UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 20, Number 13 July 30, 2009

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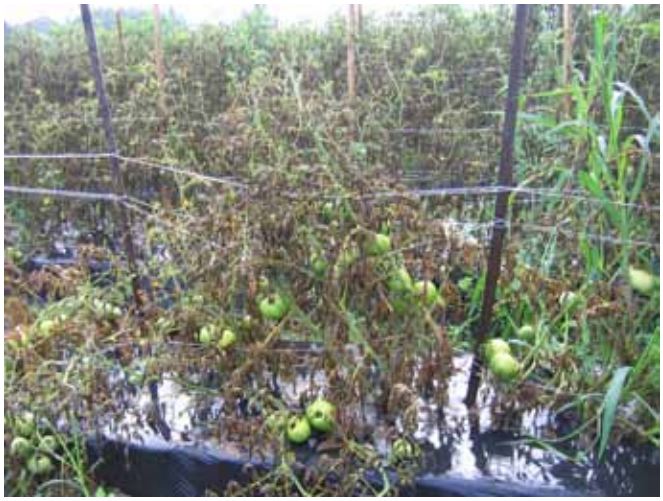
CROP CONDITIONS JULY 30, 2009

Summer arrived this week, and heat-loving plants appreciate it. Cherry tomatoes are ripening. Eggplant and peppers are coming on, at least on plantings that had an early start, most likely with plastic raised beds. Plastic gave a significant boost this season. Poor fruit set and small stature are an issue in pepper plantings that are bare ground or did not get a head start before the June epic of cloudy-cool-wet weeks. Potato digging has begun for fresh market red and white potatoes. Main season sweet corn is in full swing and corn earworm has arrived. Lettuce and other greens have bolted rapidly in the heat but the moisture (still plenty of it falling on a regular basis) makes it easier to get fall crops started. Carrots are growing well. The late blight outbreak took down many tomato and potato crops this week, especially those that had not received an intensive fungicide program (see late blight update). Hopefully, someone will have tomatoes for the tomato contest this year. It's a tough growing season, but the farmers markets and farmstands are full of great local produce, nonetheless.

Phytophthora capsici is showing up in cucurbits, starting in low spots where saturated soils were even more saturated than the rest of the field, and growers are disking in the infected sections in hope of limiting the spread. Powdery mildew and Plectosporium blight are making their annual appearance in vine crops – see articles below. Downy Mildew has been found as far north as Suffolk County in NY, just south of New Haven CT; the forecasted risk to MA fields has been fairly low so far, but that may change soon.

LATE BLIGHT UPDATE: POTATO AND TOMATO

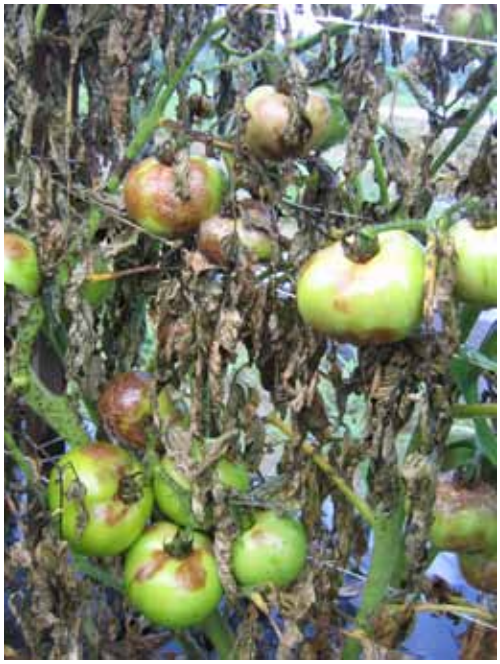


I'm beginning to use the word 'epidemic' to describe what is happening. We are receiving calls and reports about outbreaks from all over the state. Potato and tomato that are being sprayed often (5 days apart, more or less) seem to be holding up against the late blight inoculum that is everywhere in the environment. This is the encouraging news: fungicides are working – so far. This is true for fungicide programs with the best systemics and protectants available, and it also seems to be true for the copper hydroxide products that are available if your farm is certified organic, as well – much to our surprise. Copper is working where growers began spraying several weeks ago, before late blight infected the field. For growers who are trying to save an infected field, it is not clear yet what will, and will not, be effective.

The inoculum is clearly present throughout the state. Fungicides will need to be applied regularly through harvest, for tomatoes, and until tubers are mature and dug green or vine killed, for potatoes. Potato growers are reporting good quality and yield as they begin early harvest.

Crop loss. However, tomato and potato crops that have not been sprayed are dying rapidly. Late blight is living up to its

reputation as a disease that can kill a crop within a few days. Though we've had some hot, sunny and humid days, evening rainstorms and >12 hour leaf wetness periods continue to be very regular events. So the weather conditions are still very favorable for this disease. Of course, early blight and Septoria leaf spot are widespread as well. If your field is holding or not infected yet, begin or continue a regular fungicide program.



After the crop is lost. If your potatoes cannot be saved, mow-kill them. Looking at a field of carefully staked and woven tomatoes covered with green fruit and blackened foliage is very discouraging. I'm learning that late blight has a distinctive smell. I spoke with a grower about how he typically dismantles a field in the fall: grab all the strings right near the stake, cut them all with a knife. Do this at each stake, and pull out the strings from that section between stakes. After a while you have a bundle of twine in your hand, and the plants are now free of twine. Pull stakes and pile on a wagon systematically. Now you can go through with a rotary or flail mower and chop up the vines and fruit. You have done your neighbors a favor by reducing the capacity of your crop to generate millions and millions of spores that can travel on moist winds to their fields. If your tomato field is beyond recovery, do this as soon as possible.

Potato harvest. If your potatoes were mowed or vine killed, can they be left in the ground for the next month, for harvest in September? There is some risk from late blight spores washing into the soil if the vines were infected. However, the ground is probably the best place to store them: moist, moderately cool, dark. These conditions are hard to achieve in a barn in August. As I'm told, 'what's rotten will rot, and what's good will keep in the ground'. The skins will harden during the two weeks or so after vine kill. This will make them less prone to bruising. During harvest, avoid bruises and cuts as much as possible, as they allow entry of pathogens and increase moisture loss. If possible, harvest when conditions are not muddy and wet. After harvest, a curing period when tubers are held at 50-60 degrees F and RH 95% for 10-20 days will cause wounds to heal or 'suberize' and will help prolong good quality in storage. Fans run 1-2 hours per day over the pile can help provide oxygen without excessive drying. Proper curing improves storage time and quality. Potatoes with late blight, soft rot, or Pythium leak will break down rapidly under curing conditions. These should be graded out. Holding temperature for storage is normally around 38-40 degrees F (and 95 % RH) for tablestock potatoes, and it is best to cool tubers slowly down to that temperature.

Greenhouse tomatoes. If you have greenhouse tomatoes near a late-blight infected field, consider using a protectant such as mancozeb (Dithane 45) or copper hydroxide (Kocide DF, Champ WG); check the label to be sure that greenhouse tomatoes are on label. Previcur Flex is also labeled for use in greenhouse tomatoes (can be used twice) with a 2 days to harvest restriction.

COPPER FUNGICIDES FOR ORGANIC FARMS

Late blight is hitting the region very hard, and growers are struggling with difficult decisions. Conventional growers have access to fungicides that can effectively slow or control the disease. Organic growers have more limited options. The only material available to organic growers that has proven effective in preventing late blight is copper. Despite being 'organic' and less toxic than many conventional materials, copper is not without it's dangers. Organic growers who sell primarily to retail or wholesale markets may feel that they have no choice but to do what is necessary to try to save their crop in order to recoup their investment. Organic CSA's have a different set of considerations, and may find themselves on the horns of a dilemma. On the one hand, shareholders may not want anything sprayed on their produce, no matter how benign. On the other hand, shareholders will be very disappointed if there's no tomatoes, which is almost certain to be the result this year if copper isn't applied preventatively on a regular schedule.

For many CSA's the tomato crop has already been lost. For those who still have a crop to save, this article provides some more detailed information about the copper products available to you so you can make more informed decisions. If a potato or tomato crop is showing a small amount of infection with late blight, there is some possibility that a copper

spray program could save it. This will depend on weather conditions, coverage, and how well established the disease has become. Some growers are making this effort to try to save their crop. We do know that without sprays, the disease can destroy the crop in less than a week.

Using Copper

Two copper products that are allowed in certified organic production are registered in Massachusetts: NuCop 50WP and Champ WG. Copper hydroxide is the active ingredient in both.

Copper fungicides are protectants, so they MUST be applied to the foliage before infection. The copper ion is absorbed by the germinating spore, and the copper denatures spore proteins and kills the fungus before it infects the plant. Once infection of the tissue has occurred, copper has no effect on the growth of existing lesions in foliage or stems.

Because there is no 'kick-back' or curative action, coppers must be applied regularly throughout the production season, beginning BEFORE the disease becomes established in the field. In dry conditions, coppers presists on plant surfaces. New growth would not be covered. Thus, when the foliage is growing rapidly or when there is frequent rain, applications are required more frequently in order to protect the foliage. Using an approved adjuvant or 'sticker' may help the product be more rainfast.

Human Health Hazards

Skin and especially eye exposure is the most serious risk associated with using copper hydroxide. The greatest health risk is to the person who mixes and sprays the material. Proper protective equipment should be worn when handling or applying any pesticide or fertilizer. The required protective equipment is specified on the label: long-sleeved shirt and long pants, chemical resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride, shoes plus socks and protective eyewear. You may also want to consider wearing a respirator or at least a dust mask, especially for mixing. In addition, the product generally comes in a paper bag that has a tendency to leak out the seams. It would be wise to put the container in a double plastic bag. The same set of precautions that apply to conventional pesticides should be observed when applying copper.

This also means that workers or pickers who are in the field after spraying could be exposed to treated foliage or fruit. There is a 24 hour days to harvest restriction, which means no fruit can be harvested for 24 hours after a spray. Even after that waiting period, pickers should wear gloves and long sleeves. Tomatoes should be washed before marketing.

The pick-your-own cherry tomato patch that is a favorite with CSA members may not be possible this year. If unsprayed, it will die. If sprayed, it would be best to have workers pick and wash the fruit before selling. Avoid the family trip to the cherry tomato patch, and avoid having children pop the yummy fruit into their mouths. Oral toxicity of copper is not high (it is lower than aspirin or caffeine) but ingestion still should be avoided.

Environmental Hazards

Some farmers have expressed concern about copper toxicity in the soil or with respect to soil microbes. Copper is actually a plant micronutrient; that is, it is an essential plant nutrient at low levels. The amount found naturally in soils in MA ranges from 0.1 to 8 ppm. The desirable level for agriculture would depend on the crop to be grown and other soil factors such as pH. Copper does not degrade in soil or leach into groundwater, but becomes chemically bound up, especially with organic matter. An application of 1 lb of active ingredient per acre would raise the copper levels about 0.5 ppm. A single application of Nu Cop at 2 lb per acre with 77% AI adds about 1.5 lb copper per acre to the soil, or could raise the concentration in the soil by 0.5-0.75 ppm. Depending on the level in your soil, it would take numerous applications to exceed the levels that are in the normal range.

The cumulative effect of copper applications might be more of a concern in perennial planting systems. In annual rotational systems, where copper applications might only made every 4-6 years, copper accumulation is less of a concern. You probably do more damage to the balance of micro flora and fauna in the soil by plowing your fields than you will by applying copper when you need it. Nonetheless, copper use is regulated and certified organic farmers in the US are required to restrict their use of copper products. Regular soil tests should be taken and copper levels in the soil should be monitored. In addition, copper can be very toxic to fish and aquatic organisms, so care should be taken to apply sprays properly and avoid drift and run off.

Copper can be an excellent tool in times like these, when there is really no other way to save a crop. It can be dangerous and is not a tool to be taken lightly, but when applied carefully and correctly it has minimal danger to the applicator or the environment. Copper will not save an infected field, but for plantings that are not yet infected it may make the difference between acceptable yields and no crop at all.

--R. Hazzard, A. Cavanagh. Sources: Brady, Nature and Property of Soils; A. Barker, Dept PSIS, UMass.

POWDERY MILDEW OF CUCURBITS: 2009 UPDATE

Powdery mildew is a major production problem in cucurbit crops in all parts of the world. All cucurbits are susceptible, but the disease is less common on cucumber and melon due to the prevalence of resistant cultivars. Yields are reduced by a reduction in the number and/or size of fruit. Fruit quality can also be adversely affected by sunscald (due to defoliation), incomplete ripening, reduced storability (winter squash), and poor rind quality or discolored handles (pumpkins). In addition, infection by Powdery mildew may predispose plants to other diseases (Gummy stem blight).

Symptoms occur on leaf surfaces, stems, and petioles as white, powdery fungal growth. Symptoms develop first on older leaves, shaded lower leaves, lower leaf surfaces, and on older, fruit bearing plants. Infected leaves shrivel and die; plants may senesce prematurely. The pathogens are obligate parasites and cannot survive in the absence of living hosts; initial inoculum for the Northeast is most likely airborne conidia originating in southern states. Other possible sources include greenhouse grown cucumbers and alternate hosts. Under favorable conditions, Powdery mildew develops rapidly; the time between infection and symptom expression can be as short as 3 days and many spores are produced. Conditions favoring infection include a dense plant canopy, low intensity light, high nitrogen fertilization, and high relative humidity (although infection can occur at relative humidity of less than 50%). Optimum temperatures for disease development are 68-80˚ F; infection can occur between 50-90˚ F. Temperatures of 100˚ F or above stop Powdery mildew development.

Plant resistant varieties where available; resistant varieties of squash and pumpkin are under development. Separate successive cucurbit plantings physically to prevent older plants from serving as an inoculum source for main crop. Scout fields regularly (particularly lower leaf surfaces) and apply fungicides early in disease development. Powdery mildew cannot be effectively controlled by fungicide applications after the disease is established. Powdery mildew develops best on the lower leaf surfaces; thus a successful fungicide program requires controlling the pathogen on both leaf surfaces.

An important component of fungicide programs are materials which can move to the lower surface (systemic or translaminar). Systemic fungicides, due to their single site mode of action, are prone to resistance development and the powdery mildew fungi have demonstrated the ability to develop resistance to this type of fungicide: (benzimidazoles (Topsin M) and strobilurins (Flint, Cabrio, Amistar) are largely useless now due to resistance. All strobilurin fungicides, including Pristine, a combination product, have been removed from recommendations due to widespread resistance in pathogen populations. FRAC Group 3 fungicides (Demethylation inhibitors like Procure) are only effective at highest labeled rate due to the emergence of resistance to these materials. Managing resistance is an important consideration when selecting a fungicide program. Current recommendations for managing resistance consist of an alteration of effective high-risk materials of two or more chemical classes at 7 day intervals, with a protectant fungicide included in every application. Systemic materials should only be applied once per season, and always mixed with a protectant. A protectant fungicide has multi-site activity, low resistance risk, and will control strains resistant to the systemic chemical.

At this point, we are recommending application of a protectant fungicide alone until powdery mildew is first seen in the field. At the first sign of powdery mildew in the field, immediately apply myclobutanil (Rally, Group 3) at the highest labeled rate mixed with a protectant such as chlorothalonil (Bravo). Use the one of the following in an alternating program: Quintec plus a protectant (quinoxyfen, Group 13), Procure plus a protectant (triflumizole, Group 3, highest labeled rate), sulfur (Microthiol, Kumulus, MicroSulf, Group M2), potassium bicarbonate (Armicarb, Kaligreen, Group M) neem oil (Triology, Group M) or mineral oil (JMS Stylet Oil, Group M). All Group M fungicides have protectant activity, make good tank mixing partners, and have low risk of resistance development. See the NE Vegetable Management guide for more recommendations (available online at www.nevegetable.org).

- M.B. Dicklow, References:Zitter, Thomas. 2009. Cucurbit Fungicides (Labeled & Rates/A) as of June 2009. www.vegetablemdonline.ppath.cornell.edu/NewsArticles/Cuc_LabeledRts

LATE-SUMMER LEGUME COVER CROPS FOR OVERWINTERING: RED CLOVER AND HAIRY VETCH

Late summer is one of the best opportunities vegetable growers have to establish a legume cover crop to supply the following year's nitrogen needs. Late summer provides time for the legume to establish in the fall. Enough fall growth is needed for the plants to develop a strong root system and enough shoot growth to provide valuable winter cover. Most of the nitrogen is fixed during growth in May.

There are two legume cover crops that are both reliable and economical: medium red clover and hairy vetch. Red clover is normally spring seeded, but the easy availability, low seeding rate and high nitrogen fixation make it an attractive choice in the late summer as well.

Legume winter cover crops provide a great deal of nitrogen. If well managed, they can provide as much nitrogen to the next crop as fertilizer containing 100 to 150 lb/ac of nitrogen. Whether you are committed to raising all your nitrogen on the farm, or concerned about paying today's high prices for nitrogen fertilizer, that nitrogen contribution looks attractive.

Choosing the legume

Hairy vetch is the best known winter legume for vegetable rotations in the mid-Atlantic region. It is near its northern limit here, but generally does very well. Medium red clover can be more versatile than hairy vetch, and more economical.

The decision of which legume to use is based on more subtle criteria.

If timing demands that the legume be overseeded into a vegetable crop at the time of the last cultivation, the choice must be red clover. It has the ability to establish in shade after broadcasting on the soil surface. Vetch seed needs to be drilled for reliable fall growth, and therefore best follows harvest and incorporation of the vegetable crop.

If the soil is dry, clover will have a better chance of establishing because it needs less moisture than the large-seeded hairy vetch.

If you raise small grain on the field, clover must be the choice. Hairy vetch has hard seed that will germinate in future small grain fields, and produce vetch seed that contaminate the grain.

If soil compaction is a problem, clover is preferred. Neither cover crop does well on compacted soil, but hairy vetch is more sensitive to the resulting waterlogging.

Nurse crop

Both of these legumes benefit from a nurse crop. Hairy vetch requires a nurse crop to survive reliably overwinter, and it is valuable for medium red clover as well. The nurse crop helps keep down weeds during their slow establishment, reduces winter kill and provides physical support that reduces matting under the snow and during spring growth.

A small-grain nurse crop should be sown at a low rate (approx 40 lb/ac). Wheat overwinters to provide support in the spring, especially for hairy vetch. It is likely the best choice for most situations. Oats die during the winter, allowing faster breakdown for earlier vegetable planting. Rye is the classic nurse crop with vetch, but it can be to be too vigorous in some cases.

Sowing

The cost of seed is $45-$56 per acre for clover (15 lb/ac at ~$3.00 - $4.00/lb) and $120 - $160 for hairy vetch (40 lb at ~$3.00 - $4.00/lb). Inoculum to insure nitrogen fixation is innexpensive. The grain seed adds $7 to $15 per acre. Clover and small grain seed of adequate quality for cover cropping can often be bought at a significantly lower cost from local farmers.

Hairy vetch is sown at 40 lb per acre. Vetch rates as low as 25 lb per acre work, but the additional weed suppression and nitrogen fixation from the higher rate make it attractive for vegetable growers. The small grain can be seeded at 40 lb/ac. If the grain seeding rate is too low, winterkill will be excessive. If it is too high competition will reduce vetch growth and nitrogen fixation. The vetch and grain seed can be mixed together in the drill.

Medium red clover is sown at 15 lb per acre. The seed can be broadcast onto prepared ground, or sown with a grass seeder. If overseeded into a standing crop by broadcasting, it is worth using 20 to 25 lb/ac. There are other red clovers available, but they don't work nearly as well for this application.

The sowing time is mid-August through early September. Later seeding results in inadequate growth. Even within this window, earlier sowing improves winter survival, nitrogen fixation and weed control. The main cause of poor establishment of either crop is lack of moisture. We usually receives adequate rain in late August and September for these crops to establish.

Spring management

In the spring, both crops are incorporated at early bloom (typically late May). Plan a rotation where vegetables are sown or transplanted in mid-June. This timing of incorporation maximizes nitrogen fixation, and minimizes both regrowth and volunteer seed. Bloom time is determined mostly by spring temperature, so the date will vary. Most of the nitrogen is fixed during the month of May, so premature incorporation costs a lot of nitrogen. In fact, if the field needs to go to vegetables in May it is not worthwhile to do a fall-seeded legume because so little nitrogen will be fixed. It would be more effective nitrogen management to have a vigorous overwintering cover crop that scavenges leftover nitrogen.

-T. Bjorkman, Cornell Cooperative Extension. Adapted for Massachusetts by Andy Cavanagh. See www. http://www.nysaes.cornell.edu/hort/faculty/bjorkman/covercrops/decisiontool.php or search for Cornell Cover Crops Decision Tool for an excellent online resource about cover crops for vegetable growers.

PLECTOSPORIUM BLIGHT OF CUCURBITS

Plectoporium blight (Microdochium blight) caused by *Plectosporium tabacinum* (*Microdochium tabacinum*) was first observed in Tennessee in 1988 and has since been reported throughout pumpkin growing regions of the United States. The most susceptible cucurbits to Plectosporium blight are pumpkin, yellow squash, and zucchini.

Plectosporium tabacinum is a common fungus in the soil and on decaying plant material and is favored by warm, wet weather. The spores are spread by rain-splash and wind. Plectosporium blight is known to cause damage to a variety of cucurbit crops in Europe and Asia, but the strain present in the U.S. seems to primarily damage pumpkins, summer squash, zucchini and a few varieties of gourds. More recently it has shown up on *Cucurbita moschata* (butternut family) and *Cucurbita maxima* (hubbards, buttercup, giant pumpkins, etc), so it is possible that the US strains are jumping species and will become a threat to previously immune crops. In wet years, which favor disease development and spread, crop losses in no-spray and low-spray fields can range from 50 to 100%. Fortunately, this disease is easily recognized and can be effectively managed.

Description and Management

Plectosporium blight is favored by cool, rainy weather. The fungus can overwinter on crop residue and can persist in the soil for several years. Plectosporium has not been reported to be seed-borne. Tiny spores are formed in lesions on vines, stems, fruit, leaves and leaf petioles. Spores can be dispersed by wind over long distances. Lesions are small (<1/4 inch) and white. On vines, petioles and leaf veins, the lesions tend to be diamond to lens-shaped; on fruit and leaves lesions are usually round. The lesions increase in number and coalesce until most of the vines and leaf petioles turn white and the foliage dies. Severely infected vines become brittle and will shatter if stepped on. Early in the infection cycle, foliage tends to collapse in a circular pattern before damage becomes more universal throughout the field. These circular patterns can be easily detected when viewing an infected field from a distance. Numerous fruit lesions produce a white russeting on the surface and stems that render the fruit unmarketable. To scout for Plectosporium early in the season, part the leaves of the canopy and look at the main large vine of the plant that runs along the ground...that is where Plectosporium tends to show up first.

Important Things To Remember:

- When Plectosporium blight occurs, rotate away from summer squash and pumpkins for two years.
- Choose sunny, well drained sites for cucurbit production.
- No resistant cultivars of pumpkins have been reported.
- Scout for disease early and apply protectant fungicides when the disease first occurs. The disease is readily controlled

by fungicide applications. Thorough coverage of foliage, vines, and fruit is necessary for good control.

Chemical Controls

Chlorothalonil (i.e. Bravo) and strobilurin fungicides (Pristine, Cabrio, Flint, Amistar = Quadris) are the most effective at controlling Plectosporium blight. The following materials are available for controlling plectosporium in cucurbit crops.

- azoxystrobin (Quadris): 11.0 to 15.4 fl oz/A (o dh, REI 4 h). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Cabrio.
- chlorothalonil (Bravo): 1.8 to 2.7 lb/A (0 dh, REI 12 h). Apply when conditions are favorable for disease development. Repeat no sooner than a 7 day interval. Do not apply more than 19.1 lb/A per growing season.
- maneb/ mancozeb (Maneb, Penncozeb, Manzate Dithane): Rates vary depending on formulation. See label. (5 dh, REI 24 h).
- pyraclostobin (Cabrio EG 20 %): 12 to 16 oz/A (0 dh, REI 12 h). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Quadris.

Where trade names or commercial products are used, no company or product endorsement is implied or intended. Always read the label before using any pesticide. The label is the legal document for product use. Disregard any information in this newsletter if it is in conflict with the label.

-T. Jude Boucher, University of Connecticut, Cooperative Extension System, M. Bess Dicklow, UMass Extensio

SWEET CORN REPORT

Main season corn harvest is going well, and quality is generally excellent though some growers note that ears are still smaller than usual. Demand is high. Overall, corn is growing really well now. Corn earworm pressure is rising statewide, as storm fronts reach the state from points south and west. There seems an upswing of fresh moths just in the past two nights. European corn borer flight has increased also as the second generation of adult moths emerges. Silking corn needs to be sprayed at 4-5 day intervals depending on counts. Aim for good coverage of the ear zone. Move CEW traps into fresh silk on a weekly basis and check every 2-3 days to get the best measure of changes in CEW flight – it seems to be changing rapidly. Scout whorl-stage corn for fall armyworm, and pretassel corn for ECB and FAW. For growers using Trichogramma, the second release is being made this week.

Pepper Trap Counts

Location	Z1	EII	Total ECB
CT Valley			
Sunderland (1)	6	0	6
Deerfield	0	0	0

Sweet Corn Trap Counts

Location	Z1	EII	Total	AVG	FAW
CT Valley					
South Deerfield	0	0	0	0	0
Deerfield	2	0	2	1.5	0
Sunderland (1)	-	-	-	9	0
Sunderland (2)	0	0	0	2	0
Hadley (1)	0	6	6	12	0
Hadley (2)	0	3	3	2.5	0
Granby	0	0	0	0	0
Central & Eastern MA					
Lancaster	0	0	0	5	0
Tyngsboro	0	1	1	12	0
Concord	0	0	0	14	0
Northbridge	0	0	0	20	0
Spencer	1	0	1	14	0
Dracut	1	0	1	3	0
Rehobeth	0	2	2	24	0
Nantucket	0	0	0	67	0
NH					
Litchfield, NH	1	0	1	50	1
Hollis, NH	0	0	0	25	0

UPCOMING MEETINGS

Massachusetts Tomato Contest

Date: Monday, August 17th

Place: Boston's City Hall Plaza Farmers' Market

Program Details: http://www.mass.gov/agr/markets/tomato_contest.htm.

The 25th Annual Massachusetts Tomato Contest will be held at Boston's City Hall Plaza Farmers' Market on Monday, August 17th in conjunction with the City Hall Plaza Farmers' Market and the start of Massachusetts Farmers' Market Week. 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 City Hall Plaza Farmers' Market by 10:15 am on August 17th or drop their entries off with the corresponding registration form to one of several locations around the state on August 15th or 16th. These tomatoes will be brought into Boston on Monday. The 25th Annual Tomato Contest is sponsored by the New England Vegetable and Berry Growers Association and Massachusetts Department of Agricultural Resources in cooperation with the Federation of Massachusetts Farmers' Markets.

Twilight Meeting

Redesigning a Garden Center and Farm Stand for Future Growth

Date: September 2, 2009

Place: Volante Farms, Inc., 226 Brookside Rd., Needham, MA

Time: 4:30 PM to 7:00 PM

Program details: www.umass.edu/umext/floriculture/upcoming_events/index.html

Volante Farms, farmstand and garden center recently redesigned and constructed their garden center featuring a new, state-of-the-art 16,000 square foot gutter-connected greenhouse with rainwater collection, ebb and flood benches, heated floor, shade curtains and more. Join us for pizza and an evening learning about their renovation.

For more information, contact: Tina Smith 413-545-5306 – tsmith@umext.umass.edu, Paul Lopes 508-295-2212 ext. 24 – lopes@umext.umass.edu or Bob Luczai 781-275-4811 - bluczai@ballseed.com

Biological Control for Ornamentals in Greenhouses - Putting It All Together

Date: September 17, 2009

Place: Tolland County Extension Center, Vernon, Connecticut

Time: 9:30 AM – 3:30 PM

Program details: www.umass.edu/umext/floriculture/upcoming_events/index.html

UMass Extension and UConn Extension have teamed up for this program with funding provided by a grant from Northeast SARE. Featuring speakers Suzanne Wainwright-Evans, Buglady Consulting, Ron Valentin, Biobest and Carol Glenister, IPM Laboratories for a full day of what works and what doesn't when using biological control in greenhouses. Four and a half pesticide credits toward recertification have been requested. Sponsored by University of Massachusetts Extension University of Connecticut, and Northeast SARE.For more information, contact: Tina Smith 413-545-5306 – tsmith@umext.umass.edu

If you would like to become a Vegetable notes sponsor, please contact Jessica Dizek at jdizek@outreach.umass.edu or 413 545 1445

Vegetable Notes. Ruth Hazzard, editor and Amanda Brown and Andrew Cavanagh, assistant editors. Vegetable Notes is published weekly from May to September and at intervals during the off-season, and includes contributions from the faculty and staff of the UMass Extension Vegetable Program, other universities and USDA agencies, growers, and private IPM consultants. Authors of articles are noted; author and photographer is R. Hazzard if none is cited.