

Vegetable IPM Message

July 27, 2000

Volume 11, Number 11

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Crop Conditions

Temperatures remain unusually cool for July, with nights in the fifties and daytime highs in the eighties. Lettuce, greens, cabbage, broccoli, summer squash, scallions, peas (in July!), and beans are producing well. Corn and tomatoes are ripening late. Bare-ground corn is finally coming in. Corn has good quality and is in high demand. Tomatoes are showing color, with the first report of ripe field tomatoes from crops grown on plastic and covered earlier with floating row cover. Potato crop is sizing up very well and yield will likely be excellent, except where leafhopper was not controlled. Peppers are reported to have good fruit set, but eggplants are struggling. Many pre-sidedress nitrate tests are indicating low levels of nitrate in the soil (less than 20 ppm nitrate-N), not surprising given the frequent rain and cool temperatures.

Peppers

Watch for new **European corn borer** flight and begin foliar controls on fruit one week after weekly captures reach 7 moths per week. The second flight is starting late and is below threshold in most areas (see sweet corn table).

TOMATO

Watch for early blight, late blight and bacterial diseases (see last week for descriptions) and maintain a regular spray schedule. We do not have specific TOM-CAST recommendations this year so growers need to depend on local assessments of leaf wetness period and night temperatures. Late blight has not been reported in Massachusetts, but has been found in Albany, NY on commercial tomatoes, western PA on home garden tomatoes and commercial potatoes, and in Michigan on commercial potatoes. Fungicides such as Quadris, Bravo, and mancozeb should be rotated for blight control, and copper can be added to help reduce the spread of bacterial diseases. Start with Bravo or mancozeb plus copper and save Quadris (a curative) for times when you are not able to get your spray on before rain or irrigation. Organic growers can use copper (Kocide) or a new product, Oxidate (labeled as Zero-Tol for ornamentals). This is 27% hydrogen dioxide and is registered for use as a bactericide/fungicide. The re-entry and

pre-harvest intervals are 0 hours. For more information contact BioSafe Systems (888-273-3088, www.biosafesystems.com)

--using information from *Lake Plains Region Pestminder (Cornell)* and *V. Grubinger (UVM)*

Crucifers

Watch for **cabbage loopers**, which showed up in low numbers along with other caterpillars this week in some scouted fields. These can be distinguished by their inchworm-like "looping" habit, which is evident even in small larvae. Damage occurs first on undersides of leaves, with tiny fresh chewing holes.

Confirm 2F (Rhom and Haas) is a relatively new insecticide registered for caterpillar control on a broad list of cole crops and leafy vegetables, as well as for fruiting vegetables, nuts and pome fruits. The active ingredient is tebufenozide, an insect growth regulator which interferes with the insect molting process. After ingestion, feeding stops within a day, and a premature lethal molt occurs. Residual activity is relatively long -- 14 days. The product was registered by EPA under the "reduced risk" category. It is not harmful to beneficial insects, has a restricted entry interval of 4 hours, and a 7 day preharvest interval in cole crops and leafy greens. A water-dispersible, nonionic spreader-sticker is recommended with use.

POTATO

New **Colorado potato beetle** adults are emerging in higher numbers this week. These adults may cause significant damage if larval control was poor in the first generation and if plants need more time for tuber sizing. To reduce resistance development, do not use imidacloprid where this material was used in the first generation. **Leafhoppers** continue to be active and scouting should continue. Since most growers scout by looking at leaves rather than using a sweep net, we use a threshold based on insects per leaf: one nymph or adult per 10 leaves. Both adults and nymphs cause damage. Many materials registered for Colorado potato beetle adults will control leafhopper (*See New England Vegetable Management Guide*). Methomidophos (Monitor) may be the material of choice because it has the advantage of systemic activity, long residual period, and effectiveness against aphids as well as leafhoppers. Organic potato growers are faced with a complete lack of effective, approved control materials for leafhopper and are seeing early crop senescence from hopperburn.

CUCURBITS

Phytophthora capsicii was found in pumpkin and summer squash in Hadley. Wet soils and wet foliage favor an outbreak of this disease, so it is quite possible it will show up in other fields. Look for soft rotted tissue anywhere on the plant, particularly the stem and crown near the soil surface or any fruit. Spread can occur with moving water in the soil, on any soil left on equipment used for tillage or harvest, or with windblown spores

moving through the air. Unfortunately there is no chemical control that will stop its spread. Phytophthora blight of cucurbits has been taken off the Ridomil label because of its lack of effectiveness under significant disease pressure. If an outbreak occurs, focus on limiting spread to new fields by washing with a strong water stream any equipment that moves out of the infected field. If the outbreak is in a small discrete part of the field, it may be useful to till under the infected patch to prevent airborne infections to other parts of the field, but be sure to clean equipment afterward.

--R Wick, R Hazzard, J. Lerner

DISEASE DIAGNOSTICS UPDATE

Bacterial and fungal leaf spots continue to plague a wide variety of crops this season. Many of these leaf spot pathogens are seed-borne, although they often require wet conditions in order to produce disease symptoms. Once the pathogen is introduced, it can remain on soil and plant debris and infect future crops. That's why it's so important to begin with clean, pathogen-free seed from a reliable source. Some commercial seed companies hot-water treat seeds, or will do so upon request. Growers can hot-water treat seeds from a wide variety of crops as well, including crucifers, cucurbits, carrot, lettuce, tomato. Always pre-test a small batch of the seeds to make sure that such treatment does not destroy seed viability. We have specific information about hot-water seed treatment here at the Diagnostic lab; feel free to call us (413-545-1045) and we'll send it out to you.

One bacterial disease that affects crucifers has made an appearance. Black rot (caused by the bacterium *Xanthomonas campestris* *pv.* *campestris*, and not to be confused with black rot of cucurbits caused by a different fungus), was found on kale. This can be a very destructive disease of crucifers, and all crucifers are susceptible. Symptoms appear first as yellow, V-shaped lesions at the leaf margins, with the base of the V directed along a vein. Control of black rot involves standard IPM management techniques. Exclude the bacterial pathogen by removal of cruciferous weeds, which can act as a host reservoir for the bacterium. Reduce bacterial inoculum by promptly plowing under of crop residue after harvest to speed decomposition of infected tissue. Rotate out of crucifers for three years. If the disease is present, copper applications (using a boom sprayer) may slow it down.

Other leaf spot diseases we've seen recently include bacterial leaf spot in basil, and leaf spot of parsnip, caused by the fungus *Cercospora*. Another seed-borne fungal pathogen that appears around this time of year is Fusarium. Fusarium causes wilt diseases in cucurbits and other crops, and since it is seed-borne, it very often shows up on one susceptible cultivar. As a result, you will often see one row of crops in a field affected by Fusarium wilt, while the other varieties are unaffected. Once it is introduced into the field, however, it can remain in soil for several years, so crop rotation away from that particular crop family is recommended.

We're seeing a lot of symptoms on cucurbit foliage, but many can be attributed to insect feeding, nutritional deficiencies, and mechanical or chemical damage rather than

pathogens. Very often, it's difficult to tell the difference, so if you see anything suspicious, submit samples to the Plant Disease Diagnostic Lab, Fernald Hall, University of Massachusetts, Amherst, MA 01003.

-Jeff Lerner, Rob Wick, Brian Lipke

Thanks to contributors

We are receiving information from many sources, including farmers and consultants in Massachusetts. I would like to acknowledge those who have sent in reports which are used in this and other newsletters: Ken Nicewicz, Dan Kaplan, Dave Dumaresq, Chris Clegg, Eileen Atmore-Droescher, Samuel Smith. Sweet corn data is reported by Paul Willard, Mike Yates, Jim Mussoni, Dale Riggs, Rolf Parker, Ray Pestle, Pam Westgate, and Roz Cook. Many thanks!

SWEET CORN

Corn earworm pressure is moderate, with captures between 2 and 10 moths/week in many areas of western and central Massachusetts and Vermont (5-6 day spray schedule). Higher activity is evident at some sites near the coast (Ipswich, Seekonk, Swansea) and, surprisingly, in the Berkshires at Sheffield (4-day schedule). It's great to have your own trap to watch for new captures (such as possible new flight after the current storm) and local variations. **European corn borer** second generation flight is late this year -- not a surprise given the cool temperatures. We are beginning to capture new moths but numbers are still very low. The exception is the univoltine strain on near New York border and emerging flight in Stow, Seekonk, Rehobeth. Pretassel infestations are low -- below threshold.

Foliar diseases are rarely a problem in sweet corn. This year, an unusual type of rust for the northeast, southern corn rust, is being reported on corn in Michigan and New York. It could reduce yields and affect sales of sweet corn by damaging the appearance of husks. Development and spread of common rust is favored by cool temperatures (61-73 degrees F) and high relative humidity (100%). Rust pustules are usually most abundant on the leaves, occurring simultaneously on both leaf surfaces. They are light-brown and become dark brown as the plant matures. If leaves become covered with pustules, chlorosis and death may occur. Scouting should begin as soon as pustules are detected. Sample 120 plants per field. Record the number of leaves with any rust pustules and count the number of leaves on each plant. Spray when 80 % of the leaves are infected. Once you reach the threshold, spray the plants every 7-10 days. It is important to try and keep rust from infecting ears of fresh market sweet corn because it may make the corn unmarketable. For best results, fungicide applications should be made prior to tassel. Fungicides recommended for control of rust include: Maneb, Manex, Dithane NT, Tilt, and Bravo Ultrex. Tilt and Bravo have a 14-day harvest interval and others have a 7-day harvest interval. This threshold is not valid for highly susceptible varieties. (NYS, Cornell)

SWEET CORN TRAP CAPTURES FOR WEEK ENDING JULY 27, 2000

Town	Date	ECB Z1	ECB E2	TOTAL ECB	CEW	FAW	% ECB PT**
Berkshire Region							
N. Bennington, Vt (NY/MA border)	26-Jul	15	0	15	3	--	
Stephentown	24-Jul	58	0	58	4	--	
Sheffield	25-Jul	1	0	1	28	--	
Conn. River Valley North to South							
Walpole, NH	26-Jul	0	0	0	2	0	5-9%
Plainfield, NH	26-Jul	0	1	1	2	0	5%
Westminster, VT	26-Jul	0	1		6	3	
Putney, VT	26-Jul	1	0		3	0	
South Deerfield	27-Jul	0	1	1	8	--	
Whately	24-Jul	--	--	--	0	--	
Sunderland	22-Jul	1	2	3	5	0	4
Amherst	25-Jul	0	3	3	5	0	12%
Hadley	22-Jul	0	0	0	5	1	10%
Feeding Hills	22-Jul	0	0	0	6	0	8%
East/Central MA North to South							
Haverill	24-Jul	0	0	0	6	0	6%
Ipswich	24-Jul	0	0	0	22	1	8%

Dracut	26-Jul			0	2	0	--
Stow	25-Jul	3	14	17	7	0	0%
Northbridge	26-Jul	2	0	2	5	0	3%
Munson	26-Jul	1	0	1	5	0	8%
Harvard/Still River	26-Jul	--	--	--	4	--	
Leicester	26-Jul	0	0	0	5	0	4%
Millis	26-Jul	0	0	0	9	0	--
Hopkinton	26-Jul	2	1	3	8	2	--
Seekonk	27-Jul	1	25	26	25	8	--
Rehoboth	27-Jul	2	32	34	8	3	--
Swansea	27-Jul	3	0	0	22	3	--

**** % infestation with European corn borer in unsprayed, pretassel corn.**

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.

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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