



VEGETABLE IPM MESSAGE

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CROP CONDITIONS

Many areas of Massachusetts received a drenching of two inches of rain last weekend, leaving already saturated soils too wet to work. However, this week's dry sunny weather has allowed field work to progress and crops have started growing again. Most crops are on schedule, warm-season crops are planted, and early-season crops growing well. Nutrient problems have been occurring in some fields. While earlier concerns about poor performance of herbicides in dry soils are no longer a problem in new plantings, some growers are seeing poor weed control in early corn as a result of the dry conditions in May. Early greens are ready for harvest, and many CSA farms are now opening their doors to shareholders. Be ready for cucumber beetle, Colorado potato beetle, and European corn borer!

TESTING YOUR GROWING MEDIUM FOR GREENHOUSE TOMATOES

Recently, some greenhouse tomato growers have noticed leaves and fruit that are discolored and think they have a disease. In some cases this discoloration is caused by a nutrient imbalance and not a pathogen. Nutrient levels in the growing medium that are either too high or too low can cause discolorations in the leaves that can be mistaken for lesions caused by pathogens.

The only way to be sure that your nutrient regime is sound is to have your growing medium tested. Even if your plants are growing fine, it is still recommended to have the medium tested

if you haven't already. This way, if a problem develops, you will have the test analysis results available to help rule out certain issues.

Some operations have their greenhouse crops growing right in the soil. This situation can sometimes lead to the buildup of fertilizer in the root zone which can cause high salinity. The concentration of fertilizer in the root zone can become so high that water is not readily taken up by the plant. The plants will wilt even though you are adding water. A telltale sign of salinity problems in a greenhouse situation is that the plants will wilt more readily when it is sunny.

Make sure when you send in a sample to the UMass lab for analysis that you identify the medium (soil, soilless, or combination) and that you state that it is a greenhouse crop and you want soluble salts measured.

--Frank Mangan and John Howell

EFFECTS OF COOL TEMPERATURES

The past week brought cool night temperatures, with lows in the 40s or 30's in Massachusetts and other New England states. Warm season crops including squash, melons, and cucumbers may show signs of chilling injury and sunken spots on the leaves. If the soil is not warmed by plastic, slow root growth and even root death can occur. Flower and fruit development are also affected by cool temperatures. Effects on fruit will persist well after the weather has warmed up.

In cucumber, squash and pumpkin, the cooler temperatures promote development of female flowers rather than male flowers. For some summer squash, this may mean that some

female flowers open before any male flowers are open. If that occurs, and the female flowers do not get pollinated then some fruit may abort.

Pepper fruit shape is affected by low temperatures. Night temperatures 45 to 50 °F during flower development can cause the fruit to be smaller than normal and somewhat flattened, sometimes with a point on the blossom end. With night temperatures of 55 to 60 °F pollen may not develop properly causing some fruit to be small and seedless.

Tomato flower clusters respond to low temperatures with increased branching and larger flowers when exposed early in development (weeks before buds are visible). Temperatures of 60 °F days and 50 °F nights, 4 to 5 weeks before flowering of a cluster, may increase the amount of catfaced fruit (large, misshapen fruit with large blossom-end scars). While we see the slowed crop growth now, the effects on fruit won't be apparent for weeks or months.

-adapted from Liz Maynard, Purdue University

CRUCIFERS

Cabbage root maggot damage is showing up in some untreated fields of brassicas that were transplanted in early to mid May. Plants wilt, leaves turn reddish or yellow, plants become stunted and die. Symptoms may develop quite suddenly. Examination of roots shows feeding damage (tunneling or scarring) and rotting on the below-ground stem and roots, or complete absence of roots. White, legless maggots up to one-third inch in length can be found in the soil near the roots or in tunnels. Damage may be concentrated patches, such as along a single row or in wetter areas of the field, or scattered throughout. Rescue treatments of soil drench directed to the base of the plant may be helpful if there are maggots present but little feeding damage has been done; however, the best control is achieved with treatment before eggs hatch. Note days to harvest restrictions for soil drenches. Generally plantings set out in late May and June do not require treatment. Reports from fields scouted in southeastern MA indicate low egg numbers; however, many of these plantings were late due to dry, then wet conditions. Organic growers

have few options once exposed plants have become infested with maggot. A light hilling/cultivation to encourage new root growth from the stem may help.

As early brassicas reach heading stage pay attention to **caterpillars**, especially **imported cabbageworm** and **diamondback moth**. Scout undersides and tops of foliage. Feeding damage is often easier to spot than small larvae. Check 25 plants and note % infested. Treat heading cabbage if 20% of plants are infested; cauliflower or greens if 10-15% are infested. Use of a 'biorational' product such as spinosad (Spintor 2SC at 3 oz/acre) or Bt products (*Bt aizawi* or *Bt kurstaki*) will give effective control of caterpillars with a short REI and DH interval and low impact on natural enemies or risk to handlers.

--Ruth Hazzard & Mike Yates

SWEET CORN: TIME TO SCOUT

Early corn that was started under plastic is in pretassel stage (tassels ready to emerge) and should be scouted for **European corn borer** larvae. Moths have been active for two weeks and hatch of new larvae can be expected within the next week. Reports from the Southeast indicate no larvae were found in pretassel corn on any scouted fields this past week, even where captures were in excess of 200 moths/week. Most sites reported captures of 10-30 moths per week with the E (New York) strain at higher numbers than the Z (Iowa) strain. One grower reported that his transplanted corn is in full tassel. The earlier the corn, the more likely it is that silk stage will be reached before ECB flight declines, with higher risk of infestation of ears. Even if tassels were not infested, new eggs may be laid near the ear, and larvae move directly into the ear. In this situation it is very helpful to have traps on your own farm so you know when flight declines. Weekly sprays on silk are needed to control ECB during silking, as long as captures remain high (above 5 per week).

It's a good idea to get **corn earworm** traps up in time to detect flight as soon as corn silks! Early, small flights can be a factor --too often, an unpleasant surprise -- for corn that silks in late

June. Traps in Seekonk, Swansea, and Rochester captured 1-2 corn earworm moths last week. This may be primarily a coastal phenomenon, but there's no guarantee.

-R. Hazzard & M. Yates

POTATO

Colorado potato beetle is actively colonizing fields; eggs can be expected soon. Watch beans and potatoes for **potato leafhopper**; this pest can easily go undetected and can cause significant damage at relatively low numbers. Leafhoppers were reported in New Jersey last week so could arrive in New England anytime if we get winds from the south.

Wanted: growers who have used Spintor for CPB control. A multi-state study is seeking to collect CPB adults from fields where Spintor has been used for one or more years, to test for new resistance development. Please contact us at 413-545-3696 if we could collect some beetles from your field!

CUCURBITS

Striped cucumber beetle is becoming active and numbers are likely to jump rapidly this week. Direct-seeded pumpkin, winter squash, melons and cucumbers that are just emerging, as well as transplants that are still young are highly susceptible to both feeding damage and transmission of bacterial wilt, which is vectored by the cucumber beetle. The cotyledon up to the five-leaf stage is most susceptible. Beetles are very mobile and can build up rapidly, so fields should be scouted at least twice a week. Activity tends to be high during hot sunny weather. Look for signs of feeding on the underside of leaves, especially the cotyledons. Beetles are often found underneath leaves or in cracks in the soil. To scout, check sets of 5 plants in at least five areas of the field (25 plants total), counting number of beetles on or near the plant. Check field edges for concentrations or hot spots. Beetles often colonize from field



edges and numbers will be higher in the first rows near a woods or fallow area. Border treatments may help reduce infestation of the whole field.

Research conducted recently on Long Island by Margaret McGrath (Cornell University) provides us with good new information on differences among cucurbit crop types and among varieties in attractiveness to beetles and in occurrence of wilt. This information will be helpful for tailoring management programs and choosing less susceptible varieties. The following is excerpted from McGrath's report on her 1999 and 2000 research:

One important finding was that attractiveness to beetles was not always related to wilt susceptibility. For example, although fewer beetles per plant were observed in cucumber than in most other cucurbit crop types, and little feeding injury was observed, a higher percentage of cucumber plants developed wilt. Muskmelon had similarly low beetle densities but less wilt than cucumber. Compared to cucumber, zucchini was more attractive to beetles and less susceptible to wilt.

The gourd Turk's Turban (*Cucurbita maxima*) was very attractive to beetles and was severely affected by wilt, differing substantially from Pear Bicolored (*Cucurbita pepo*). This documents an important difference between these species that most likely extends to other gourds. Initial symptoms of wilt were first seen 13 and 19 days after cucumber beetles were first seen in 2000 and 1999, respectively. In the absence of insecticide treatment, all Turk's Turban plants died before producing fruit while about 25% of the Pear Bicolored plants died by late August.

Differences in wilt occurrence were also detected among pumpkin varieties. This was not related to attractiveness to cucumber beetles or to damage from their feeding, which suggests these varieties differ in their susceptibility to wilt. A high percentage of Merlin plants developed severe wilt (at least 50% of the plant affected) by late August in both years (89-97%). Magic Lantern was also severely affected in 2000 when insect and disease pressure was higher than in 1999 (98% in 2000 versus 22% in 1999). These varieties did not have more beetles per plant or more feeding injury than Harvest Moon and Howden. Percentage of plants of these varieties that were severely wilted was 3% and 13% in 1999 and 53% and 58% in 2000, respectively. The more susceptible varieties

TWILIGHT MEETING JUNE 11, BRAMBLE HILL FARM

Topics: Strawberry annual production system, livestock, vegetables, buy local campaign.

Monday, June 11, 6:00 - 8:30 p.m.

Bramble Hill Farm, 593 South Pleasant St., Amherst, MA

Contact: Sonia Schloemann, (413) 545-4347

Come learn about a newly established annual strawberry production system being used at this and other farms, as well as a unique mulching system using waste wool from their sheep. Livestock, vegetables and greenhouse crops are all integrated into this farm system. Bramble Hill Farm consists of 128 acres of rolling pastures and cropland.

Founded in 1997, Bramble Hill Farm is owned by the Open Field Foundation, a non-profit educational corporation dedicated to the promotion of agriculture, open space and public education. The farm currently markets USDA natural lamb; certified organic vegetables, herbs, and flowers; and wool products directly to local retailers and restaurants and is actively involved with the "Be a Local Hero - buy local!" campaign in the Connecticut River Valley.

Directions: Bramble Hill Farm is located at 593 South Pleasant St. (Rt. 116) in Amherst. Travel south on Rt. 116 from the center of Amherst for about a mile and Bramble Hill Farm is on your right.

Vegetable IPM Message, Ruth Hazzard, Editor. The Vegetable IPM Message 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. Send comments or questions to rhazzard@umext.umass.edu, 413-545-3696

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have powdery mildew resistance (PMR). Fortunately there does not appear to be a general correlation between wilt susceptibility and PMR as the PMR muskmelon and yellow summer squash varieties examined in this study (Eclipse, Athena, and Sunray) were not more susceptible to wilt than the other varieties examined.

Waltham Butternut (*C. moschata*) had fewer beetles and less feeding damage than other winter squash varieties, and it was the last to develop wilt symptoms, which were not seen until 15 Aug 2000. It was less susceptible than Golden Delicious or Blue Hubbard; Table Ace and Burgess Buttercup were intermediate. Winter squashes Golden Delicious and Blue Hubbard had higher beetle densities, more feeding injury and higher incidence of wilt than Waltham Butternut and Table Ace.

Watermelon is considered not susceptible to bacterial wilt. It is also less attractive to beetles than most other cucurbit crops.

The pickling cucumber County Fair, which is reported to be wilt resistant, was substantially less susceptible to wilt than the other two varieties examined (7% wilted versus all Dasher II and Calypso plants wilted by 22 Aug). Similar to pumpkin, this was not due to differences in beetle attractiveness as there were no significant differences among cucumber varieties in number of beetles/plant or amount of feeding damage.

It is suspected that the pathogen varies regionally, however, which could result in regional differences in varietal response. Therefore, it is possible that some of the results obtained on Long Island may not extend to other areas.

Thresholds for treatment: For cucurbits that are highly susceptible to bacterial wilt, treat when beetles arrive in the field. For moderately susceptible varieties, a threshold of 1 beetle per two plants is recommended for foliar treatment. See *New England Vegetable Mgt Guide* for products. In the early stages of growth, insecticide use can be significantly reduced by only spraying the rows of plants and not the bare ground between them. This can be accomplished by using only the nozzles over the rows and shutting the others off.

-R. Hazzard and M. McGrath