman** can be used at 2.75 fl oz/A beginning before symptoms occur for a maximum of 6 applications.
- **Forum** can be used on all cucurbit crops at 6 oz/A every 5 to 10 days, depending on disease pressure, beginning when plants are 4-6 inches high for a maximum of 30 oz or 5 applications. It must be used in a tank mix with an effective fungicide that has a different mode of action (non-Group 40 fungicide).
- **Tanos** is labeled at 8-10 oz/A for a maximum of 4 applications. Tanos must be tank-mixed with a copper fungicide and a fungicide containing maneb or mancozeb. Follow a strict alternation with no consecutive applications of Tanos.
- **Gavel** is labeled for use at 1.5–2.0 lb/A every 7 to 10 days or when conditions are favorable for disease for a maximum of 8 applications.

Dr. Meg McGrath of Cornell University calculated the cost/A of applying these materials (numbers are from 2015), listed in the table below. Meg suggests the following program for effective control: Begin with a drench treatment of ProPhyt to transplants, then alternate among the following applied to foliage (5 to 10 day spray interval; can be extended under dry conditions):

1. Forum + copper fungicide when plants are 4-6 inches high or at 2-leaf stage
2. Ranman + copper fungicide
3. ProPhyt, Phostrol or Fosphite
4. Tanos + copper fungicide + maneb or mancozeb
5. Gavel for cucurbit crops other than pumpkin

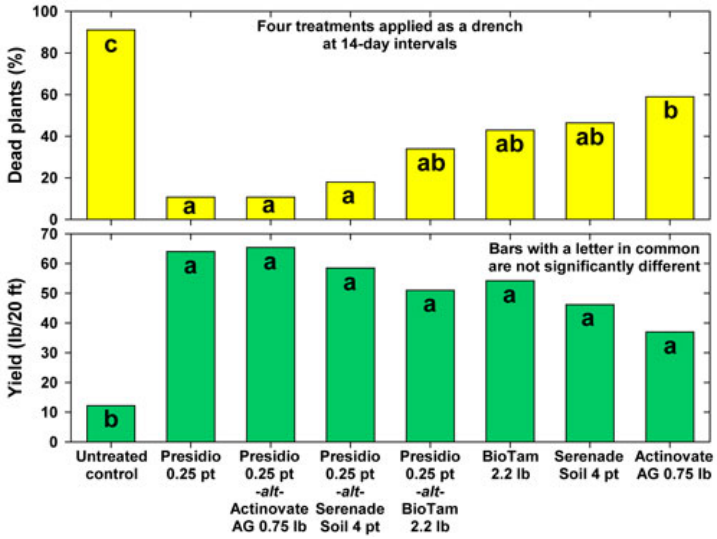
Product	Cost/Acre/Application
Ranman	$16.75
Forum	$8.90
Tanos	$10.30
Gavel	$7.75-$10.30

Meg also says that Presidio and Revus are other materials that would make good choices for managing Phytophthora blight in cucurbit crops. Be aware, though, that while Phytophthora blight and cucurbit downy mildew are both caused by the same type of pathogen (oomycetes) and thus are sensitive to similar targeted fungicides, Presidio and Revus are no longer recommended for cucurbit downy mildew because that pathogen has developed resistance. These materials do still work for Pytophthora blight and are also labeled for pepper and eggplant.

For organic growers, there are several soil-applied materials labeled for use in controlling *Phytophthora* species including *P. capsici*, and while they may not work as well as targeted synthetic fungicides, they can reduce disease severity and improve yield. Dr. Mary Hausbeck at Michigan State University is a Pytophthora blight expert who has done field trials looking at efficacy of various fungicides. In 2013 she evaluated some OMRI-approved biofungicides and the results were published in the MSU Extension News for Agriculture newsletter and can be found online here. She found BioTam (*Trichomderma*), Serenade Soil (*Bacillus* spp.), and Actinovate Ag (*Streptomyces*) all significantly reduced plant death and increased yield relative to the untreated control Each was applied as a soil drench at the base of yellow squash plants

grown on black plastic. When she used these biofungicides in rotation with a synthetic fungicide, Presidio, she got even better control, indicating these materials could be used as rotational tools in conventional spray programs.

Management of Phytophthora begins with prevention. Be aware, informed, and proactive. If infections occur, a program that includes multiple control strategies can reduce the pathogen population size over time.



Information and figure from:

- Hausbeck, M.K. & K.H. Lamour. 2004. Phytophthora capsici on vegetable crops: research progress and management challenges. Plant Disease. 88(12:1292-1303.
- Hausbeck, M.K., and Krasnow, C. 2014. "Watch for Phytophthora on vine crops." July 18, 2014.
- McGrath, M.T. "New Developments in Managing Phytophthora Blight in Cucurbit Crops." Vegetable MD Online, Cornell Univeristy.

--Written by Susan B. Scheufele, UMass Vegetable Extension

Massachusetts Tomato Contest to be Held on August 21st

The 34th Annual Massachusetts Tomato Contest will be held in the KITCHEN at the Boston Public Market on Tuesday, August 21st. Tomatoes will be judged by a panel of experts on flavor, firmness/slicing quality, exterior color and shape. Always a lively and fun event, the day is designed to increase awareness of locally grown produce.

Farmers who want to submit entries can bring tomatoes to the market between 9:00 am and 10:45 am on August 21st or drop their entries off with a registration form to one of the drop off locations on August 21st. Drop off locations include sites in Amherst, Northboro, Topsfield and North Easton. These tomatoes will be brought in to Boston on Tuesday.

For the complete details, including drop off locations, contest criteria and a registration form, go here.

The 34th Annual Tomato Contest is sponsored by the Massachusetts Department of Agricultural Resources, New England Vegetable and Berry Growers Association and Mass Farmers Markets in cooperation with the Boston Public Market and The Trustees.

Events

UMass Extension Vegetable Program Research Tour and Round Table

Featuring presentations on the following topics:

- Cucurbit downy mildew resistance in cucumbers - Sue Scheufele
- Pollinator protection in butternut squash - Sue Scheufele
- Mulches for flea beetle control in brassicas - Sue Scheufele
- Natural predators of cabbage aphid - Sue Scheufele
- Corn genetics - Madelaine Bartlett
- Organic fertilizer effects on yield and nitrate in lettuce varieties - Omid Zandvakili
- Fusarium wilt of basil - Kelly Allen
- Bee size and disease transmission - Lynn Adler

- State incentives for solar photovoltaic arrays on farms - Zara Dowling & River Strong

When: Tuesday, August 14th, 2018 from 4:00 PM to 7:00 PM (Rain date: August 16th)

Where: UMass Crop and Animal Research and Education Farm, 89-91 River Rd., South Deerfield, MA 01373

CLICK HERE TO REGISTER: https://www.surveymonkey.com/r/X3JYR55

Click here to request special accommodations for this event.

Reduced Tillage and Transplanters for Vegetable Farmers

Featuring: Farmer Jim Ward and his reduced till vegetable cropping systems which he has practiced for over 10 years with the help of an Unverferth Deep Zone Tiller, Davidian Farm's two-row Monosem vacuum precision planter mounted with Dawn Biologic roller crimpers (first ones in the state!), the UMass Research Farm's grain drill and roller crimper, and Brookdale Fruit Farm's new line of no-till transplanters from Checchi-Magli. There will also be demonstrations on Soil Health with Maggie Payne, Soil Scientist at NRCS.

When: Tuesday, August 28th, 2018 from 4:00 PM to 7:00 PM

Where: Ward's Berry Farm, 614 S Main St., Sharon, MA 02067

CLICK HERE TO REGISTER: https://www.surveymonkey.com/r/XF8JQYD

Click here to request special accommodations for this event.

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Vegetable Notes. Katie Campbell-Nelson, Genevieve Higgins, Lisa McKeag, Susan Scheufele, co-editors.

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