UMASS EXTENSION

VEGETABLE IPM MESSAGE

JUNE 6, 2002 VOLUME 13, NUMBER 6

CROP CONDITIONS

Warmer weather has encouraged good germination and establishment of cucurbits, tomatoes, peppers, and helped get other crops moving again. Temperatures were, on average, 5-8 degrees above normal last week all across Massachusetts, with daily highs near 80 degrees F and lows in the 60's. Whipping winds, local spots of hail, and heavy rains provided some more challenges this week. Drenching rain now covers the state, and it may take a few days to for fields to dry out. Despite the periods of cold we experienced in late May, cumulative growing degree days are higher than the long-term norm. Asparagus and rhubarb harvest continues, and the first lettuce was picked in the Connecticut Valley. Community Supported Agriculture (CSA) farms are getting ready for their first share distribution, and checking their list of what will be included: brassica greens, lettuce, scallions, radishes, and maybe strawberries, greenhouse tomatoes, broccoli….whatever survived and thrived in this embattled spring season.

CRUCIFERS

Flea beetles are busy. We have noticed a number of situations where row covers are not providing good control. In our trial last year, row covers provided perfect control as long as they were completely sealed along the edges. One of the challenges of row covers is to maintain that seal despite wind, rain, deer, dogs, weeding episodes, etc.

Here are some suggestions:

--The best seal is a solid line of soil along the edge of the cover. If you are sealing the cover with soil-filled black plastic bags placed at intervals along the edges, be sure to place them close enough that they provide a good enough seal to keep flea beetles out -- even when the wind is blowing!

--Many farms have new, less new, and older sets of row covers --, with progressively more tears each time the cover is used. Choose your best quality cover for flea beetle barrier. The beetles are small and persistent, and tears will allow entry.

--Be sure to put the cover on and seal the edges down AS SOON AS YOU SEED. Do not wait for the crop to emerge – beetles will find the first cotyledons. They are quite happy underneath the cover if you place it over them.

--When you remove the cover for weeding, replace it as soon as possible.

RETIREMENT PARTY FOR JOHN HOWELL

We invite you to join us in honoring John Howell's many years of service to the vegetable industry at a retirement party on Friday, June 14 at the Hickory Ridge Country Club located at 191 West Pomeroy Lane in Amherst. The event will start at 6:00 and the cost is $ 22 for dinner, which is a buffet with a choice of three entrees. A previous newsletter stated that the deadline for reservations was June 3; however, Hickory Ridge will accept reservations until approximately June 11. Please call Frank Mangan to reserve your place (978-422-6374). Checks (made out to Frank Mangan) may be sent to Frank Mangan, 59

Kendall Hill Rd, Sterling, Mass. 01564. Reservations are required.

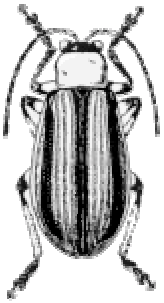
Directions to the Hickory Ridge Country Club:

From Mass Pike: East and West: Mass Pike to Exit 4 (Rte 91/ Holyoke). Follow to Exit 19 (Rte 9 East). Follow Rte 9 East for 3.5 miles and turn right on Mill Valley Rd. Follow 9/10 mile to intersection of South Maple Street and turn right. Follow 7/10 mile to Moody Bridge Rd, make left turn.

From Interstate 91: South: Take I91 to Exit 19 (Rte 9 East). Follow Rte 9 East for 3.5 miles and turn right on Mill Valley Rd. Follow 9/10 mile to intersection of South Maple Street and turn right. Follow 7/10 mile to Moody Bridge Rd, make left turn.

From Interstate 91: North: Take I91 to Exit 20 (King Street). At the lights take a left to Damon Road. Go to the end of Damon Road. Take a left at the Coolidge Bridge (Rte 9 East). Follow Rte 9 East for 3.5 miles and turn right on Mill Valley Rd. Follow 9/10 mile to intersection of South Maple Street and turn right. Follow 7/10 mile to Moody Bridge Rd, make left turn.

CUCURBITS: BE READY FOR STRIPED CUCUMBER BEETLE



Striped cucumber beetles are becoming active and numbers are likely to jump rapidly this week. We observed large numbers on zucchini in a non-rotated field. 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. Rotation makes a difference! Numbers will be higher and infestation earlier in non-rotated fields.

Scouting. 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. 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. This can be done in about 20 minutes. Check field edges for 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 or border trap crops may help reduce infestation of the whole field. See the *2002-2003 New England Vegetable Management Guide* for specific materials. (Don't have one? Call 413-545-2717 to order your copy).

Tips on using a transplant drench. If you are setting out transplants and want to apply Admire as a pre-transplant drench, one of the concerns is how to apply the correct amount. The goal is to apply 0.02 ml per plant. To treat a flat of 200 transplants with Admire at this rate, a grower would need to dilute 4 ml (0.135 oz) of Admire in a volume of water sufficient to soak to soil mix evenly.

One of the easiest ways to do this is with a siphon mixer. An example of this is the Hozon Brass Siphon Mixer (see photo below), which is readily available from many greenhouse and garden suppliers for $20-25 and which is designed for applying liquid fertilizers or pesticides to in the greenhouse. It consists of a brass fixture which attaches between the water spigot and the watering hose, a backflow preventer, and a rubber siphon hose that is placed in a bucket containing the desired chemical in solution. This device applies approximately 16 gallons of water for every gallon that is drawn up through the siphon. Make a test application of water to figure out how much water will be siphoned up when you are watering the desired number of transplants. Then mix the appropriate amount of Admire into that amount of water in the siphon bucket.

To get an accurate measurement of the small amount you need,

HOZON BRASS SIPHON MIXER

--Photo from Primary Products for Serious Gardeners (http://www.primaryproducts.com/)

you could make a visit to a local drugstore in the children's medicine section. For about $2.50, you can find a simple plastic syringe (e.g., 'EZY Dose Oral Syringe') that will measure increments as small as 0.2 ml.

To help make the calculations: multiply 0.02 ml per plant times the number of plants in your flat. For example, use 20 ml to treat 1000 transplants. If necessary, you can convert ml to oz by dividing by 29.6 (there are 29.6 ml in one fluid oz).

Treat at least 1 day prior to planting in the field. This allows time for the material to be drawn into the plant tissue.

Be careful of phytotoxicity (burning the plants) at higher rates. In Pennsylvania, burning of leaf margins was observed at 0.04 ml/melon plant at the 2-leaf stage, although these plants did grow out of this in about 2 weeks. The transplant treatment should be sufficient to carry the plants through the early crop stages. Scouting can determine if any foliar applications are needed at later stages.

Admire can also be used for Colorado potato beetle or flea beetle control on tomato, pepper and eggplant transplants. Again, be cautious not to use too high a rate to avoid crop injury. The suggested rate for tomato transplants is 15 ml - or 0.5 ounce - per 1000 transplants.

Tips on Using Surround WP. Many growers are using kaolin clay for the first time this season. This product is particularly important for growers using organic methods. Other organic options are row cover and rotenone. Here are some suggestions on using Surround:

- Apply before beetles arrive. This acts as a repellent and anti-feedent so must be present before damage is done.
- If you are using transplants, apply before setting them out. This saves time and materials.
- With direct-seeded crops, apply as soon as seedlings emerge if beetles are active.
- Ensure good coverage of the foliage (it will look like it was sprayed with white latex paint), including, if possible, the undersides of leaves (not easy when cotyledons are close to the ground).
- Reapply after a heavy rain
- Be sure to mix a slurry in a bucket and then add the slurry to the tank, as the dry powder could cake if added directly to the tank mix.
- Continuous agitation is needed.

WATER SAFETY ISSUES ON THE FARM

On your farm, you may use water for irrigation, applying pesticides and fertilizers, cooling and/or frost control. In packing operations, water is used to cool and wash produce, to clean and sanitize your plant, and to wash your hands. If the water you use is contaminated with **pathogens**, you run the risk of contaminating the food you grow and sell.

Water can be the source of a variety of pathogens including ***E. coli*** O157:H7, ***Salmonella spp.***, ***Shigella spp.***, ***Cryptosporidium parvum***, ***Giardia lamblia***, ***Cyclospora cayetanensis***, and the **Norwalk** and **hepatitis A viruses**. Contaminated water used for irrigation and washing produce has been linked to outbreaks of Salmonella, Giardia and Cyclospora.

Municipal or public water systems are the best source of water for any on-farm use and present the lowest risk of contamination. Public water supplies are monitored and treated for contaminants. Private wells that are tested annually and found to be safe are also unlikely to contaminate produce. Ground water is less likely to have microbial contaminants than surface water. Surface water (ponds and streams) is most likely to be affected by watershed activities and season and, therefore, present the greatest risk of contamination from harmful pathogens.

What can you do?:

1. Recognize the risks associated with your water source. The risk for contamination of your produce with water depends on a number of variables including: A. what you are growing (cantaloupe or lettuce may be more risky because they are grown close to the ground and may be difficult to clean); B. whether your crops are grown near the ground or on trees; C. your source of irrigation water; and D. the condition of your water supply system--well or public.

Take a look at the source of your water; consider possible sources of contamination, including animal pastures, manure storage facilities, feed lots, faulty septic systems and high concentrations of wildlife. Was your land always used for agriculture? What potential sources of contamination are in the watershed area--sewage treatment plants, chemical plants, livestock operations?

The Water Source Questionnaire, following this article, can be used to assess the risks associated with your farm's water system.

2. Test your water. Water testing can be useful tool, providing you with information about the quality and safety of your water supply. Contact your local or state health department for the names of laboratories licensed to test water.

Standard/conventional water tests will tell you if your water supply contains "fecal coliforms" or "generic" ***E.coli***, but **does not** tell you about the presence of pathogens (bacteria, viruses or parasites that can make you sick) like ***E. coli*** O157:H7. If you are concerned about possible contamination by specific bacteria or other pathogens, you should request that your water sample be tested for these.

It is recommended that:

If you use municipal water: Request records regarding their testing programs for your files, annually.

If you use well water: A. You test the well water 1-2 times per year.; B. To process your produce, you will need to test well water at least once per year to comply with processing regulations.; C. Note changes in your water quality, such as cloudiness after a storm may indicate that surface water is contaminating your well. Check your well construction and pump. Divert any surface water that pools away from the well head. Test the water again soon after a storm.

If using surface water for irrigation: Testing can be useful tool in determining your risk for contamination. Test surface water three times per year--at planting, at peak use and at or near harvest. A single test may not indicate the potential for water to be contaminated. If pathogens are present in low numbers, they may not show up in your test.

3. Keep records for all water tests. Record test results, review them regularly and note changes in water quality over time. In addition to water analysis test results, you should keep records of well construction details and dates, and maintenance records for the well and pump.

Adapted from the New England Extension Food Safety Consortium by Craig Hollingsworth

WATER SOURCE SELF-QUESTIONNAIRE

Answer "yes" or "no" to all of the questions that apply to your operation. For questions with a "yes" answer, pat yourself on the back for doing a good job. If you answered "no" to any of the questions, you should develop an action plan to reduce your risk. Use the information in this GAP education series and any of the resources listed below to help you develop your action plan.

1. Do you have a maintenance schedule for your wells?

If you use well water for spray irrigation, mixing pesticides, cooling fruit, or washing vegetables, is your well at least 100 feet from a:

2. Manure storage facility?
3. Livestock area?
4. Septic system drainage field?
5. Discharge area for milk house wastewater?
6. Is the drinkable water/well water sources tested at least once per year?
7. Are records of all water tests on file?
8. Have you installed a backflow prevention device or other system to prevent contamination of clean water supplies by potentially contaminated water?

If you use surface water for irrigation and pesticide application:

9. Do you used drip, under-tree or low volume spray irrigation to reduce water contact with fruit?
10. If you use overhead irrigation or evaporative cooling, do you test your irrigation water for fecal coliform concentrations during the growing season?

11. If livestock operations are located nearby the irrigation source, are animals excluded?

12. Are good management practices in place to protect the quality of irrigation water?

13. Do you use only potable water to apply foliar applications including pesticides, nutrients, and growth regulators?

In the barn or packing house:

14. Does water used to cool, clean and sanitize produce meet the EPA Drinking Water Standard?

Adapted from: G. Baird Wireman, D. Granatstein, E. Kirby, E. Adams, Washington State University Cooperative Extension and S. Ingham, University of Wisconsin-Madison, Reducing Food Safety Risks in Apples: A Self Assessment Workbook for Producers of Apples, Juice, and Cider. May 2001.

CHOOSING A COVER CROP

Cover crops can provide multiple valuable benefits to cropping systems. While typically used in the Northeast to protect the soil against winter erosion, or to add biologically-fixed nitrogen, other uses include improvement of overall soil quality, weed management, late-season nutrient capture and even enhancement of biological control agents in the system, such as beneficial organisms. A key to successful use of cover crops is to choose the appropriate species to fit the specific goals of their intended use in the cropping system. As such, a grower should first identify a primary goal or use for the cover crop, characterize the conditions under which it will be grown, then use this information to describe the ideal species before matching the description with the best available cover crop species.

Erosion Control: These species need to be able to quickly develop an extensive below - and above-ground biomass, often during cold and inhospitable weather in the fall. In general, cool-season small grains are the best options. Cereal rye (*Secale cereale*) is the best choice for most Northeastern cropping systems because of its ability to germinate and grow late in the fall when other species have effectively shut down growth for the year.

N-fixation: Legumes used as cover crops have a relationship with a bacteria in their roots that allows them to utilize N from the air and convert it to a plant nutrient. The plants can then be turned into the soil as a "green manure," thus enriching the soil with N for use by the following crop. Typically, legumes used for this purpose are winter annuals, occupying the niche between summer crops. Hairy vetch (*Vicia villosa*) is the most cold-tolerant of the winter annuals and so has been used frequently in Northeastern cropping systems. Growers who are willing to dedicate longer periods to the green manure crop have expanded options, such as Biennial Sweetclover (*Melitotus officianalis*) or the short-lived perennial Red Clover (*Trifolium pratense*).

Soil Improvement: Nearly any cover crop will bring about improvement of some soil biological, chemical or physical characteristics. Covers with lower N contents, such as grasses, may lead to longer-term buildup of stable soil organic matter, but legumes can also lead to improved soil conditions, particularly short-term improvement in soil aggregation and water infiltration.

Weed Control: The use of cover crops for weed management involves manipulation of several principles: competition for light, water and nutrients, physical smothering by residues and phytotoxic effects, or allelopathy. Any cover crop that grows vigorously at a time when weed species would otherwise be germinating and emerging can be used to out compete weeds. Those with thick and decay-resistant residue may be able to act as a mulch, which smother germinating seeds. Cool-season grains, particularly Cereal Rye, has been used successfully in the Northeast as a killed surface mulch in no-till vegetable systems for weed suppression. Generally, the grain can be killed by mowing and left in place once it has initiated flowering. Several cover crop species are noted for the release of chemicals during decomposition that may inhibit the germination of small-seed weeds in the surface soils. Cereal Rye has the most notable allelopathic effect, but many members of the Cabbage Family, such as Mustard, Forage Kale and Oilseed Radish have exhibited some effect in this regard. It should be noted that cover crops rarely offer acceptable weed control through allelopathic effects alone.

Selection of Cover Crops to Fit the Rotation: As noted above, most growers in the Northeast prefer to establish cover crops during the fall through spring period when the field is otherwise not utilized by economic crops. Winter annual cover

crops, including an array of grasses, legumes and brassicas, can be planted in the fall, but vary in their ability to overwinter in the Northeast. The most cold-tolerant winter annual species include Cereal Rye and Hairy Vetch, but several others, such as Crimson Clover (*T. incarnatum*), Winter Wheat (*Triticum aestivum*) and several forage-type brassicas will fairly consistently overwinter in Hardiness zones 6 and above.

Those who choose to keep the cover crop in the field through at least one year will find that Red Clover, White Clover (*T. repens*) and Biennial Sweetclover are all sufficiently hardy to withstand most winters in the Northeast. Other options for cover cropping include some non-traditional time periods, such as Summer Fallow, when heat-tolerant species such as Cowpeas (*Vigna unguiculata*), Buckwheat (*Fagopyron esculentum*), or Sudan Grass hybrids can be grown for weed control and soil improvement. In choosing an appropriate cover crop and its place in the rotation, the ability of the species to grow and survive in the crop environment at the time of seeding, the equipment available for seeding, the cover crop's ability to withstand field traffic, the cost of the seed, and the anticipated method for cover crop demise at the end of its functional life cycle, as well as a number of other things, must be taken into account.

-- Marianne Sarrantonio; University of Maine.

SWEET CORN

European corn borer numbers are on the rise. Most sites have reported captures in excess of 25 moths per week with the E (New York) strain at higher numbers than the Z (Iowa) strain. Typically the E (New York) strain emerges first, before the Z strain. IN warmer areas, early corn that was started under plastic is approaching the pretassel stage (tassels beginning to poke up) and should be scouted for European corn borer larvae. Moths have been active for at least two weeks and hatch of new larvae can be expected within the next week. Growing degree days are ahead of the norm, so we may see earlier hatch than usual. No infestations have been observed yet.

Weekly Trap Captures of European Corn Borer in Sweet Corn

Town	Date	ECB Z1	ECB E2	TOTAL ECB
		(IOWA)	(NEW YORK)	(combined)
Walpole, NH	June 5	1	3	4
Westminster, VT	June 5	3	26	29
South Deerfield	June 5	6	52	58
Sunderland	June 5	12	57	69
Hadley	June 5	11	36	47
Hadley	June 5	4	28	32
Southwick	June 5	14	12	26

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. This can occur even if tassels were not infested. New eggs may be laid near the ear, and larvae move directly into the ear. Many sweet corn growers have been caught by surprise with infestations they never suspected. In this situation it is very helpful to have traps on your own farm so you know when flight declines and silk is safe again. Weekly sprays on silk are recommended to control ECB during silking, as long as captures remain high (above 5 per week).

Its' 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. Scenty net traps baited with Hercon lures are recommended for earworm.

Sources for traps and lures: Great Lakes IPM (517) 268-5693 or Gempler's (800) 382-8473.

Vegetable IPM Newsletter, Ruth Hazzard, Editor and Stephanie DeGray, Assistant Editor. The Vegetable IPM Newsletter is published weekly from May to September and includes contributions from the faculty and staff of the UMass Extension Vegetable Program, other universities and USDA agencies, growers, and private IPM consultants. Authors of articles are noted; author is R. Hazzard if none is cited.

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