UMASS EXTENSION

VEGETABLE IPM MESSAGE

AUGUST 30,2001 VOLUME 12, NUMBER 16

CROP CONDITIONS

Harvesting of main-season crops (tomato, pepper, corn, summer squash, zucchini, cucumber, eggplant) continues at an intense pace, and harvest of fall crops (pumpkin, winter squash) is beginning. Potato and onion harvests are well underway. Sweet corn crops are generally very clean, though dry weather is having an effect on tip fill where irrigation is lacking. Western Mass is extremely dry, with little or no rain this month. The same is true for most of Vermont, New Hampshire and Maine. Central and eastern Mass. have had some rain, but growers are irrigating wherever they can to provide enough water to crops. In contrast, southeastern Mass has had adequate or more than adequate rainfall, and new outbreaks of *Phytophthora capsici* are being reported. ***Phytophthora infestans* (late blight)** has been found in tomato; see page two for details.

TWILIGHT MEETING, SEPTEMBER 10: ALLANDALE FARM

Location: 259 Allandale Rd., Brookline, MA

Time: Monday, September 10, 5:00-7:30 p.m.

Questions: Contact Frank Mangan @ (978) 422-6374

Allandale Farm is one of the oldest farms in the country. It is one of only six inside Rte 128, and the last inside the Boston city limits. It is located on the Brookline/Jamaica Plain line and is a part of a larger privately owned parcel dedicated to land conservation. It is a family-owned and operated enterprise raising about thirty-five acres of row crops, 95% of which are marketed directly through their own roadside market. The farm is organic, though not certified. They grow a wide variety of vegetables. The field and retail staff are hired locally. They also run a school and a summer education program for small children. Highlights of the meeting will be new Brassica species for expanding markets, pumpkin and tomato disease management; trickle irrigation systems; and cut flower operation.

Does driving into the heart of Boston during rush hour seem like a crazy idea? Remember that we'll be going IN when everyone else is heading OUT of the city. Take an evening away from the farm and join us for an exciting tour!

Directions: **From Route 9 at Route 128:** Take Route 9 east to Hammond Street in Brookline. Turn right on Hammond Street (after Copy Cop). When you get to the rotary, take the 4th right turn out of the rotary onto West Roxbury Parkway. Make a left turn at the end of the divider onto Newton Street. Make a right turn at the Exxon Station onto Grove Street. The next left is Allandale Road. The farm is located 1/2 mile on the left.

From Route 1 at Route 128: Take Route 1 North from Route 128 and Dedham. At the end of the VFW parkway, bear left onto Center Street. At the first light, make a left turn onto Allandale Street (just before Faulkner Hospital). The farm is 6/10 of a mile on the left.

From Boston: Take Route 1 south to the end of the Jamaica Way. Follow the signs for Faulkner Hospital (H signs), Dedham and West Roxbury. Turn right at the light at Faulkner Hospital onto Allandale Street. The farm is 6/10 of a mile on the right.

From Brookline Village: Cross Boylston Street and follow High Street to Stevens Market; turn left and then left again in front of the nursing home. Then bear right onto Perkins Street and bear left onto Goddard Avenue to the light. Go straight through the next light and turn left after the Exxon station onto Allandale Road. The farm is ½ mile on the left.

From the MASSPIKE: Get off at Rte 128 and go south; then follow directions as if on Rte 9 East.

TOMATO AND POTATO: LATE BLIGHT ALERT!

Late blight, *Phytophthora infestans*, has been found in tomato at two locations in western Massachusetts -- Conway (west of the Connecticut River) and Belchertown (east of the Connecticut River). Both samples have been confirmed by the Disease Diagnostic Lab at UMass. Both occurrences were in tomato fields that had not received fungicide applications.

The occurrence of late blight is a bit of a surprise, given the hot, dry conditions and lack of rain over the past month in western Mass. Belchertown did have one episode of 6 inches of rain about three weeks ago, but the other location has had no rain for weeks. However, nighttime leaf wetness periods from dew have lasted 11-13 hours on many nights over the past three weeks. As the days and nights cool down, long dew periods continue, and in the event that we get some rain, late blight could develop in other locations.

To monitor for late blight, inspect plants for infected stems and leaves with small to large, pale green to black spots, sometimes with a purplish tinge, which may enlarge rapidly to kill the entire leaflet. The underside of the leaf develops a fine white fuzz of sporulation, especially in moist conditions. Lower green leaves, stems, fruit and growing points can all be infected before leaf spots become obvious on the foliage. Tomato fruit develops a firm, olive to mahogany lesion, usually at the stem end. As disease progresses, fruit lesions become soft. Foliage becomes extensively blighted. The disease can move rapidly through an entire field. **Since late blight can be a region-wide disease, it is important to monitor both tomato and potato crops carefully. If you see any signs of late blight, call the Disease Diagnostic Lab or submit a sample to the lab (413-545-1045 or 545-1667).**

Tomatoes and potatoes are both at risk at this point in the season. Potato crops that have been vine-killed do not need further fungicide treatment for late blight. However, where potato vines are still green, fungicide should be applied to prevent infection of tubers. Tomato growers should tighten their fungicide schedule to maintain preventative coverage against late blight. Labeled products in tomato include Quadris, Bravo, Maneb, Manex, copper products, and Dithane. In addition to the above fungicides, Acrobat and Curzate are also labeled for potato and would be expected to provide better control.

The following TOM-CAST table applies to early blight only; given the presence of late blight in the region, tighter fungicide schedules are recommended.

DSV VALUES, AUGUST 15-29, 2001
SOUTH DEERFIELD RESEARCH FARM

Date	DSV's/Day		Date	DSV's/Day
Aug 15	1		Aug 23	1
Aug 16	1		Aug 24	2
Aug 17	1		Aug 25	1
Aug 18	2		Aug 26	0
Aug 19	2		Aug 27	0
Aug 20	2		Aug 28	2
Aug 21	2		Aug 29	1
Aug 22	1		Total for past 14 days	19 DSV's

-- J Howell, R Wick, S DeGray, R Hazzard

SCLEROTINIA BLIGHT IN TOMATO

Sclerotinia blight (also known as **white mold**) was observed this week in a field of ground tomatoes. Infections may have occurred during the wet period in May and early June. Irrigation may have provided conditions for symptoms to grow worse.

Symptoms of this disease are most apparent in the stem, where stems are in direct contact with the ground. Sections of stem turn a bleached gray or white, like animal bones dried in the sun. White cottony mold (mycelia) grows on infected stems, and black hard irregular-shaped nuggets (about ¼ inch in size, called sclerotia, "sklare–oh-shu") form on the outside and inside of the stem. Foliage above the infected stem wilts and dies. Fruit may also be infected. The presence of black sclerotia help distinguish this from other diseases that produce a white fuzzy mold such as ***Phytophthora***.

The disease develops only when soil is at field capacity for about 10 days and temperatures are relatively cool. These

conditions cause sclerotia to germinate and release spores. Spores infect senescent tissue such as fallen flower blossoms. Once established, the fungus invades healthy tissue. There is generally only one infection period in each growing season unless new sclerotia are brought up near the soil surface through tillage practices and favorable environmental conditions reoccur. Chemical applications are useful only during the initial infection period. Once the disease is established, fungicides are of no value. Infections spread to new tissue only through direct contact with other infected tissue.

Sclerotinia blight is a disease that is difficult to manage. Susceptible crops include tomato, beans, lettuce, cabbage and other crucifers, peppers, and potato as well as agronomic crops (alfalfa, canola, soybean, sunflower), and weed species (ragweed, velvet leaf). The sclerotia (the hard black structures) allow the fungus to survive for many years in the soil. The sclerotia look like large mouse droppings and are usually embedded in the fruit and stems of the plants. A single head of cabbage can have thousands of sclerotia.

If practical, remove diseased plants and fruit from the field. Plowing will preserve the sclerotia in the soil but will put them at a depth that will inhibit germination. Discing will tend to place the sclerotia in a more favorable place to germinate. Like many seeds, sclerotia will only germinate when they are within an inch of the soil surface. Improving drainage by chisel plowing would also be of value. Rotate with non-susceptible crops such as corn.

--R. Wick and R. Hazzard

CRUCIFERS

Watch for caterpillars, especially **cabbage looper.** A large new hatch is being reported in some Connecticut Valley fields. Loopers are smooth (not fuzzy like i**mported cabbageworm**), green with longitudinal stripes, and even when they are quite small make a "loop" as they move (like an inchworm). Loopers feed on outer leaves but will move into cabbage or broccoli heads and cause significant feeding damage as they grow. They will reach 1 ½ inch in length when full grown. Brassica leafy greens are also susceptible. Scout crops and note % infested plants. Spray at 35% for pre-cupping cabbage, 15% for cupping cabbage, and 10-15% for leafy greens. Materials that work for other caterpillar pests are effective against looper.

Scout for **downy mildew**(see Aug 26 issue for symptoms and recommended controls.)

--D Riggs, R Hazzard

PEPPER: BLOSSOM END ROT

Blossom end rot was reported on banana peppers in the Connecticut River Valley. This field was irrigated, but probably received infrequent, heavy applications rather than regular, smaller watering sessions.

From the *Northeast Pepper IPM Manual (Physiological Disorders, by Chris Wien, NYS):* These disorders appears as sunken black areas or spots on the side and bottom half of the pepper fruit, which arise when the fruit is growing rapidly or has just reached full size. Blossom end rot is caused by a calcium deficiency in the pepper fruit. Calcium is needed for the formation of cell walls and membranes. It is translocated into the plant in the transpiration stream, but little is distributed to the fruit because water flow through the fruit is inhibited by its waxy surface. In addition, calcium translocation to the flanks and bottom of the fruit is also slow. The disorder occurs when the growth rate of the fruit is faster than the ability of the plant to supply calcium to it. Such fruit growth fluctuations can occur when the plant is exposed to alternating wet and dry periods, and is the reason why uneven moisture supply is frequently associated with high rates of blossom end rot.

To reduce incidence of blossom end rot, calcium levels should be adequate in the soil, and the soil pH should be maintained between 6 and 7. Avoid ammonium sources of fertilizer, and excessive amounts of magnesium, because both these ions compete with calcium for uptake by the plant. Use of calcium nitrate as a nitrogen fertilizer source may help in areas where blossom end rot is prevalent. Foliar sprays of calcium are seldom

practical because calcium is poorly absorbed by the plant, and applications would have to be made weekly during the fruit growth period. Providing an even moisture supply through trickle or sprinkler irrigation is the most effective method of preventing blossom end rot, because it reduces fruit growth fluctuations. Similarly, maintaining healthy roots by avoiding root pruning or exposure to excessive salt concentrations (e.g. NH_4, K) will reduce blossom end rot incidence.

--G Murphy, R Hazzard

CUCURBITS

Scout all cucurbit fields for **downy mildew**, which is causing rapid decline of foliage in some butternut fields. Scouting is worthwhile because it is easy to assume this decline is from **powdery mildew**, especially when powdery mildew is also present on the leaf. Different fungicides are needed to provide control. Powdery mildew has white, powdery lesions on both upper and lower leaf surfaces. Downy mildew tends to begin with yellow lesions on the upper surface, with sporulation on the underside of the leaf only. Call the Disease Diagnostic Clinic (413-545-1045) if you have questions about what is in your field. Applications of Ridomil/Bravo appear to be providing good control in fields that were infected with downy mildew.

Pumpkin and butternut quality are excellent where fields have had adequate water, but we are seeing some smaller fruit size where fields have been dry.

PHYTOPHTHORA WATCH: RESEARCH STUDY CONTINUES.

Samples wanted. This year, the Vegetable IPM program is trying to learn more about **Phytophthora blight** of cucurbits and peppers in southern New England. We are making field visits to collect isolates of ***Phytophthora capsici*** for study. We will be investigating mating types (which relate to pathogen survival in soil), fungicide resistance, and host range. The host range studies are designed to look at whether or not squash isolates are pathogenic to pepper and visa versa. Historically, it has always been believed that squash isolates are pathogenic to pepper but there have been reports that some isolates have a more restricted host range. This information would be very important for recommending appropriate crops for rotation. We will also be trying to improve our ability to detect Phytophthora in irrigation ponds and pond mud. We are inviting farmers to participate. **If you believe you have an outbreak of P. capsici in cucurbits or peppers, call the Plant Disease Clinic** at (413) 545-1045 and notify Rob Wick. We may ask you to mail in or hand deliver a specimen for conformation, but we will try to visit as many farms as possible.

Phtophthora watch: In some parts of the state, we have had enough rain in the past month that low-lying areas in some fields may have had standing water for periods of time after heavy rains. In fields with crops that are susceptible to *Phytophthora capsici* –which includes all the vine crops, pepper, tomato, and eggplant – these low spots are sites where a Phytophthora outbreak could begin. Outbreaks have been reported in vine crops and peppers in Southeastern Mass.

We know that many soils around the state are infected with Phytophthora spores from outbreaks in past years. These resting spores (oospores) are most likely to germinate when there are alternating periods of dry soil followed by saturation. Standing water (or fully saturated soil) and warm temperatures are ideal conditions for spores (both oospores and sporangia) to germinate and release the swimming zoospores. These mobile spores will travel through the soil water, in surface water, in splashing water, or aerially in windblown rain to infect leaves, roots, crowns, or fruit. Once established, the fungus produces a yeast-like growth that contains many sporangia. Sporangia are lemon-shaped structures that cause new infections as they disperse into the rest of the field.

The best control for this disease is to never allow that initial infection to start. Take measures to reduce standing water by sub-soiling between beds or rows, and removing soil barriers that might keep water from draining out of the field. Scout low-lying pockets for signs of infection. In pepper, look for black lesions on the stem or circular, grayish brown lesions on leaves. In cucurbits, look for seedling damping-off, crown rot which

causes the whole plant to collapse and die in a short period of time; or dieback on the growing tip. The initial symptoms of fruit rot are a water-soaked or depressed spot, often on the underside of the fruit or near the stem. Small pockets of vine crops or peppers, which have sat in standing water, can be tilled under before an infection starts. The destruction of a few plants is better than the possible loss of a whole field!

Where there is a high risk of pepper crown rot (i.e. growing peppers in a field with a known history of the disease, or where sypmptoms occur), mefanoxam (Ridomil Gold 4E at 1 pt/A or Ultra Flourish 2E at 1 qt/A, with rates adjusted for banded application) can be applied through trickle irrigation under plastic or as a directed spray in a 6-10 inch band on either side of the row in bare ground culture. If foliar symptoms are found in pepper, Ridomil Gold/Copper or copper applications may slow the development of the disease.

CERCOSPORA LEAF SPOT ON SWISS CHARD

Cercospora leaf spot on swiss chard has been a problem this year. Symptoms are spotting and blighting of leaves. The fungus can be seed-borne but may overwinter on plants in the same plant family. Copper is registered to control this disease. Plow infected debris under to hasten destruction of the fungus, and rotate out of this crop family for two years. Copper applications should be made at the very first sign of disease symptoms. Avoid dense plantings and shady areas, and encourage good air circulation.

SWEET CORN

European corn borer captures declined this week. Although we are past the peak flight, we are very likely **in** the most active period of new egg hatch and infestation of ears in silking corn. Captures are still high and we can expect new hatch for 2-3 more weeks (pepper growers take note!) Maintain a 6-7 day spray schedule for corn borer, or tighter (3,4 or 5 days depending on local captures) to control both ECB and corn earworm. **Corn earworm** numbers rose in the Southeast, and at many other locations—including the Berkshires, Central Mass, and Connecticut Valley. Low counts were reported at a few locations. With the level of variation within regions, having one's own trap is highly recommended! Note that captures are higher in FRESH silk than in brown silk –keep moving your trap to fresh blocks! For **aphids**, Warrior or Lannate applications for worm control will also suppress aphids. We notice that serious aphid outbreaks rarely occur in corn fields where broad-spectrum materials have never been used. When corn earworm pressure is high, Lannate has been reported to produce mixed results; while some growers report excellent control, others have problems. Materials with a longer residual period, such as Warrior or Larvin, are recommended under high CEW pressure. Effective control depends on maintaining residue on the silks.

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

Note: spray intervals can be lengthened by one day if daily maximum temperatures were below 80°F for the previous 2-3 days.

In a dry year, the biggest problem in sweet corn can be **bird damage.** While no tool is effective for very long, it is best to focus your resources on fields that have less than 14 days to harvest. The most effective bird deterrent seems to be the audible bird distress calls. The speakers need to be pointed directly into the fields needing protection. Fields next to the speakers do not receive the same protection as the ones getting the full blast from the speakers. Speakers should be moved weekly to increase effectiveness. Balloons, cannons and other techniques will work for a short time but birds seem to eventually overcome most efforts to keep them away. Combinations of techniques seem to be the best bet to keeping birds out of corn. Remove protective devices from fields where the harvest has just finished, so that birds can glean from those fields.

--Adapted from John Mishanec, NYS

SWEET CORN TRAP CAPTURES AND SCOUTING DATA AUGUST 24-30

Town	Date	ECB Z1	ECB E2	TOTAL ECB	CEW	% PT
Berkshire Region						
N. Bennington, VT	August 28	22	6	28	7	--
Stephentown, MA	August 29	3	0	3	7	--
Sheffield	August 28	9	15	24	1	--
Conn. River Valley North to South						
Westminster, VT	August 28	11	98	109	2	--
Putney, VT	August 28	17	5	22	1	--
Plainfield, NH	August 29	9	0	9	0	6%
Hatfield	August 27	0	7	7	--	0%
South Deerfield	August 28	4	7	11	7	--
Whately *	August 28	25	13	38	--	--
Hadley	August 28	5	--	5	21	--
Amherst	August 29	14	14	28	10	--
Southwick	August 28	15	11	26	12	--
Feeding Hills	August 27	2	6	8	--	--
East/Central MA, North to South						
Ipswich	August 28	3	5	8	--	18%
Dracut	August 28	17	52	69	8	--
Stow	August 29	10	9	19	10	--
Bolton	August 29	7	17	24	1	--
Sutton	August 29	45	25	70	18	--
Monson	August 29	3	2	5	--	--
Leicester	August 29	4	3	7	--	12%
Millis	August 27	8	9	17	22	--
Hopkinton	August 27	6	6	12	18	--
Seekonk	August 29	8	5	13	25	--
Swansea	August 28	5	15	20	98	--
Rochester	August 28	10	23	33	65	--
Rehobeth	August 29	5	10	15	55	--
Little Compton, RI*	August 29	25	17	42	98**	--

* Next to Pepper Field. **Trap was placed in fresh silk; on the same farm, a trap in brown silk caught 15 moths

--Not available

Vegetable IPM Newsletter, Ruth Hazzard, editor. Stephanie DeGray, Assistant Editor. The Vegetable IPM Newsletter is published weekly from May to September and includes contributions from the UMass Extension Vegetable Program faculty and staff, growers, and private IPM consultants. Authors of articles are noted; author is R. Hazzard if none is cited.

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