Vegetable IPM Message
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Crop Conditions

Harvest of early summer squash and zucchini, greens, lettuce and broccoli is underway. The heat and sun of the past week has given warm-season crops a boost. Most crops are needing a nitrogen side-dress after all the leaching rains. A PSNT test might be a good idea a week or two after adding nitrogen fertilizer, when soils have recovered and more nitrogen is released from organic matter. Conditions have remained favorable for fungal and bacterial diseases, with high humidity, warm nights and frequent rain showers. Scattered thunderstorms have brought uneven amounts of rain to different parts of the state, ranging from 3 inches in the Berkshires to 0.3 inches in the Southeast. Many soils were packed hard by the rains and need cultivation to aerate and loosen the soil.

Now is the time to set up deer fencing to prevent damage later on! It is important to get fencing in place **before** your field becomes a favorite feeding site.

TOMATO, EGGPLANT and POTATO --and BEANS!

Colorado potato beetle (CPB) larvae have exploded in number and size as first-generation eggs hatched out and warm temperatures spurred rapid growth. Eggplant is very vulnerable at this time, with buds forming and only moderate leaf mass. Many potato fields are in the tuber initiation (initial bloom) to tuber bulking stage when insect defoliation is more likely to cause reduction in yield. CPB larvae pass through 4 instars (molts): the first two instars consume 8%, the third 15%, and the fourth instar 77% of the leaf matter require to complete their growth. So -- try to get control before the large "grubs" take their 80% out of your crop! Warm temperatures give you less time to turn your back. At 75 ^{o}F to 82 ^{o}F, larvae grow from first to fourth instar in 6-7 days. At 68 the same process takes two weeks. Spinosad (SpinTor) imidacloprid (Provado), Abamectin (Agri-Mek) and *Bt tenebrionis* (Raven, Novodor) all control larvae. Rotate materials for resistance management. For adequate control with Bt, target early instars. For organic growers who must rely on Bt, use high rates and repeat applications if larvae are large.

Potato leafhopper numbers are high. **Potato** and **green beans** develop "hopperburn" from feeding of adults and nymphs on stems and leaves. Although I don't find it in the literature, I have noticed active populations and similar symptoms in eggplant. I have also found leafhoppers in peppers but have seen no damage from this pest in peppers. The vascular system becomes plugged after feeding by leafhopper, which causes yellowing at the tips and margins of leaves. Leaf margins die, turn brown and roll inward. Beans show a bronzing and mottling of the whole leaf, which looks very much like a disease. Injured plants are stunted and yields are reduced. Scout by shaking plants and observing for the

quick flight of adults, by examining the undersides of leaves for nymphs, or by using a sweep net. Adults are light green, wedge-shaped (wider at the head), about ¼ to 3/8 inch long, and very fast-moving. Nymphs are similar, but brighter green, and do not fly. Low numbers can cause significant damage to beans and potatoes. The threshold for potatoes is one adult or nymph per 10 leaves. See *New England Vegetable Management Guide* for recommended insecticides. *(NOTE: Still don't have the '00-'01 edition? To order a Guide, get out your credit card and call UMass Extension Bookstore at 413-545-2717.)*

Potato leafhopper is a difficult pest for organic growers because there are few cultural or chemical options. Floating row cover can be used over snap beans until flowering (which also keeps out Mexican bean beetle), delaying infestations enough to get good yields. Pyrethrin-based insecticides have been used with reasonable success in potato but NOFA-approved materials are not currently available (to my knowledge). Late-season potatoes tend to be less susceptible to leafhopper.

In tomato and potato, protectant fungicides are recommended on a weekly schedule, to protect new growth (and old) from **early and late blight**. For tomatoes, include copper materials to provide activity against bacterial diseases. **Late blight** has been found in Albany County, eastern New York State, on tomatoes. It is possible this is a "tomato only" strain. Even so, it is highly recommended for growers to have protective fungicides on their potatoes and tomatoes. Recent and current weather conditions are conducive to late blight. Long periods of high relative humidity and leaf wetness (from rainfall, dew, fog, or irrigation) are very favorable for this disease. 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 higher the temperature, the more quickly disease progresses. The disease can knock down a field in five days if left alone.

It is very important to go out and scout your fields for late blight. Late blight lesions are dark green or black and large, about the size of a half-dollar. In the morning, before the humidity drops, you will see a ring of white spores around the lesion. Sometimes, if protective fungicide sprays have been applied previously, you will not see the lesions on the leaf but late blight spores can germinate at the axle of the leaf to the stem, turning the stem black for an inch above and below the axle. Check fields regularly, especially in poorly drained areas. If you see something that you think could be late blight, do not hesitate to call the UMass Disease Diagnostic Clinic, 413-545-1045 or 413-545-1667. See June 23 IPM Newsletter for recommended fungicides and control measures.

--L*ate blight alert adapted from John Mishanec, Cornell Cooperative Extension, Capital District, NYS)*

CUCURBITS

Fields of pumpkin and winter squash range from cotyledon to five leaf stage. Some that were re-stocked have a range of ages. **Striped cucumber beetles** have been joined by **spotted cucumber beetles** (also known as Southern corn rootworm), which are yellow green with 12 black spots and feed in corn as well as cucurbits. Larvae of both species feed on roots of host plants and both vector bacterial wilt. Of greatest concern at this time is direct feeding damage and transmission of bacterial wilt. In fields scouted this week, beetles seemed to be feeding most heavily on the undersides of cotyledons, even when older leaves were present. This may be due to the fact that cotyledons contain the most

cucurbitacin, which is feeding stimulant. Even when leaf damage is under 5%, we are recommending sprays for cucumber beetle if the numbers exceed **1 beetle per two plants** to prevent bacterial wilt transmission. Some fields are requiring more than one insecticide application. Numbers up to 5 per plant were found in untreated fields.

BLUE MOLD IN TOBACCO

All tobacco growers should be applying fungicide sprays to protect against blue mold. The disease has been found on plants in a UMass greenhouse. The plants have been destroyed. Dr. Rob Wick has looked into this and believes that these are new infections and that the disease did not over-winter in the greenhouse. The source is not known, but growers should assume that their crops were also exposed. The disease is in Pennsylvania and can easily move to the Valley on a weather front.

Blue mold spores infect wet leaves within 2 to 4 hours after landing on a leaf. The fungus undergoes a 5 to 7 day period without showing symptoms. After this, discolored to yellow spots appear on the upper leaf surface and under humid conditions, a blue to grey mold appears on the underside of the leaf. Spores are then produced at night and released in the morning under warmer and less humid conditions.

In Massachusetts, we have emergency labels for Acrobat MZ, Dithane, and Aliette. Acrogbat is a mixture of dimethomorph (a local systemic) and EBDC (a protectant). Dithane is a protectant EBDC fungicide. Aliette is a systemic fungicide, but sprays have to be applied prior to infection. Complete coverage is necessary.

For further information call: Dr. Rob Wick at 413-545-5307; Dr. James LaMondia, CT. Experiment Station at 860-683-4982; or John Howell at 413-545-5307.

-John Howell based on information from R. Wick and J LaMondia.

SWEET CORN

European corn borer captures are dropping, indicating we have passed the peak flight of the first generation. We will still be seeing hatch of newly laid eggs and plenty of borer feeding, so the fun is just beginning. Silking corn should be sprayed weekly for ECB that could move directly into the ear from leaves where eggs were laid or from feeding sites in the tassel. Scout blocks that are reaching pretassel stage -- just as the tassel becomes visible in the whorl -- checking for ECB larvae feeding in the tassel. You will see the black head and light-colored body even when larvae are tiny. Reports from scouted fields in MA (see table below) indicate high infestation levels, well above the 15% threshold for treatment. The best time for applications is just as the tassel emerges from the whorl. This reaches larvae that are moving from one feeding spot to another and are most likely to be exposed. Two applications (5-7 days apart) are likely to be needed at this time because new eggs are hatching and because in many cases infestation levels are high (>30%). Consider trying one of the new materials that is effective against ECB yet is safer for applicators and beneficial insects, and has a short re-entry interval. This includes spinosad (SpinTor 2EC) which can be used at the 3 to 4.5 oz rate (cost: about $4.50-4.70 per oz). A silicon adjuvant is recommended for sweet corn.

Corn earworm captures are zero **except** at several locations in the northeast (near the coast or in Merrimack Valley) and southeast. Silk sprays should be tighter where CEW is present (see table below). A corn earworm trap and lures for your own farm could be the

best investment you could make! Seventy dollars buys you a trap and lures for a season, a tool that can save you hundreds of dollars of ear damage in each acre of corn. You'll see new flights the day they arrive. Use the Heliothis Scentry white nylon net trap, baited with the Hercon luretape for corn earworm (*Helicoverpa zea*) Place in freshly silking corn with the base at ear height. Lures should be replaced every 2 weeks for optimum catch. Two sources for traps: Gempler's, (800) 382-8473;Great Lakes IPM, (517) 268-5693.

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 ^{o}F for the previous 2-3 days.

Crop rotation can be difficult for corn because it uses so much land relative to other crops in a diversified vegetable farm. However, fields in corn for many years can turn up special problems. One that I saw this week was **maize billbug** damage. These snout beetles bore holes into new seedlings when the leaves are rolled, feeding on the inner tissue. This may kill or damage the plant; those that survive have rows of holes in the leaf after it unfolds. Grains, rushes and cattails are also hosts. Eggs are laid in the stem and larvae feed on the pith of the stem and on fibrous roots. Crop rotation out of corn is the best control. I was interested to note that in a rotated section of the same field, about 300 feet away, I saw no billbug damage in young corn. Fall plowing and disking to disturb taproots where adults or pupae overwinter also helps.

Cutworm damage was observed in the same field. Stems or leaves of seedlings were clipped off and cutworms were in the soil nearby. If these soil insects are a concern, scout fields to determine if the damage warrants the cost and benefit of a control. Chlorpyrifos can be used against either pest as a banded or broadcast application preplant, at planting or pre-emergence (soil-applied) or at cultivation (directed at base of plants). Diazinon is

another option for cutworm.

SWEET CORN TRAP CAPTURES FOR WEEK ENDING JUNE 29, 2000

Town	Date	ECB Z1	ECB E2	TOTAL ECB	CEW	*PT % ECB
Walpole, NH	29-Jun	0	2	2	--NA	3%
Plainfield, NH	27-Jun	2	7	9	--	--
S. Deerfield	30-Jun	11	8	19	0	--
Sunderland	24-Jun	11	14	25	0	33
Southwick	24-Jun	14	16	30	0	

17

Haverill

26-Jun

7

14

0

0

25

Ipswich

25-Jun

14

22

36

11

18

Dracut

26-Jun

26

56

82

3

--

Lancaster

24-Jun

25

13

7

44

Concord

24-Jun

6

7

13

0

25

Northbridge

28-Jun

5

4

9

0

17

Millis

26-Jun

0

34

34

0

--

Rehoboth

22-Jun

43

95

138

2

45%

Seekonk

28-Jun

16

32

48

2

32%

Swansea

28-Jun

85

2

87

4

--

** % of plants infested with caterpillars in pretassel stage corn*

-- R. Hazzard. Trap captures from Mike Yates, Jim Mussoni, Ray Pestle, Rolf Parker, Roz Cook.

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. Special thanks to J. Kelley, S. Smith, J. Mussoni, M. Yates, R. Pestle for field information. **NEXT NEWSLETTER: WEEK OF JULY 10.** There will be no newsletter published July 6.

SWEET CORN TRAPPING DATA FOR WEEK ENDING JUNE 22, 2000						
						* % of plants infested with caterpillars in pretassel stage corn.
Town	**Date**	**ECB Z1**	**ECB E2**	**TOTAL ECB**	**CEW**	***PT % ECB**
Walpole, NH	6/21	5	2	7	-	1st larvae
Plainfield, NH	6/21	1	6	7	-	Whorl
S. Deerfield	6/22	5	23	28	-	--
Dracut	6/20	26	56	82	0	--
Millis	6/21	12	90	102	1	
Hopkinton	6/21	12	7	19	2	12
Seekonk	6/21	9	27	36	9	30
Rochester	6/21	31	175	206	29	64
Swansea	6/21	170	7	177	3	45

--Ruth Hazzard, Roz Cook, Mike Yates, Ray Pestle, Jim Mussoni

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