UMASS EXTENSION

VEGETABLE IPM MESSAGE

JUNE 13, 2002 VOLUME 13, NUMBER 7

CROP CONDITIONS

Crop growth has been slowed by cool temperatures and frequent rains. Light soils have not bogged down, but some growers are having difficulty getting into wet fields. For the week ending June 10, temperatures in Mass averaged 4-6 degrees below normal and rainfall ranged from 2-2.7 inches (NEASS Crop Weather Vol. 22 No 7). Rainfall for the previous four weeks was 6-9 inches around the state, which was 3-4.5 inches above normal rainfall for that period. We are pretty much caught up, in terms of soil moisture and surface water sources. The Amherst College Weather Station reports the total rainfall from March, April and May at 13 inches, which is 1.4 inches above the 53-year norm. This is an independent weather station which has been monitored by Virginia White for the past 53 years. **Note the graph of spring temperatures on page 6.**

Harvest now includes rhubarb, asparagus, strawberries, lettuce, greens, radishes and baby turnips. Most warm-weather crops are in the ground and well established. Pumpkins and winter squash are still being planted. Succession plantings of greens, corn, crucifers, summer squash and beans continue. Labor Day corn is going in this week or next week. The very earliest corn started under plastic is in silk (at 2-3 feet tall). Early season beetles (flea beetles, cucumber beetles, Colorado potato beetles) are up and running, but moth activity has slowed a bit with the cool nights. Weeds are doing very well thank you. Early tomatoes are being staked. Wet soils favor root disease problems (eg Pythium); some fields have required replanting due to loss of the crop. Maggot damage (cabbage, onion or seed corn maggot) can further aggravate the impact of wet, cool conditions – and vice versa.

COLORADO POTATO BEETLE LARVAE JUST AFTER HATCH

POTATO: BE READY FOR COLORADO POTATO BEETLE EGG HATCH

Colorado potato beetles (CPB) are moving into potato fields and laying eggs. Walk your fields and look for CPB adults and eggs. Except for field edges in non-rotated fields, adult beetles do not usually cause enough damage to early potatoes to require control. The economic threshold for adult beetles in potato is 1 beetle per 2 plants (or per 2 stalks, in midseason).

Scouting. Look on the undersides of leaves for the orange-yellow egg masses. The fresher the eggs, the brighter orange the eggs will appear. If eggs have been around for a while, they appear more orangish then turn a dark brown just before they hatch. When you find eggs, flag ten egg masses with bright tape or flags, and then keep an eye on the hatch. This will tell you when the earliest eggs are hatching.

Timing and thresholds. If you are using Bt's, you want to apply the Bt when 20-30% of the eggs have hatched. If you are using spinosad (Spintor 2SC) or a broad-spectrum insecticide, you can wait till more larvae are hatched, until the oldest larvae reach the beginning of the fourth stage, when they are about 1/3 inch long. Applications made at this time with Spintor, Provado, AgriMek, or synthetic pyrethroids will kill all the larvae that have hatched up to this point. The threshold for small larvae is 4 per plant; for large larvae, 1.5 per plant (or per stalk in midseason), based on a count of 50 plants or stalks.

With cool conditions, beetle invasion of fields, egg deposition and then hatch can be spread out over a long period of time. This situation is not good as then you can have various stages of larvae as well as adults in your field. Or, if it warms up suddenly, you will have a rapid flush of larval hatch and feeding damage that may seem to explode out of nowhere. Hatched larvae go through four stages before they become adults. In the first stage, the larvae are about the same size as the eggs and second stage, they are about an eighth of an inch long. As the larvae get bigger, they do more feeding. The fourth, or largest, stage does 85% of the feeding damage.

Colorado potato beetles rapidly develop resistance to insecticides. This happens on a field by field basis, which means that **you** have control over how resistant **"your"** beetles become to any given product. Management strategies for CPB should use crop rotation and alternate classes of insecticides in each generation of the beetle. In the summer of 2000, beetle eggs were collected from 26 Connecticut Valley potato fields by Mitch Baker at UMass. Larvae were treated with a range of concentrations of imidacloprid to groups of larvae to find out how susceptible they were to Admire. He found that there was a **25-fold range in resistance**, that is, it took 25 times as much Admire/Provado to kill the larvae from the most resistant field compared to those from the least resistant field. There was wide variation among even neighboring fields, suggesting that the treatments that each individual field receives makes a difference in how much resistance develops.

To prevent resistance, alternate among classes of insecticides in each generation, and throughout the season. If you used Admire at planting, *do not* use foliar applications of Provado. Alternate applications of Asana, Pounce, Baythroid or Ambush with Provado, or with Spintor, or with a Bt. One strategy would be to use spinosad which controls adults and all larval stages for the first spray, followed by a Bt to kill emerging young larvae.

Spinosad (SpinTor 2SC) gives excellent control of all stages of CPB at the 3.5 to 4.5 fl oz rate. For a heavy population, two applications about 10 days apart, with the initial application when third instars occurs, will control the first generation. Spintor has the advantage that it will control adult CPB and also European corn borer if a grower has that pest on early potatoes.

Abamectin (AgriMek 0.15EC) is mainly a contact material which controls larvae. It may be best used early in the season, when good coverage is easier to obtain. Rates of 5-6 fl oz rate per acre gave effective control in commercial fields in trials on Long Island. The lowest labeled rate is 8 fl oz.

Bt tenbrionis (M-Trak, Novodor, Beetle Beater) or ***Bt tenebrionis/kurstaki*** (Raven), controls small larvae, through the third instar. Time applications to begin when 30 percent of the eggs have hatched. Where fields are densely populated and eggs are hatching continuously, reapply every 5 to 7 days. According to our most recent information, Novodor, M-Trak and Beetle Beater are approved in Mass. for organic producers, for the current season. Check with the NOFA-MASS organic certification program (978-297-3644) for more details.

Bury cull piles. It looks like we are beginning to have a perfect late blight kind of year. Cool, wet conditions favor late blight (LB). With that in mind, before things get too busy, it's a good idea to check your potato cull piles. Cull piles are a good source of LB. It can be carried over from the previous year or unsprayed potato plants will be more susceptible. Bury the pile with at least 2 feet of soil or cover with a black plastic tarp.

Potato Leafhoppers normally begin to appear in fields around the middle of June. Often leafhoppers cause serious damage before the grower knows they are present. Leaf bronzing or 'hopperburn,' can cause serious reduction in yields. Look for the greenish adults under leaves. Adults quickly fly off when disturbed. Later, the light green or tan nymphs are easier to detect. Leafhoppers can be monitored using a sweep net or by searching the underside of the leaves. With a sweet net, make 5 sweeps across a row at five locations in the field. Control is suggested on potatoes if there is more than one leafhopper per sweep or 5 nymphs per 50 leaves. If you don't have a sweep net, search under leaves and note adults or nymphs. If you find an average of 1 per 10 leaves, control is recommended. A third method is to flop the vines into the row and shake the plant vigorously. Look on the ground for leafhoppers that fall off the plant. Check the N*ew England Vegetable Management Guide* for recommended products.

- adapted by R Hazzard from J. Mishanec and M. Baker

WEB SOURCE FOR DISEASE IDENTIFICATION

An excellent new web resource for disease identification is the New York State's **Vegetable MD Online.** This is a site produced by the Plant Pathology Department at Cornell. It has great pictures. You can go through a selected crop and learn about any disease that might affect that crop. Did I mention it has great pictures? Check it out. The web location is:

http://VegetableMDOnline.ppath.cornell.edu/Home.htm

-- John Mishanec, IPM Vegetable Program

SEEDCORN MAGGOT INFESTATIONS: WHAT TO DO?

This spring, growers have reported seedcorn maggot in many vegetable plantings. Cool, wet weather is ideal for seedcorn maggot growth and development. Bean, corn and vine crop fields are most commonly attacked, although the seedcorn maggot has a fairly wide host range. The adults, small gray flies that look like houseflies, are attracted to soils rich in organic matter for egg laying. Applying manure to soils or plowing down green manure increases the attractiveness of soil for several weeks. Growers should delay planting into such soils. Once a field has been infested with seedcorn maggots, there is no remedy but to replant. Insecticides cannot salvage fields already infested. If a grower chooses to replant, there are several ways to prevent damage to the second planting. The best solution is to delay replanting until the maggots have matured and the soil has warmed. Mature maggots are about a quarter of an inch long. If a grower finds maggots this size in the field and waits about a week to replant, it should be okay. If maggots are smaller, growers should wait about one and a half to two weeks to replant. Planting into soils where maggots are present is risky. Insecticide-treated seed can help as can some soil applications of insecticides where allowed, but the best strategy is to wait. Once the soils warm to around 70° F, there is little danger of damage from seedcorn maggot.

From B. Bishop & W.Pett, Michigan State

TWILIGHT MEETING IN CENTRAL VERMONT, TUESDAY JUNE 18

On Tuesday June 18, from 5 to 7 PM Tim and Janet Taylor at Crossroad Farm in Fairlee, VT will host a twilight meeting. Tim and Janet Taylor operate a diversified vegetable, berry and ornamental farm with 13 greenhouses and high tunnels and 50 acres in cultivation. Dairy manure is the primary source of soil fertility in the fields, and the many weeds that result are managed without herbicides. Tim will demonstrate cultivation equipment he uses, including: a Perfecta field cultivator, Lely tine weeder, Buddingh baskets, 'bat-wing' shovels, Lilliston rolling cultivators and his latest tool, a Reigi weeder, which has PTO-driven rotating mechanical fingers that are steered by an operator. For more information contact Vern Grubinger at 802-257-7967.

Directions: Take Exit 14 off I-91 (Thetford, north of White River Junction), turn west onto Route 113 and go about 7 miles. North of Post Mills look for the state sign saying Crossroad Farm. Turn right, the farm is a half mile on the right. From the northwest, take the Exit 5 (Northfield) off I-89 onto Route 64 east into Williamstown. Turn right onto Route 14 south. Just past the village turn left onto Williamstown Rd.

Take that over the hill to Route 110, turn right go to Chelsea, then turn left onto Route 113 east. After West Fairlee turn left on Crossroad, the farm is about a half mile on the right.

-Vern Grubinger, UVM

MASSACHUSETTS FLOWER GROWERS SUMMER FIELD DAY

On Tuesday, July 30, 2002 1 to 7 PM the University of Massachusetts Extension and the Massachusetts Flower Growers' Association will co-sponsor the Massachusetts Flower Growers Summer Field Day on the beautiful grounds at Elm Bank Reservation, Dover MA. Our educational program features Rick Schoellhorn, University of Florida on "Practical Guidelines for Managing Plant Height of Spring Crops in Massachusetts"; Delilah Onofrey, of *Greenhouse Grower Magazine & America in Bloom;* and Tom Mahoney, of Mahoney's Garden Center, on the "How to Become Involved in the America in Bloom" program, a Grower Panel – "What we plan to change in our business over the next 10 years" and UMass Extension on "Reviewing the Spring Growing Season".

A trade show under the tents, tour of the bedding plant trial gardens, delicious lobster/clambake/chicken dinner and the MFGA benefit raffle will complete the day.

Please pre-register by contacting Tina Smith at 413-545-5306 or Paul Lopes at 508-295-2212 ext. 24, University of Massachusettsor Bob Luczai of Massachusetts Flower Growers' Association at 978-952-0116 or visit our websites www.umass.edu/umext/floriculture & www.massflowergrowers.com.

Tina Smith, UMass Extension Educator, Floriculture.

PRE-SIDEDRESS NITRATE TEST: NOW IS THE TIME FOR SAMPLING

Many crops have reached or will soon reach the stage when it's time to decide whether, and how much nitrogen to apply as a side dress or top dress. You may be wondering how much nitrogen has been leached by the heavy rains of recent weeks. The pre-sidedress nitrate test (PSNT) (also known as the June Nitrate Test) can help you to determine the current level of nitrogen in the soil. If you have a soil probe, the sampling takes about 20 minutes per field. (Probes are available from many ag suppliers for $40 to $75.) The amount of nitrate-N (reported as parts per million $N0_3$-N) in the soil is a good indicator of whether more N will be needed to complete crop growth.

To take a sample for nitrate testing, take 15 to 20 subsamples or cores from the field. Sample slices or cores should be taken to a depth of twelve inches if possible. Avoid sampling fertilizer bands or other areas which have high concentrations of N fertilizer. Generally the best place to sample is between the rows. If plastic mulch is used, samples should be taken from under the plastic. With a soil probe you can just sample through the plastic, leaving small holes which cause no problem. Be sure to avoid any trickle irrigation tape under the plastic. Mix all the samples together and submit about one cupful to the **UMass Soil Testing Lab, West Experiment Station, University of Massachusetts, Amherst MA 01003.**

Cloth bags are available for sending PSNT samples to the Soil Testing Laboratory. These bags are more convenient to use because it is not necessary to dry the samples, as long as the laboratory receives them within four days. With other bags you should dry the samples unless you can deliver them within 24 hours. The lab will do the PSNT within one working day of receipt and inform you of the results. There is no charge for the bags, but you must send payment along with the samples. The charge for this test is $6.00 (include a check made out to the University of Massachusetts). Be sure to request a Nitrate (PSNT) test. To obtain bags, contact either Frank Mangan at (978)422-6374, John Howell at 413-259-1203, or Steve Bodine at 413- 545-2311 (FAX 545-1931). Frank Mangan and John Howell are available to consult with growers about the test results.

The PSNT is a tool growers can use to optimize N application. Research conducted for several years at UMass, along with several years of on-farm experience, indicates that an appropriate threshold for peppers and winter squash is about 30 ppm nitrate-N. Above this level, sidedressing or

topdressing supplemental N would be of no value and will likely decrease yield of butternut squash and peppers. Research in Connecticut has shown similar results in pumpkins. There is increasing agreement that a threshold of 30 ppm is appropriate for most vegetables except for sweet corn, for which the threshold is 25 ppm. Using the PSNT can save money and time, improve crop yield, and reduce the likelihood of N leaching and water contamination. Barring unusual weather conditions, PSNT levels in a field tend to be fairly consistent from year to year. Once these values are known for a field, a grower probably does not need to test every year. As a tool, the PSNT should be used along with a grower's experience and knowledge of fields. Interpretation of PSNT results should be made with regard to weather conditions such as leaching rains or soil temperatures.

--John Howell, Frank Mangan & Ruth Hazzard

TOMATO

Cat-facing on early tomatoes may be a problem this year, as a result of cold temperatures during flower formation in May. Nothing can be done by the time you see symptoms except to hope that the next cluster was not subject to such extreme cold.

In greenhouse tomatoes, watch for **Botrytis**. Cool, dark days favor the development of this disease. Botrytis blight produces characteristic gray fuzzy appearing spores on the surface of infected leaves or fruit. Air currents and splashing water can easily spread the spores. Control of the environment is very important in controlling this disease. Keep humidity below 93% by heating and ventilating. Avoid wetting the foliage during times when drying is slow. If using fungicides (eg, Exotherm Termil or Maneb 75 DF), observe restricted reentry intervals. TopShield, *Trichderma harzianum*, is a beneficial fungus which can suppress Botryitis if used as a preventative. It does not cure diseased plants and should not be used within a week of fungicide applications (since fungicides will kill it).

Early blight. We begin logging weather conditions and calculating Disease Severity Values for TOM-CAST on May 24. Most tomatoes were planted after that date. The risk of early blight development is based on temperature and leaf wetness period. Night temperatures must be above 55 F for this disease to develop, and higher temperatures favor the disease. To date, the accumulated DSV's have reached 20. Our recommended threshold for the first early blight fungicide is 35 DSV's. Watch future newsletters for more details.

Where **bacterial diseases** have been a problem on your farm, early applications of copper are recommended to prevent outbreaks later in the season. Recent wet, cool weather favors the development of bacterial diseases.

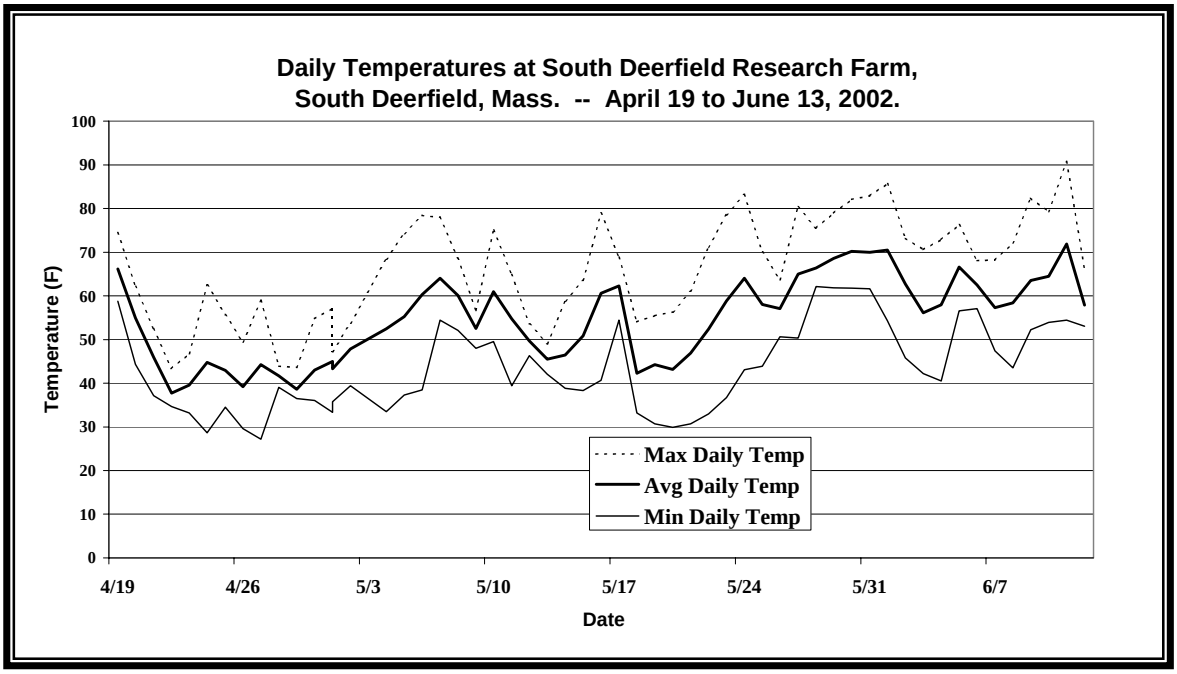
CRUCIFERS

Cabbage root maggots are showing up in plant roots in untreated fields of early brassicas, causing scattered wilt and death of plants. Rescue treatments are less effective than well-timed soil drenches based on the presence of eggs. New plantings should not need treatments for root maggot. **Diamondback moth** and **imported cabbageworm** have been observed, but at very low levels.

SWEET CORN

European corn borer flight counts are lower this week at most places. This is probably the result of cold night temperatures, which have been below 55 F most nights since June 1 (see graph of temperatures, below). Moths are not active below 55 F. Yesterday we began searching fields of early bare ground corn in the Connecticut Valley for ECB egg masses prior to releasing *Trichogramma* wasps, and came up with about 1 ECB egg mass per 50 plants. Not a high level of infestation – yet! No larvae were found. If nights warm up, we can expect a flush of egg laying and the beginning of hatching larvae. At that point, fields of early corn that are in silk will be subject to ECB larvae entering directly into the ears. Early corn that is under row cover can remain covered until tassels emerge and pollen is shed. This will protect the crop from ECB infestation until just before silk and will save some sprays.

Weekly Trap Captures of European Corn Borer in Sweet Corn				
TOWN	DATE	ECB Z1	ECB Z2	TOTAL ECB
		IOWA	NEW YORK	
N. Bennington,VT	June 12	4	2	6
Sheffield	June 12	0	3	3
Walpole, NH	June 11	4	3	7
Plainfield, NH	June 11	0	1	1
Westminster, VT	June 11	2	5	7
South Deerfield	June 13	11	21	32
Sunderland	June 12	23	59	82
Hadley #1	June 12	12	29	41
Hadley #2	June 12	18	38	56
Still River	June 12	0	9	9
Belchertown	June 12	4	16	20
Sharon	June 13	10	8	18



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