



UMASS
EXTENSION



Vegetable Notes

For Vegetable Farmers in Massachusetts

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CROP CONDITIONS

Harvest of peppers, tomatoes and eggplants is picking up. The list of summer crops being harvested is just about complete – even early melons are ripening. Potato harvest has begun. Vine crops are filling in, and pumpkin and winter squash fruit is setting and sizing up. Sweet corn is excellent, and the last corn plantings are up. Fall vegetables are being seeded or transplanted out. In general, vegetables continue to grow and produce well.

Massachusetts has been fortunate to be spared the extremes of rainy, cool weather that are typical this season in states to the west and north of us. As of Monday July 26, most areas of the state had received 3.5 to 4.5 inches of rain in the past four weeks, except for the Southeast when has logged between 1 and 2 inches. The week brought more rain throughout the state. In general this is a good thing, except that it increases the concern about *Phytophthora capsicii* blight if fields do not drain well. However, irrigation leaks can be just as troublesome (see article below). **Late blight** (*Phytophthora infestans*) is being reported in tomato and potato in Pennsylvania, western and central New York, and northern Maine. This raises some concern about whether it will show up in Massachusetts (see article).

Leafhoppers are causing problems in a number of crops – beans, potato, lettuce, eggplant. It appeared that the

variety Orient Express may be more susceptible as leaf scorch was more noticeable in this variety. We are also seeing high numbers of tarnished plant bugs. These are especially serious where crop fields are surrounded by meadows –ie mixed weeds and flowers that are favorite habitat for both these pests. An excellent brochure on TPB can be obtained at 802 656-5434 (Univ. of Vt Estension). Organic growers should find that pyrethrin (Pyganic) give some control. Nonheating row cover is another option for succession crops.

Emergence of the ‘summer’ generation of many beetles – eg striped cucumber beetle, flea beetle, Colorado potato beetle and moths –eg, European corn borer – is beginning or will begin within the next week or two.

-R Hazzard; sources include New England Weekly Crop Weather 24:14, July 26, NASS

PHYTOPHTHORA ALERT

Many growers are growing susceptible crops – cucurbits, peppers, tomato – in fields that they know are infected with *Phytophthora capsicii*. This is a risky situation but sometimes unavoidable given the crop mix being grown on the farm, and the expanding number of infected fields. With soaking rains that have occurred in many parts of the state, and irrigation being used in many places, growers



Leafhopper nymph on eggplant



Phytophthora: stem and crown rot of pumpkin

need to be vigilant to prevent outbreaks. This can be done, but it takes careful attention. The key is to make sure that standing water is not allowed to sit for as long as 24 hours. Zoospores are released in water and can swim for several



Phytophthora: fruit rot. Note white 'cheesy' coating, which contains sporangia that can spread by wind or water.

hours, finding and infecting plant roots. Leaks in irrigation systems, or poor drainage around raised beds or in low areas of the field could cause an infection to start in the crown, stems or fruit lying on the ground. Infected tissue produces sporangia (spore cases, which contain the swimming zoospores), which can be further dispersed by rain, wind, people or machinery. Once an infection starts, it is very difficult to stop it.

Phytophthora has shown up in the past two weeks, in several fields of pumpkins. In one case, it started as a small patch and expanded rapidly, killing plants as it marched



Phytophthora 'hot spot' spreading down the rows

through the field (see photo). The grower realized afterward that an irrigation pipe used for irrigating the neighboring block of strawberries had a leak, which caused pooling of water in one spot...the spot where the Phytophthora started. Growers have also found infections from irrigation water itself, but in this case the field was already infected from previous years. However, if you think

your pond may be infected, contact the disease diagnostic lab regarding water testing.

We are seeing crown rot, stem rot and fruit rot (see photos). Wilting leaves are often visible when you look out over the canopy. If one plant is infected, remove it and neighboring plants. If one section of the field or one block is infected, we recommend destroying the crop with deep tillage to reduce spread of spores to other blocks. Be sure to power-wash your equipment afterward, to prevent spread of spores on the disks or tires into other fields.

While fungicides cannot replace careful water management, use of fungicides that have activity against this pathogen may reduce the spread or incidence of the disease. Fosetyl AL (Alliette WDG) is registered for Phytophthora blight in cucurbits. Apply when conditions for disease are favorable. Use the high rate when Phytophthora blight is active. Reap-



Plectosporium on pumpkin

ply every 7 to 14 days. Ridomil Gold EC (mefenoxam) is labeled for use in pepper, either as a banded spray or application through trickle. See New England Vegetable Management Guide for details.

-R.Hazzard

PLECTOSPORIUM UPDATE

This week Plectosporium was found in cucurbits on a farm in Amherst. This is a fairly new disease in Massachusetts that occurred on several farms around the state last year. It is also potentially a serious disease, especially on summer squash, zucchini and pumpkin; it may also occur on cucumber. It would be helpful for growers and for the Disease Diagnostic Lab if we could track its emergence and spread. If you think you have Plectosporium in any of your fields (refer to the July 8 newsletter for a detailed description and management plan; also see photo) please contact Dr. Rob Wick or Stephanie Slinski at 545-1045 or 545-1667. If you

are unsure of whether or not what you have is really plecosporium, you can bring or mail a sample to the UMass Disease Diagnostics Lab in Fernald Hall at the Amherst campus. Send samples to:

Dr. Rob Wick, Room 109 Fernald Hall, UMass, Amherst MA, 01003

-R. Hazzard and A. Cavanagh

SOME THOUGHTS ON CROP INJURY

Over the past couple of weeks I have dealt with crop injury observations or phone calls and wanted to make a few comments. The crop injury I have dealt with is primarily contact in nature, causing leaf burning, and happening easily within 24 hours of applications. There are 3 main factors influencing this injury: tank mixing, surfactants, and temperature/humidity.

Tank mixing is often allowed on pesticide labels. Sometimes there are precautions listed. For example, labels preclude mixing some materials such as Sandea or Quadris with emulsifiable concentrates, organophosphate insecticides, or certain surfactants. The reason for this is that one chemical may affect the penetration of another into the leaf causing injury. Another example is with the insecticide Sevin. There have been cases where both the dry and liquid formulations have caused leaf burn. I have seen it when Sevin was mixed with a surfactant and also when it was mixed with a herbicide (Sandea in the most recent case). High temperature and humidity also enhance this potential injury. If a label does not list a certain tank mix that you want to use AND, at the same time, does not preclude it, you may make the tank mix. Remember, however, that you should try it on a small scale first to make sure that there will be no problems.

Surfactants can increase the potential for crop injury by enhancing penetration of pesticides into the foliage or by just causing some burning on their own. Non-ionic surfactants are usually best for improving mixing of pesticides, for enhancing coverage of leaf surfaces, and to improve retention of the pesticide on the crop or weed. It is best to stay away from silicone-based surfactants, ionic surfactants, or others that you are not familiar with unless you have a specific purpose for using them. One that has often caused crop injury is LI 700. This product, although a non-ionic surfactant, was designed to use with glyphosate (Roundup) to increase penetration into weeds and to reduce the pH of the spray mix. When used as a general surfactant and under the right conditions (warm to hot, humid, very sunny), it can cause leaf burn.

Higher temperatures and humidity also increase the po-

tential for crop injury. A good rule of thumb is to avoid spraying in the mornings or middle of days where you can add the temperature and humidity together and get 150 or more. We have seen injury with Poast and Fusilade plus their recommended surfactants or crop oils under these conditions. One interesting point is that, you can still get leaf burning with lower temperatures and humidity, just by increasing the rate of the surfactant.

The take home message is to avoid hot and humid weather, follow label directions, use surfactants only when the label calls for them, use the right surfactant, follow tank mixing directions, test new tank mixes first, and cross your fingers.

*-Rich Bonanno, UMass Extension
Weed Management Specialist*

BE ALERT FOR BLIGHT IN TOMATO AND POTATO

Late blight outbreaks are being reported in many fields- in tomato and potato in western NY, Pennsylvania, and also in northern Maine. While the weather conditions in Massachusetts have not been as wet and cool as those areas, our crops are still at risk. Growers should be scouting their crops frequently and using regular weekly applications of protectant and/or systemic fungicides.

Scouting and symptoms: Scout both stems and leaves of potatoes and tomatoes (both new growth and the lower leaves) as the disease could be in one crop and not the others. Some strains are more virulent in potato than tomato; others may be just the opposite. Scout carefully areas not reached well by sprays, fields with a stretched spray schedule and fields/areas that remain wet longest with dew or after rain.

Look for leaf lesions first as water-soaked spots which enlarge rapidly into pale green to brown lesions and cover large areas of the leaf. Infected foliage becomes brown, shrivels and soon dies. Petioles and stems are affected in a similar manner. Tomato fruit develops a firm, olive to mahogany lesion, usually at the stem end. Soon the entire fruit turns brown. In the early morning while dew is still on the plants late blight lesions appear irregular and black with a fine white fuzz of sporulation. In the middle of a dry day lesions will appear brown with a distinct light green border.

High relative humidity and long periods of leaf wetness (from rainfall, dew, fog, or irrigation) are favorable for late blight. The favorable temperature range is very wide, but the disease proceeds most quickly when average (day and night) temperatures are 59-80 degrees F.

The new *Vegetable Management Guide Photo ID Supplement* has photos of late blight in both tomato and potato. Excellent photos can also be found online at

<http://www.nysipm.cornell.edu/publications/blight/>

If you suspect you have late blight please contact the Disease Diagnostic Lab at 413-545-1045. Identification is key, and it is also important to alert other growers to use tighter spray schedules and more systemic or curative products.

Fungicides: Protectant fungicides applied on a regular schedule are a key way to prevent this devastating disease. Protectant materials must be on the foliage before spores land on leaves that are wet from rain, irrigation, fog, or dew. Therefore, continuous fungicide coverage is necessary to protect plants from infection. Tomatoes and potatoes are susceptible to late blight at any time during the growing season. Choose a fungicide that has maneb, mancozeb, chlorothalonil, or fixed copper as an active ingredient and has tomato and potato late blight on the label.

When conditions are especially favorable for late blight, or if late blight has been reported in your area, products that have preventative, curative and locally systemic activity should be used and a tighter spray schedule (5 days) is recommended. In potato, these include Previur Flex and Curzate These should be mixed with a preventavie fungicide (above) for control of early blight. See the *2004-2005 New England Vegetable Management Guide* for details. Follow label directions to prevent fungicide resistance from developing and to adjust rates according to disease conditions.

Quadris (azoxystrobin) and Cabrio (pyraclostrobin) are registered for use on tomato. These will provide control of late blight if used preventatively or at first sign of disease. They also give excellent control of early blight. However, they should not be relied on throughout the season, to avoid resistance development. Mefanoxam (Ridomil Gold MZ or Ridomil Bravo) may also be used; however, it is likely that any late blight that occurs will be the mefanoxam-resistant type.

For organic growers, the copper fungicide Champion WP is OMRI listed and is the best material available to organic growers in both potato and tomato. It will provide fair control of late blight and early blight, again if used preventatively. Using Nufilm-17 as a sticker-spreader with the Champion is recommended. While many organic growers prefer to avoid all fungicide sprays in these crops, protective sprays will prevent serious losses to both early and late blight. Unsprayed tomatoes or potatoes are often the first site of late blight outbreaks in a region.

Sanitation: Infected fields should be plowed under or flamed to prevent further spread throughout the region. In the long run, the best management practice is sanitation. Late blight overwinters only on living tissue of these crops and since tomato tissue does not survive the winter in New

England the only real source of overwintering inoculant is from potato tubers. Harvest all potatoes, destroy culls, look for volunteers in the spring and destroy.

Application methods: The key word here is coverage. Thick canopies, stem infections, and lower canopy infections, all translate into the need to deliver fungicides in the most effective manner. Slowing the tractor speed, adjusting boom height to the appropriate level over the plant canopy, and entering the field from a different direction each time you spray may provide better coverage. Air-assist sprayers have been shown to be superior in product delivery, but not every grower has this equipment.

-R. Hazzard, thanks for resource material from B. Caldwell, E Sideman, T. Zitter, R. Wick., A. Seaman.

SWEET CORN AND PEPPER

Fall armyworm moths were captured in high numbers in pheromone traps this week, after the storm moved through. This means that armyworms will likely show up in whorl-stage corn or pretassel corn. Scout for damage and caterpillars and use the 15% threshold. We are starting to see the second European corn borer flight pick up. Numbers in Whately Feeding Hills and Hadley in the Connecticut Valley were 10-28 moths per week, in traps checked Wednesday or Thursday. For pepper growers, first sprays are recommended one week after weekly catch exceeds 7 moths per week. That means some growers should begin a spray schedule next week. Where ECB flight has not yet exceeded 7 moths per week, growers can wait another week to begin sprays.

Currently, pretassel corn is clean. First generation borers are in the pupal stage. Sweet corn growers can expect some new European corn borer feeding activity in new emerging tassels to begin again in about two weeks, after the new flight begins and new eggs hatch. At that point, we may also be seeing FAW in tassels.

Corn earworm is variable. Berkshire and Vermont sites are 0-3 moths per week. Connecticut Valley is at 3-6 moths. Southeastern and Central Mass ranges from 8 to 64 with highest numbers near the coast. See below for the spray schedules associated with these numbers. Remember, the most reliable and timely way to know how to time your spray schedules is with your own traps in your own freshly silking corn. These numbers will confirm what you find on your own farm.

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 days	3.5 - 7	5 days
1.0 - 13.0	7 - 91	4 days
Over 13	Over 91	3 days

SWEET CORN TRAP COUNTS 7/23- 7/28

Town	Date	ECB Z1	ECB E2	Total ECB	CEW	FAW	%PT
Berkshires/ Champlain Valley							
Brandon, VT	7-26	0	0	0	0	0	0
Sheffield	7-27	0	2	2	3	0	0
Westminster, VT	7-28	0	2	2	0	0	0
Pittsfield	7-27	0	0	0	1	0	0
CT River Valley							
S. Deerfield	7-28	0	0	0	0	0	0
N. Hadley	7-28	0	10	10	11	6	0
Hatfield	7-28	13	15	28	3	0	0
Hadley	7-28	4	0	4	0	0	0
Feeding Hills	7-27	12	1	13	5	8	0
C.&E. MA							
Dracut	7-27	2	2	4	3	0	0
Dighton	7-26	1	0	1	27	2	0
Still River	7-28	1	0	1	26	0	0
N. Andover	7-23	0	0	0	36	10	0
Concord	7-26	0	0	0	26	0	0
Ipswich	7-24	0	0	0	64	30	0
Leicester/ Spencer	7-28	2	0	2	8	32	0
Northbridge	7-28	1	0	1	11	32	0
Tyngsboro	7-26	0	2	2	8	32	0
Seekonk	7-27	0	2	2	40	0	0
Sharon	7-27	0	3	3	21	0	0

-J. Mussoni, D. Rose, D. Dumaresq, J. Golonka, P. Willard, B. Howden, W. Kingsley, A. Duphily, P. Westgate, T. Harlow, S. Peabody, and R. Hazzard

CORN EARWORM CONTROL IN ORGANIC SWEETCORN

Now that corn earworm has been found throughout the state it is time to take control measures. While sprays of Bt or Entrust will be effective for control of European corn borer in the tassel, additional measures are needed for control of corn earworm. Direct silk application of vegetable

oil mixed with Bt reduces corn earworm and corn borer damage to ears by coating the silk channel and carrying the Bt down to the silk and kernels in the tip where CEW (and also some ECB) larvae feed. This method is designed for use by certified organic growers, although growers must be careful to select approved materials.

An oil applicator (the Zealator™) designed to make this hand-application method economical and comfortable, is available from Johnny's Selected Seeds (207-437-4395).

The UMass Extension Vegetable program has just published an eight-page fact sheet, **Organic Insect Management in Sweet Corn: Scouting, Thresholds and Management Methods for Key Caterpillar Pests in Sweet Corn**, describing the pests, monitoring methods, materials, tools, timing, and how to integrate oil applications with other methods. Contact the Extension Bookstore (413-545-2717) or the Vegetable Program office to obtain a copy (413-545-3696).

Here is a brief summary of some key points:

Timing: Corn should be treated with 0.5ml of corn oil and Bt, once during early silk stage. Action should be taken when >2 corn earworm moths are found per week in a trap in your area. The best time to apply oil is generally 5-7 days after silk growth starts, or 3-4 days after silk is full grown. At this time, the tips of the silks have begun to wilt and turn brown and pollination is nearly complete. Applications made earlier than 5 days after silk do not give better control, but may result in a higher rate of "cone" tips. This occurs when oil interferes with silk pollination resulting in unfilled kernels in the last half-inch of the tip. While partially filled tips are a relatively common occurrence in sweet corn, cone tips caused by oil are more pronounced. Oil applied later than 8 days after silk initiation can result in more feeding damage to the kernels caused by caterpillars that entered the ear prior to the oil. There is a window between 5 and 8 days after silk initiation that provides the best combination of corn earworm control and ear fill. The timing can also be determined by husking a representative ear and examining the kernels. The ideal time to treat it is when the silk is still attached to the top 1" or less of the



The Zealator in action

kernels.

Materials: We recommend using corn oil or soy oil with an added Bt. Organically certified growers will need to use a dry formulation of Bt and add an emulsifier to the oil to keep the Bt suspended in the oil. We have had luck with liquid lecithin. Add 5% volume of liquid lecithin to the oil before adding the Bt mixed in water. Liquid lecithin is the consistency of molasses: we strongly recommend that you add it directly to the oil instead of measuring into a separate container first. Lecithin will mix more readily with oil than water, making cleanup difficult: be careful not to spill the lecithin. Use the labeled rate of Bt per acre in corn. Add this to the approximately 2 gallons of oil it takes to treat 1 acre. For the Dipel DF product that we used in our trials this translated to approximately 3 tablespoons of Bt per liter of oil for an application rate of 1/2 lb Bt per acre.

Cost: The cost per acre is approximately \$100-\$120 for labor (about 8-10 hours to treat one acre) and materials.

If you have any questions please contact Pam Westgate at westgate@umext.umass.edu or 413-545-3696.

MASSACHUSETTS 20TH ANNUAL TOMATO CONTEST 2004

City Hall Plaza Farmers' Market, Boston
Monday, August 16, 2004

Please join us for the 20th annual Massachusetts Tomato Contest. Sponsored by the New England Vegetable and Berry Growers Association in cooperation with the Massachusetts Department of Agricultural Resources, this friendly contest is designed to increase consumer awareness of local agriculture.

If you cannot attend the contest on Friday, tomato entries can be dropped off Saturday August 14th or Sunday, August 15th at several locations across the state. Tomatoes that are dropped off will be brought to Boston for judging. See reverse side for list of drop-off sites.

Schedule of Events:

- 9:00** am to **10:15** am – Tomato drop-off and registration
- 10:30** am – Judging of tomatoes by panel of experts
- 12:30** pm– Presentation of awards

Tomato Contest Criteria

FLAVOR: 10 points possible

The perfect tomato should have a strong tomato taste, be slightly acidic, juicy and fresh tasting with a tender skin.

FIRMNESS/SLICING QUALITY: 5 points possible

A desirable tomato should have a dense uniform thick wall with many seed cavities, completely filled with a jelly-like mass. The firmness of the tomato should be such that it will bruise if dropped, yet is not over-ripe or soft.

EXTERIOR COLOR: 5 points possible

The winning tomato has a uniform color, is free of green shoulders and has no evidence of blotchy ripening.

SHAPE: 5 points possible

Tomatoes come in different shapes and sizes, depending on the variety. Their shape should be symmetrical, but most important, the tomatoes in each entry should be uniform in size.

PRIZES

First, second, and third place tomato trophies will be awarded in all four categories.

Top 5 certificates will also be given in each category.

If you are unable to bring your entry(s) to Boston City Hall Plaza, please contact one of the following representatives to confirm drop-off entry(s). Drop off is scheduled for Saturday, August 14th or Sunday, August 15th from 9:00am - 5:00pm at the following locations. *Please submit included Registration form with entries.*

Southeastern Massachusetts:

- Noquochoke Orchards**, (508) 636-5230 (fax)
612 Drift Rd., Westport

Northeastern Massachusetts:

- Arena Farms**, (978) 369-3267
Rte. 2, Concord

Central Massachusetts:

- Stillman Farm** (978) 537-3342
1399 Lancaster Ave., Lunenburg
- Silvermine Farm**, (508) 865-5335
96 Eight Lots Rd., Sutton

Western Massachusetts:

- Round Hill Orchard**, (413) 562-4985
Douglas Rd., Southamptn, (Rt. 10, Westfield/Southampton Line, ¼ mile North of The Purple Onion on Left).

For more information regarding the Tomato Contest please contact David Webber at (617) 626-1754 or David. Webber@state.ma.us

Vegetable Notes, Ruth Hazzard, editor and Ben Hunsdorfer, Assistant Editor. *Vegetable Notes* is published weekly from May to September 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 is R. Hazzard if none is cited.

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.

REGISTRATION FORM

PLEASE SUBMIT WITH TOMATO ENTRY(S)

Farm Name: _____

Contact Person: _____

Address: _____

City: _____, MA Zip Code: _____

Phone: (____) _____

Please fill in the variety name for every entry: (Limitations to Entries: Growers are limited to the following: Slicing and Cherry tomato category - 2 varieties each, Heirloom - 3 varieties and Heaviest -1 variety).

Category: _____ Official Use Display Plate # _____

Heaviest: _____

(Heaviest entry should be at least half ripe to qualify).

Slicing Tomato #1 _____

#2 _____

Cherry Tomato #1 _____

#2 _____

Heirloom Variety #1 _____

(slicing) #2 _____

#3 _____

Numbers of Tomatoes Needed Per Entry by Category

Heaviest - 1 tomato

Slicing - 5 tomatoes

Cherry - 12 tomatoes

Heirloom (slicing) - 5 tomatoes

REGISTRATION FORM

PLEASE SUBMIT WITH TOMATO ENTRY(S)

Farm Name: _____

Contact Person: _____

Address: _____

City: _____, MA Zip Code: _____

Phone: (____) _____

Please fill in the variety name for every entry: (Limitations to Entries: Growers are limited to the following: Slicing and Cherry tomato category - 2 varieties each, Heirloom - 3 varieties and Heaviest -1 variety).

Category: _____ Official Use Display Plate # _____

Heaviest: _____

(Heaviest entry should be at least half ripe to qualify).

Slicing Tomato #1 _____

#2 _____

Cherry Tomato #1 _____

#2 _____

Heirloom Variety #1 _____

(slicing) #2 _____

#3 _____

Numbers of Tomatoes Needed Per Entry by Category

Heaviest - 1 tomato

Slicing - 5 tomatoes

Cherry - 12 tomatoes

Heirloom (slicing) - 5 tomatoes

