



UMASS  
EXTENSION



# Vegetable Notes

For Vegetable Farmers in Massachusetts

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## CROP CONDITIONS

Wherever double crops are part of the marketing plan, second seedlings are being made or are in the seedling stages. This includes transplants of lettuce, onion, spinach, kale, broccoli, cabbage, summer squash, and seedlings of beans, cucumber, Brassica greens, cilantro, and other frost hardy herbs. The big fruiting crops – tomato, pepper, eggplant, melon -- are producing fruit steadily, and growers are dealing with some of the disease, insect, and physiological problems to try to maintain quality. Harvest has moved into second plantings of tomatoes and third plantings of summer squash (try to find time to till the old crops under!). Farmers markets and farm stands are busy and CSA's are humming along with big shares to offer their members. Customers are starting to ask for fall crops such as butternut squash and pie pumpkins. In fields that were started early, there are ripe squash and pumpkins to be found. The relatively dry weather has kept diseases from blooming, though downy mildew has spread north and west from southeastern Massachusetts in central MA, and threatens cucurbit crops that are not fully mature. Sunscald is also an issue wherever crop canopy is thin above tomato, pepper, pumpkin and winter squash. Protect canopy as much as possible, or harvest as early as possible to avoid losing fruit to sunscald. Fields are opening up after early corn and other crops, and it's a great time to plant fall oats, field peas, or even sorghum sudangrass if you want to pull up remaining nitrogen and return to the field early next spring!

We hope to see you at the Vegetable Crops Field Day next Tuesday, August 21, 4-7 pm in South Deerfield.

## CUCURBIT UPDATE

Powdery mildew is pretty much everywhere, in all vine crops. *Plectosporium* has been found on most farms that we visit. *Phytophthora capsici* is popping up here and there. In the past week, downy mildew has been reported and confirmed on cucumber in Plymouth County, MA, Worcester County MA, and Tolland County, CT. It is likely to be widespread through southeastern, coastal New England. We have not seen it in the Connecticut Valley yet. The North Carolina Downy Mildew forecasting website reports as follows (updated Tuesday 8/14) for New England: *Conditions are unfavorable for survivable transport and deposition today and tomorrow. Wednesday's event travels in a similar manner to today's event. Low Risk to cucurbits near the source and along the forecast pathways Tuesday and Wednesday.* Rain events are needed to create conditions favorable for spore transport, deposition, and germination. Nonetheless, given its distribution at present, we recommend that cucurbits throughout

Massachusetts be protected using materials that will prevent or control downy mildew.

This is the time of year when cucurbit diseases become extremely difficult. Figuring out what is causing the symptoms you see is difficult, and deciding what to do about it is difficult. We encourage you to use the resources available to help you take your crop through to a successful harvest. That includes finding out what disease is present so you don't waste time and money with products that won't work. That's what the Disease Diagnostic Clinic is there for. Grant funds obtained by the NEVBGA and UMass Veg Program from EPA will help fund the cost of cucurbit diagnostics –so it's a great time to use it! (413-545-3209).

Fungicide programs probably need to address both downy and powdery mildew, as well as black rot and *Plectosporium*. DO NOT use the same fungicide group for successive applications. Rotate systemics among classes, and always use a protectant (chlorothalonil, maneb, or sulfur) when using a systemic. Tanos, Gavel, and Prophyte are recommended for downy mildew, while Pristine, Procure or Nova, and Sulfur are recommended for powdery. In some cases, downy mildew control can be integrated with sprays selected for powdery mildew; for example, Pristine is effective against both.

Keeping the vines healthy is important to provide energy and nutrients to the fruit and also to provide good leaf canopy and protect the fruit from sunburn. When leaf canopy disappears, severe sunburn on pumpkins, watermelon, cucumbers, summer squash, and cantaloupe may occur. It is discouraging to lose fruit to sunburn when it is healthy in other respects.

In Ohio, Extension newsletters are reporting that yellow vine decline has shown up in pumpkin fields with high populations of squash bug which vectors the disease. The disease takes at least 28 days until symptoms are seen. This disease has occurred in Massachusetts, though is rare. However we have seen consistently high populations of squash bug – adults, eggs, and now nymphs – in fields around the state, so it is worth observing for symptoms and contacting the Disease Diagnostic lab.

Cucurbit yellow vine disease is caused by the bacteria, *Serratia marcescens*. The bacteria survives the winter in squash bugs and is spread to the young plants in the spring when the bugs colonize and feed on cucurbit crops. Young seedlings in the first true leaf stage of development are more susceptible to disease transmission than older seedlings.

Spread of CYVD between plants within the field is not thought to contribute much to disease severity because the progression of symptoms is usually very slow. The bacteria reside and multiply in, and eventually clog the phloem tissue of the

plant vascular system. Usually symptoms are not detected until just prior to harvest. However, some symptomatic or asymptomatic immature plants may collapse suddenly in the middle of the season or just after fruit set. Typically, all the leaves turn yellow within a few days, starting about a week or two before harvest. Terminal leaves stand erect, fail to expand, and the margins curl inwards. Older leaves develop scorched margins and may die. The phloem in the crown and lower stem turns honey-colored. Eventually, the root begins to decompose, a process that is hastened by secondary rot organisms, and the whole plant begins to decline and die. Watermelon fruit turn yellow as the leaves begin to discolor. Other fruit usually fail to show symptoms.

Control of this disease depends on early season control of squash bugs. If you think you may have this disease, contact Bess Dicklow at the disease diagnostic clinic at 413-577-3209.

--Ruth Hazzard. *CYVD resource: Jude Boucher, Univ. of CT. For more detail: Cucurbit Yellow Vine Disease (CYVD) In Connecticut, posted at <http://www.hort.uconn.edu/ipm/veg/htms/cu-crbinct.htm>*

## **BLOTCHY RIPENING IN TOMATOES**

Blotchy ripening and graywall have become problems on some tomato crops. Blotchy ripening gets its name because the fruit ripen unevenly, with patches that don't ripen or do so after the rest of the fruit are over-ripe. Graywall is aptly named because they walls or skin of the tomatoes appear somewhat gray in color. There is also a dark brown necrosis in the wall of the tomatoes which is apparent when cut. These two disorders are believed to same, but with different symptoms. There are varietal differences in susceptibility and the way the symptoms appear. On some varieties the symptoms appear as graywall, while on others they appear as blotchy ripening.

The exact cause of these problems is not known, but environmental factors and perhaps disease may trigger the symptoms. Anything that suddenly stops or slows plant growth may induce this problem. This can be an excess or lack of moisture, low or hot temperatures, a period of cloudiness, or a nutrient problem such as insufficient nitrogen or potassium. Tobacco mosaic virus (TMV) may also trigger these symptoms. Typically the symptoms appear about two or three weeks after the event.

Some of these environmental factors are beyond your control, but it is practical to maintain proper fertility and adequate soil moisture and prevent TMV.

—John Howell, UMass

## **ALTERNARIA DISEASES OF BRASSICAS**

*Alternaria* diseases of Brassicas tend to grow worse as fall approaches, and can threaten the marketability of both leafy greens and heading crops. Three *Alternaria* species cause serious damage to brassicas: *Alternaria brassicicola*, *A. brassicae*, and *A. raphani*. *Alternaria brassicicola* and *A. brassicae* infect broccoli, Brussels sprouts, cabbage, cauliflower, Chinese cabbage, kohlrabi, kale, rutabaga, and turnip. *A. raphani* is most often found on radish, but can infect other brassica crops.

The most common symptom of *Alternaria* diseases is yellow, dark brown to black circular leaf spots with target like, concentric rings. Lesion centers may fall out, giving the leaf spots a shot-hole appearance.



*Alternaria* lesions on the underside of a broccoli leaf.

Individual spots coalesce into large necrotic areas and leaf drop can occur.

Lesions can occur on petioles, stems, flowers, flower pedicels, and seed pods. Pod infection causes distortion, premature shattering, and shriveled, diseased seed that germinate poorly.

*Alternaria* species are simple parasites that survive saprophytically outside the host primarily in diseased crop debris. Resting or overwintering spores (chlamydo spores, microsclerotia) have been reported. The disease is favored by warm temperatures (60-78° F) and 12 hours of relative humidity of 90 % or more. The fungi sporulate profusely and are spread throughout fields by wind, splashing water, equipment, and workers. The main means of introduction into new areas is on infested seed. However, spread from one infected crop into nearby crops occurs easily once the disease is established on a farm.

### **Management:**

- Buy certified, disease-free seed or treat seed with hot water.
- Practice long rotations with non-brassica crops.
- Incorporate diseased plant debris into the soil immediately after harvest.
- Eliminate cull piles.
- Control brassica weeds.
- Avoid overhead irrigation during head development.
- Keep seedbeds disease-free to prevent the spread of disease and locate seedbeds so as to avoid wind-borne inoculum.
- Control of *Alternaria* leaf spot on cabbage heads in the field is necessary for long-term storage.
- Practice in-season rotation: avoid planting succession crops in close proximity; rotate late season crops to new fields.



*Alternaria* spreads across the leaf surface of Komatsuna, a type of Brassica rapa.

### **Chemical recommendations:**

**azoxystrobin (Amistar):** 2-5 oz/A (0 dh, REI 4h). Apply prior to disease development and continue at 7-14 day intervals. Do not make more than one application of Amistar before alternating with a fungicide with a different mode of action.

**chlorothalonil (Bravo Ultrex 82WDG):** 1.4 lb/A (7 dh, REI 12h). Apply at the first sign of disease and repeat at 7-10 day intervals.

**cyprodinil plus fludioxonil (Switch 62.5WDG):** 11-14 oz/A (7dh, REI 12h). Apply at the first sign of disease and repeat at 7-10 day intervals. Only turnip varieties harvested for their leaves may be treated.

**maneb (Maneb, Manex):** Rates vary depending on the formulation. (7 dh, REI 24h).

*-Bess Dicklow, UMass Extension*

## **PRODUCE SAFETY AT THE FARM** **MARKET-A GUIDE FOR FARMERS AND** **SELLERS**

Consumers don't come to farmers' markets to get a dose of E. coli or salmonella. But if farm markets turn out to be a source of these or other causes of foodborne illness, consumers will quickly choose to get their fresh produce elsewhere.

The Centers for Disease Control and Prevention estimates that 76 million Americans a year suffer a case of foodborne illness, although many mild cases go undiagnosed. Thousands of cases are more serious, though: According to the CDC, "there are 325,000 hospitalizations and 5,000 deaths related to foodborne diseases each year. The most severe cases tend to occur in the very old, the very young, those who have an illness already that reduces their immune system function, and in healthy people exposed to a very high dose of an organism." In other words, every customer at your farm market is a potential victim of foodborne disease. The safety precautions you take could save a life, and your business.

Food safety experts with Ohio State University Extension and the Ohio Agricultural Research and Development Center suggest paying special attention to three areas: transportation, product handling, and sale and display. In each area, consider proper personal hygiene, temperature control, cross-contamination prevention, and cleaning and disinfection.

These are especially important guidelines when handling fresh produce, much of which will be eaten raw. Other types of fresh food, such as meat and poultry, are usually thoroughly cooked before eaten, so any microorganisms they harbor are killed. That's why foods that are not typically cooked before being consumed deserve special handling.

Remember: Bacteria that cause foodborne illness can show up anywhere. Even if you grow your goods organically or have a small operation with just family members involved, your product is as much at risk as in a large operation. It's just common sense -- and good business sense -- to take all precautions possible to prevent the foods you sell from becoming contaminated. Here are

some guidelines:

**Transportation:** • Be sure to transport food in containers that can be wrapped, covered and otherwise protected from contamination, and that can be cleaned and sanitized before each use. Plastic bins would be an ideal choice; don't use wooden crates or used cardboard boxes, which might harbor disease-causing bacteria and pass it along to the food items inside.

- Keep produce cold by putting it on ice or refrigerating it during shipping. Spinach and other leafy greens should have ice between layers of leaves to keep it cold. Cold temperatures (below 40 degrees) slows down the growth of microorganisms and prolongs shelf life.

- Make sure the vehicles you are using to transport food items are clean. Vehicles that are used to carry fresh produce should not be used for other purposes that might lead to contamination -- moving animals, chemicals, or compostable materials, and they should be free of foreign substances such as bird droppings. Don't transport produce with raw meat, equipment or gas containers in the same vehicle -- the chance of contaminating your fresh produce is too great.

**Product Handling:** Believe it or not, the simple precaution of washing your hands often is one of the most effective ways to prevent food contamination.

### **Wash your hands:**

- Before handling produce.
- After every visit to the washroom.
- After a break or meal.
- After hand-to-face contact (e.g., coughing, sneezing, blowing nose).
- After handling any materials other than the produce (crates and especially money).

### **How**

- Use proper hand washing techniques.
- Wet hands, lather soap for 20 seconds (sing "Happy Birthday" twice).
- Scrub well (especially fingernails and knuckles) Use finger-nail brushes if available.
- Rinse
- Dry hands and wrists with paper towel.

### **If there is no water?**

- Use hand wipes to remove soil.
- Use hand sanitizer.
- Do not handle or sell any type of food if you have a contagious illness -- especially an intestinal problem. If you have any cuts, sores or wounds, be certain they are bandaged properly. This protects both you and the food products you are handling.
- Wear clean, protective clothing, such as clean or one-use aprons, gloves, smocks and shoes. Soiled clothing can harbor bacteria that can be transferred to produce you're handling.
- Clean and sanitize all utensils and surfaces that will have

contact with food.

**Sale and Display**

• Be sure clean and sanitize all surfaces before setting up your display. Wipe down surfaces regularly thereafter with a clean towel or wipe.

• Never allow animals near your produce, including rodents, birds and domestic pets.

• Pre-pack food items before putting them out for display. This will prevent too many consumers from handling the same produce, and protect the produce from dust, dirt, etc. Mark the date clearly on labels.

• As much as we all like it, money can be pretty dirty! Consider having one person handle the produce, and another taking money and giving change . Or, change gloves after handling money and before handling produce.

• Keep all food items and containers off of the floor or ground. Containers should be put on a pallet or another empty crate to prevent dirt, dust or splashing water from contaminating the produce inside, and to keep rodents or pets from getting into them.

• Separate different types of food, especially high-risk items such as meat from produce.

• Be sure to have an appropriate waste container nearby, so waste products can be safely thrown away. Waste containers should be leak- and pest-proof. Containers such as a crate or open basket could allow leaking and attract pests.

• Educate your customers about food safety and provide hand sanitizer or wipes for them to use before handling any of your produce.

*by Sanja Ilic & Jeff LeJeune, Food Animal Health Research Program and Doug Doohan, Department of Horticulture & Crop Science. VegNet Vol. 14, No. 25. August 14, 2007, Ohio State University Extension Vegetable Crops*

**ORGANIC SEED PARTNERSHIP/MOFGA**  
**VEGETABLE VARIETY SELECTION & SEED**  
**PRODUCTION WORKSHOP**

Tuesday, August 21, 4 pm until dark  
Highmoor Farm, Monmouth, ME

At the University of Maine’s Highmoor research farm:

\* Get hands-on instruction from UMCE veg specialist Mark Hutton & OSP staff in how to select for improved vegetable varieties in plantings of tomatoes, cukes, peppers, and broccoli.

\* Learn seed-saving and seed-cleaning techniques from folks with the OSP’s mobile seed production unit. They’ll demonstrate techniques using both mechanized equipment and tools you can build and use on your farm or in your garden.

\* Bring seed and they will clean it for free! Tour trials of hoop house tomato production, use of living mulches in bed production, and vegetable varieties (including melons, which will be ready for tasting).

Highmoor Farm is located at 52 US Rte 202 near Monmouth, ME. The workshop is free, open to the public, and will include strengthening refreshments. If you are planning to bring seed to clean, please contact Teri Ferrin (315-787-2396, [teri.ferrin@ars.usda.gov](mailto:teri.ferrin@ars.usda.gov)). For more information, contact Mark Hutton (207-933-2100; [mhutton@umext.maine.edu](mailto:mhutton@umext.maine.edu)) or Elizabeth Dyck ([organicseed@nofany.org](mailto:organicseed@nofany.org) , 607-895-6913).

**PEPPER REPORT**

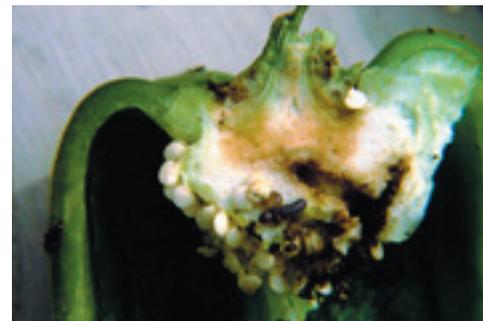
Growers are reporting good size, yields and quality in peppers. It is still important to be alert to European corn borer in areas where that pest is a problem. ECB captures near pepper fields are still high enough to warrant continued sprays. We are still finding egg masses in these fields.

It may be too late to control pepper maggot, but it is not too late to watch for injury in harvested peppers. If fruit is turning red early, that may be a good indicator of insect damage inside. With pepper maggot, look for oviposition stings, tiny neat

round exit holes at the blossom end, or cut a few open to check for feeding damage. If there is feeding under the cap, it is probably ECB since they enter by chewing their way in under the calyx. Pepper maggot is legless, pudgy, all white, with dark ‘mouth hooks’ at the narrow end. ECB is light or blotchy, with a dark head capsule and six prolegs near the head. Both can allow soft



*Pepper maggot fly damage inside pepper. Photo by Jude Boucher.*



*European corn borer damage inside pepper*

rot bacterial to enter the fruit. Neither is welcome among customers. Pepper maggot has been a serious problem in southeastern MA and RI for decades. It typically shows up at very modest levels in the Connecticut Valley. It reached NH for the first time last

summer. Expansion of its range is not a welcome turn of events, but is probably just one of the many shifts we will see in coming decades!

## CORN REPORT

Corn earworm captures are variable around the state. The heaviest counts, as is typical, are along the southeastern coast. Counts were 12 per night, squeezing up close to the threshold for a 3 day spray schedule. Counts are lighter in the Connecticut Valley and many central Mass locations, but variable. Some locations captured 3-12/week, 0.5-1 per night low enough for a five day schedule on silk. However at one farm in Hadley, one in Deerfield and one in Still River, captures ranged from 22 to 37 per week (3 to 5 per night) which calls for a four day schedule. Two locations (Concord, Leicester) reported zero corn earworm moth captures, which means that the ECB flight would dictate a weekly spray on silk. Given variable winds, thunderstorms, and weather fronts going many different directions, it is not surprising to see differences between farms. If you have a pheromone trap, keep it moving into new silk. If you don't have a trap, call a neighbor who has one! While daytime highs have been in the 80's, nights have been cool, often in the low 60's. Temperatures below 80 in the daytime and in low 60's at night extend the time for egg hatch and slow down the moth's egg laying activity at night. If this occurs, spray schedules can be extended for one day.

Scout whorl stage corn for fall armyworm damage. Pressure is lower than last year, especially inland. We have found damage in southeastern Mass and some central Mass locations, but the Connecticut Valley has generally had low numbers so far. Cleaning these infestations up at whorl or pretassel stage is critical to keeping ears clean.

European corn borer flight is declining. Counts are lower this week in all locations. Continue to scout pretassel blocks. We are still finding egg masses in the field, but the number of new egg masses will decline as flight drops. We will be dealing with the caterpillars of this second generation for another several weeks, however.

Storms have been spotty – there may be a downpour in one area, and no rain in the field down the road. Dry conditions may call for irrigation to ensure good tip fill as ears mature. Growers are using bird repellent devices to keep bird damage down. Move scare eyes into the block that's *almost* ready to get there before the birds do.

### CORN EARWORM THRESHOLDS

Moths/Night	Moths/Week	Spray Interval
0 - 0.2	0 - 1.4	no spray
0.2 - 0.5	1.4 - 3.5	6 days
0.5 - 1 day	3.5 - 7	5 days
1.0 - 13.0	7 - 91	4 days
Over 13	Over 91	3 days

### Sweet Corn Trap counts for August 16, 2007

Location	ZI	EII	Total ECB	CEW	FAW
Holyoke	2	2	4	0	-
South Deerfield	2	23	25	-	-
Deerfield	7	28	35	22	7
Whatley	15	24	39	5	3
Hadley (2)	1	3	4	26	-
Hadley (1)	0	8	8	1.5	0
Easthampton	-	-	4	3.5	-
Sunderland	1	40	41	11	1
Rehoboth	17	1	18	85	-
Concord	9	6	15	0	0
Leicester/Spencer	0	1	1	0	0
Northbridge	1	0	1	12	0
Tyngsboro	2	17	19	12	9
Dracut	2	1	3	1	0
Lancaster	10	1	11	3	0
Still River	2	2	4	37	-
Mason, NH	1	1	2	4	-
Hollis, NH	3	0	3	17	-
Litchfield, NH	0	0	0	22	5

### Pepper Trap Counts for August 16, 2007

Location	ZI	EII	Total ECB
Hadley	2	21	23
Amherst	18	0	18
Hatfield	1	137	138

--Thanks to our scouting network: R.Hazzard, P.Westgate, A.Brown, A.Lopez-Swetland, D.Rose, J.Golonka, S.Pepin, G.Hamilton, P.Willard, J.Mussoni

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