



VEGETABLE IPM MESSAGE

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CROP CONDITIONS

No one is complaining of cold nights and slow crop growth any more! Brutal heat is hard on field crews and is pushing crop growth along quickly. Now there is more likelihood of bunched-up harvest schedules than gaps in harvests in succession-planted crops like corn, lettuce, and other greens. Many Massachusetts farms were fortunate to receive enough rainfall last Friday and Saturday to relieve the dry conditions. Across the state quantities ranged from about ½ inch – 1 inch, with a few spots of up to 6 inches. Much of New England and states to the west of us received less, and dry conditions predominate throughout the region. We could still use more rain, and cooler temperatures would be very welcome.

Effects of **high temperatures** are likely to show up in susceptible crops, especially those where fruit set is occurring now. This includes abortion of flowers in beans, tomatoes and peppers, and absence or death of female flowers in pumpkins. Higher night temperatures (above 65 or 70) as well as daytime temperature are a factor. Cool season crops such as baby Bok Choi bolt quickly in the heat. Harvesting potatoes in hot weather increases the risk of Pythium leak.

Conditions are good for **bacterial soft rot** of fruit, leaves or stems wherever tissues are injured in any way, such as from insect feeding, mechanical injury or another disease. Preventing injury is the only way to prevent this; sprays don't help. If you see soft rot, look for damage that may have occurred earlier.

PHYTOPHTHORA NOTE

This summer, very little Phytophthora blight has been seen on cucurbits and peppers. We are just starting to see a few trouble spots. If you have Phytophthora blight please bring specimens into the Plant Disease Clinic, Rm 109 Fernald Hall on the UMass Amherst Campus or call Rob Wick at 413 545 1045. We need more specimens to carry out our survey.

If we get more rainstorms, or if irrigation results in puddling of water, watch for **Phytophthora capsici** outbreaks in any low, wet spots of fields with a history of the disease that are planted to vine crops, pepper or tomato.

--Robert Wick

PEPPER : CORN BORER IS HERE

Pepper harvest is underway in earnest, in both bare-ground and plastic/raised bed crops. **European corn borer** captures rose sharply this week and numbers are above the threshold of 7 moths per week at nearly all locations. It typically takes two weeks from the onset of flight before pepper fruit is attacked by borers. Insecticide applications should begin one week after the onset of flight, which means this week in some locations and next week in others (see charts of ECB captures in this and last week's messages or check your own traps). Given the extremely high temperatures, the rate of egg-laying activity and egg hatch may be accelerated, so the initial insecticide application could be needed slightly sooner where ECB numbers are high.

Insecticides for ECB should be applied at regular intervals during the second-generation flight period, especially in the next 2-3 weeks during peak flight when flights are well above the 7 moth/week threshold. The recommended interval depends on the material used. Acephate (Orthene, 7dh) or tebufenozid (Confirm 2F,7dh) can be applied at 10-14 day intervals; spinosad (SpinTor, 1 dh) or permethrin (Pounce, Ambush, 3 dh), at weekly intervals, and Bt products (Matth, Crymax, Javelin, 0 dh) twice weekly.

Permethrin products will cause aphid outbreaks by destroying beneficials which keep aphids in check. Orthene provides good aphid control. Spinosad, while not having activity against aphids, has the advantage of conserving beneficial insects such as ladybeetles, which can reduce resurgence of aphids in crops such as peppers and sweet corn. The one-day pre-harvest interval and four-hour re-entry interval makes it particularly useful in peppers or eggplants where harvest periods coincide with heavy pest pressure and the need for regular sprays. It has also shown excellent control of European corn borer and fall armyworm in sweet corn. Rates of 3 oz are adequate in pepper and brassicas, and 3-4.5 oz in corn, which helps keep the cost per acre down. Limited to 2-3 consecutive applications or 29 oz per crop to prevent resistance. Caution should be used to avoid exposing bees to direct spray, as it is toxic to bees.

Scout for **green peach aphids** by checking 4 leaves per plant on 25 plants. If numbers exceed an average of 10 aphids per leaf, controls are needed to prevent an outbreak that could impact plant growth and cover fruit with honeydew and sooty mold. Insecticides with good efficacy against aphids include Orthene, Provado (0 DH), Dimethoate, Horticultural oil, insecticidal soap, Metasystox-R. Of these, only Orthene also controls ECB. In bell peppers which are harvested frequently, growers can manage the 7 Dh restriction for Orthene by picking half the field, then treating immediately, then coming back in 7 days for the next pick.

Scouts report ongoing presence of bacterial leaf spot in some fields. Hot conditions favor **bacterial leaf spot** infections, so scout for this disease and apply copper products if it is present.

Check label for preharvest restrictions, which vary with different products.

WATCH FOR SPIDER MITES

Be on the lookout for the buildup of aphids and spider mites. Both these pests can quickly build to damaging levels under the hot dry conditions we are having. You should already be scouting for buildup of aphids. Spider mites should be added to your list because they can attack many different vegetables: beans, eggplant, tomatoes, peppers, sweet corn, vine crops and also several weed species. They are being reported on various crops in New York State. Spider mites pierce and extract sap from the undersides of leaves and fruit.

Mites are slightly smaller than the size of a pinhead and maybe various shades of green, yellow or pink. They are visible as specks on the undersides of leaves. A 10X hand lens helps in identification. Two-spotted spider mite, one of the more common species found in this region, has two prominent dark spots on its back. Quickly scan plants for any yellowish or bronze foliage where the discoloration is usually in between the veins of the leaf. Leaves may be blotched with pale yellow or reddish brown spots ranging from small to large areas on both upper and lower leaf surfaces. If infestation is severe, leaves become pale and sickly in appearance, gradually die, and drop off the plant. Feeding on fruit may be identified by brown or whitish discoloration, webbing, or a roughened appearance on the surface.

Look for mites on the underside of these leaves and in sheltered areas on the plant. Adults, nymphs or eggs may be present. Under hot, dry conditions, eggs hatch in just 3 days. Immatures molt three times and reach adulthood in less than a week. When the population of mites on a plant gets high they form webs and the wind helps them to migrate to other plants. They will be more of a problem in irrigated fields that are near un-irrigated field crops, cover crops or weedy fields. The first outbreak of mites in a field often occurs around barns, fences, trees, or some obstacle in the field acting as a windbreak. A good indicator of spider mite buildup is often the presence of

bleached out looking nightshade plants at field margins and waste areas.

The key in preventing mite buildups is early detection and good spray coverage on the underside of leaves. The recommended threshold for peppers is when 10% or more leaves are infested. Initial infestations can be spot treated which should slow down mite population growth. Because eggs can hatch in just three days and available chemicals don't injure the eggs a second application should be made 5 days later.

*Adapted from Lake Plains PestMinder , NYS–
August 1, 2001 and IPM Pepper Manual*

TOM-CAST MODEL: LEAF WETNESS HOURS AND TEMPERATURE >>> DAILY DSV					
AVG. TEMP DURING WETNESS PERIOD (°F)	NUMBER OF HOURS OF LEAF WETNESS/DAY				
<55	0-24				
55 - 63.9	0-6	7-15	16-20	21+	--
64 - 68.9	0-3	4-8	9-15	16-22	23+
69 - 77.9	0-2	3-5	6-12	13-20	21+
78 - 85	0-3	4-8	9-15	16-22	23+
>85	0-24				
DAILY DISEASE SEVERITY VALUE (DSV)	0	1	2	3	4

TOMATO

Blotchy ripening and **graywall** have become problems on some crops. Blotchy ripening gets its name because the fruit ripen unevenly, with patches that don't ripen or do so after the rest of the fruit are over-ripe. Graywall is aptly named because they walls or skin of the tomatoes appear somewhat gray in color. There is also a dark brown necrosis in the wall of the tomatoes which is apparent when cut. These two disorders are believed to same, but with different symptoms. There are varietal differences in susceptibility and the way the symptoms appear. On some varieties the symptoms appear as graywall, while on others they appear as blotchy ripening.

The exact cause of these problems is not known, but environmental factors and perhaps disease may trigger the symptoms. Anything that suddenly stops or slows plant growth may induce this problem. This can be an excess or lack of moisture, low or hot temperatures, a period of cloudiness, or a nutrient problem such as insufficient nitrogen or potassium.

Tobacco mosaic virus (TMV) may also trigger these symptoms. Typically the symptoms appear about two or three weeks after the event.

Fungicide scheduling for early blight: Cool nights last week resulted in low DSV values. This week, nighttime leaf wetness

periods of 13-15 hours with temperatures above 70 have resulted in DSV ratings of 2 or 3 per day. High temperatures during a long leaf wetness period favor development of this disease and produce high DSV ratings (see table, page 3). Fungicides are recommended every time the accumulated DSV's since the last spray reach 15. At the rate of 2-3 DSV's per day, this means weekly sprays. If we return to cooler nights, schedules can be extended. Rotate systemic fungicides with broad spectrum materials (eg, Bravo with Quadris) to avoid resistance development in systemic materials.

DSV VALUES, JULY 25-AUG 8, 2001 SOUTH DEERFIELD RESEARCH FARM

Date	DSV's/Day	Date	DSV's/Day
Jul 25	2	Aug 2	1
Jul 26	0	Aug 3	0
Jul 27	1	Aug 4	3
Jul 28	0	Aug 5	2
Jul 29	1	Aug 6	2
Jul -30	1	Aug 7	3
Jul 31	1	Aug 8	2
Aug 1	1	Total for past 15 days	20 DSV's

--R Hazzard, J Howell, S. DeGray, J. Bergman

CRUCIFERS

Watch for **cabbage root maggot** eggs on root crops such as fall turnips and daikon, and highly susceptible succession-planted crops such as Chinese cabbage or Nappa. Third generation flight is likely beginning. Scout for the tiny white eggs at the base of stems or in the soil close to the stem.

Temperatures above 100 oF will kill the eggs. While we certainly have temperatures this high and higher this week in most fields, frequent irrigation will bring soil temperature down and create a favorable habitat for survival.

CUCURBITS

Watch for **powdery mildew**, which has been reported in more fields this week. It is a bit late this year, not surprising given dry conditions. In many cases this was the first occurrence in the field. See previous messages for scouting and spray recommendations. Also watch for **aphids (melon aphid or green peach aphid)**. Threshold is >20% of leaves with 10 or more aphids per leaf, based on sampling 10 groups of 5 leaves throughout the field.

A new product labeled for aphids in vine crops as well as fruiting vegetables is Fulfill (pymetozine). Fulfill was already labeled for potatoes and tobacco. EPA granted “reduced risk” status to the active ingredient, which affects the nerves that control feeding, especially for aphids, whiteflies and other sucking insects. The greatest efficacy is against aphids. Feeding and plant damage stop shortly after insects come in contact with the material, although aphids may be visible on the plants for several days. Fulfill has translaminar and systemic activity, enters leaf tissue and remains present in the leaf for up to two weeks. Restricted entry interval is 12 hours, with a 14-day preharvest interval. Impact on beneficial insects is low, thus this material will not cause secondary outbreaks of other pests which are suppressed by natural enemies, and will conserve aphid predators. Can be used during pollination, but do not apply directly to bees foraging in the field.

Pumpkin and winter squash **fruit development** is excellent in many fields. However, when night temperatures about above 65 oF, new female flowers may shrivel and die without setting fruits. This occurred in the earlier heat wave and is likely to occur again this week. Howden pumpkin is particularly susceptible, but other varieties can get it as well. Dale Riggs reports seeing this in pumpkin fields in NY, CT, VT and MA this week.

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.

SWEET CORN

European corn borer second-generation captures surged this week, which not surprising given high day and night temperatures. Scout pre-tassel stage corn for newly hatched borer larvae, which will feed in the protected tassel before emergence and will move into ears later. New hatch is likely in the next week, so infestation numbers will begin to rise again. Currently infestations are very low. Eggs will also be laid in silking corn, typically in the ear zone. Borers which hatch near ears typically enter ears through the tip. Weekly sprays with good silk coverage will prevent this damage.

Corn earworm numbers crept up this week, but are still remarkably low. Movement of air masses up the coast from the south has been minimal. This could change at any time. It's a great time to have your own trap to watch for sudden changes. Growers who have been paying attention to trap counts have saved a lot of sprays this season. It would be easy to doubt any particular trap counts if the numbers weren't so consistent throughout the state! There are some variations within regions, from 0-4 moths per week in most areas of the state, and 2-12 moths per week in the Southeast. Tighten your spray schedule to 6,5, or 4 days depending on corn earworm activity.

Corn leaf aphid is active in tassels. As ears develop, high numbers of aphids may result in infestations between layers of the husks or buildup of honeydew and sooty mold on husks. Unfortunately the options for aphid control are limited. Labeled products include Lannate (Odh), Warrior (1 DH), Asana (1DH) all of which also control caterpillar pests. Efficacy requires direct contact of spray on aphids, which can be difficult since aphids feed protected areas inside the tassel before emergence. The threshold recommended in NYS is to spray if 50% of plants have more than 50 aphids per tassel. Conservation of predators and parasites –which are numerous in corn – can be a cost-effective tactic and is easier to accomplish now that highly effective “softer” materials such as Spintor are available that provide excellent ECB control. With corn earworm numbers still low throughout the state, this may be a good choice if aphid numbers are moderate.

Fall armyworm numbers were low. **Armyworm** pheromone traps remain empty, and reports from around the state indicate no upsurge of activity from the second generation.

SWEET CORN TRAP CAPTURES AND SCOUTING DATA AUGUST 3-9

Town	Date	ECB Z1	ECB E2	TOTAL ECB	CEW	% PT
Berkshire Region						
N. Bennington, VT	August 2	1	0	1	0	--
Stephentown, MA	August 6	6	0	6	2	--
Sheffield	August 6	1	0	1	2	--
Conn. River Valley North to South						
Dummerston, VT	August 6	38	20	58	0	2%
Westminster, VT	August 8	0	140	140	0	0%
Plainfield, NH	August 8	3	0	3	0	0%
Hatfield	August 6	7	9	16	0	0%
South Deerfield	August 9	3	22	25	4	--
Whately *	August 7	4	16	20	0	--
Hadley	August 7	24	6	30	1	--
Amherst	August 8	21	3	24	0	0%
Southwick	August 7	11	63	74	2	--
Feeding Hills	August 6	0	4	4	0	0%
Cromwell, CT	August 8	0	0	0	0	0
East/Central MA, North to South						
Ipswich	August 7	9	12	21	0	0%
Dracut	August 8	4	73+	77+	2	--
Stow	August 7	1	20	21	2	2%
Bolton	August 8	7	18	25	1	--
Sutton	August 8	0	1	1	4	--
Monson	August 8	0	7	7	0	0%
Still River	August 9	0	0	0	0	0%
Leicester	August 8	0	4	4	0	0%
Millis	August 8	2	20	22	1	--
Hopkinton	August 8	6	29	35	1	4%
Seekonk	August 8	3	24	27	7	--
Swansea	August 8	7	36	43	4	--
Rochester	August 6	1	25	26	8	--
Rehobeth	August 8	2	28	30	12	--
Little Compton, RI	August 7	6	27	33	2	5%

* Next to Pepper field.

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.

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