



VEGETABLE IPM MESSAGE

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CROP CONDITIONS

There was widespread rain last Thursday evening, but precipitation varied from a trace to over an inch and a half. The current high temperatures are pushing warm season crops, and except for those such as lettuce, most look great. Matt Rulevich in Belchertown reported **Cucumber Beetles** in his cucurbits, and **Three Striped Potato Beetles** in his potatoes.

Moisture loss is rapid during hot weather. Some field tomatoes and summer squash are being harvested and some of the earliest corn under row covers or plastic should be ready any day now. Some growers are still putting in late sweet corn plantings.

Evapo-transpiration (evaporation from the soil plus transpiration from the leaves) can be as high as 1/3 inch of water per day when it is hot, sunny and breezy with low humidity. We are probably not losing moisture at this high a rate, but it certainly is greater than the commonly mentioned "one inch per week". It is easy to delay irrigation when there is a chance of rain, but waiting too long has hurt many a crop. Plants begin to suffer from stress well before they show signs of wilt.

John Howell

WATCH FOR ONION THRIPS

Hot weather brings not only tiring and sweaty fieldwork, but also **onion thrips**, which can cause considerable damage to onions and other alliums and to cabbage. Their populations can increase very rapidly during hot weather and may go unnoticed

until serious losses occur. Thrips are night feeders and hide during the day.

Scout fields: by looking in the dark areas between leaves. It is important to control these insects early while populations are low.

Identification: When they are immature they are from 0.5 to 1.2 mm, with an elongated, elliptical and slender body that is white to pale yellow. Their eyes have darker coloration and are easy to see. Immature thrips have short antennae. The difference between immatures and adults is that immatures do not have wings, so they cannot fly. The majority of immature thrips are found between the young leaf blades at the top of the plant. To observe them you need to separate the leaves from the neck. The pupae are pale yellow to brown and appear as an intermediate form between the immature and the adult. They have short antennae and the wing buds are visible but short and not functional. At this stage thrips do not feed. When they are adults they are pale yellow to dark brown and can be up to 2 mm. Adults have fully developed wings that are very different from other insects. They have a single longitudinal vein in which there are several hairs connected perpendicular to the vein. The wing appears as fringe with hairs. When at rest, the wings are folded along the back of the insect. Adults are more mobile than immatures and pupae because they can fly. They are attracted to yellow and white colors. They often will fly to one's clothes or land on exposed skin.

Seedlings: Direct seeding of onions prolongs the growing season in the field and the susceptibility to thrips infestation.

If the crop is going to be transplanted, the seedbeds should be distant from the old plantings and new plots to be planted. It is very important that onion seedlings are clean of thrips before transplanting to the field. Remove unharvested plant parts volunteer onion plants are an important source of infestation for thrips.

Thrips prefer to feed on the young plant tissue on the newest emerged leaves. When the leaf grows, the previous damage produced by the thrips enlarges, leaving empty spaces in the surface of the leaf. The appearance of the damage is silvery patches or streaks on the leaves that shine in the sun. When damage is severe, these small patches can occupy most of the surface of the leaf and the plant cannot adequately photosynthesize. The plant loses more water than normal through the damaged tissues and plant pathogens penetrate the injured plant easily.

John Howell, Stephanie DeGray & Cornell University

TOMATO

White Mold (*Sclerotinia*), as well as **Gray Mold** (*Botrytis*) on tomatoes was observed by Dale Riggs last week. Botrytis (gray mold) appears as a fuzzy gray mold on leaf petioles. Bacterial diseases such as **Bacterial Canker** have been reported due to favorable conditions. If your farm has a history of bacterial canker, (it appears as a leaf wilt, with marginal necrosis, and dark lesions with a chlorotic border) or you have significant acreage of tomatoes and did not hot-water treat your seed, include copper along with maneb and/or chlorothalonil in your initial spray.

Be watchful of **Early Blight!!** The DSV's have accumulated to 44 already!! (See last week's newsletter for information on Tom Cast and DSV information.) Tomatoes that have not received their first fungicide application should certainly be sprayed. After the first spray, we recommend that growers make fungicide applications intervals that depend on weather conditions and TOM-CAST reports. When the DSV accumulation reaches 15 DSV's since your last spray, it's time to apply fungicide again. The fungicide should help prevent **Late Blight** as well.

For recommended materials see the New England Vegetable Management Guide and/or call the UMass Plant Disease Diagnostic Lab at: 413-545-1045 for diagnosis.

DSV update: DSV VALUES, June 18–July 2, 2002 SOUTH DEERFIELD RESEARCH FARM

Date	DSV's/Day	Date	DSV's/Day
June 18	0	June 26	0
June 19	1	June 27	1
June 20	1	June 28	2
June 21	1	June 29	3
June 22	2	June 30	1
June 23	3	July 1	0
June 24	2	July 2	2
June 25	1	Cumulative DSV's since May 24	44

LATE BLIGHT, (*PHYTOPHTHORA INFESTANS*)

Late Blight has been observed in Pennsylvania, New Jersey and Michigan!! Look for pale green to brown spots, sometimes with a purplish tinge on the upper surface of the leaves. Edges of the leaf spot may be pale green or water-soaked. If you suspect late blight, please contact the Diagnostic Lab for a diagnosis.

Late Blight Control: What Are the Options? Destroy cull piles and volunteers, both of whom may be sources of late blight inoculum. Tubers in stone piles at the edge of fields can also be a problem. The goal is to prevent the development of green leaf tissue and subsequent infection and sporulation of the late blight fungus.

Scout aggressively for signs of late blight. Late blight can occur on stems as well as on leaves. When a canopy develops, look for blight in the lower portions of the plant where the foliage stays wet. Take care not to spread late blight from field to field when scouting. Rubber (or disposable) pants and boots, which can be washed after leaving a field, should be used if disease is present. Inoculum can be carried from field to field on equipment, but is easily removed by washing with water. For organic growers, several fixed copper fungicides are available (Basicop, Champ, Kocide, etc.) and provide fair control of late

blight and early blight, again if used preventatively. These and other copper products are registered for use on both potato and tomato.

Application methods: The key word here is coverage. Thick canopies, stem infections, and lower canopy infections, all translate into the need to deliver fungicides in the most effective manner. Slowing the tractor speed, adjusting boom height to the appropriate level over the plant canopy, and entering the field from a different direction each time you spray may provide better coverage.

J. Lerner, R. Wick, R. Hazzard & S. DeGray

SMALL FRUIT TWILIGHT MEETING: HAMILTON ORCHARDS, THURS. JULY 25

On Thursday, July 25, from 5 to 7:30 PM, Hamilton Orchards, located at 25 West Street in New Salem, MA, will host a Twilight Meeting. Barb and Bill Hamilton are pioneering new production methods for containerized production system for raspberries using varieties that are not winter hardy in our area; and discuss field grown raspberry and blueberry production and pest management issues. One hour of Pesticide Recertification Credits per attendee will be offered. Not only can you gain information for your business, meet with friends and engage with your peers, you can also gain credits. Contact: Sonia Schloemann, 413-545-4347.

Directions: From the Boston area, take Route 2 West to Route 202 (Exit 16), heading toward Belchertown/Amherst. Travel about 7 miles to the center of New Salem. Look for the New Salem General Store, then go about 1 mile and turn right onto West Street. The farm is about 300 yards down the road. From the south, take I-91 North to Route 202 in Holyoke. Travel about 30 miles. There will be a sign on the left for Hamilton Orchards. Turn left onto West Street. The farm is about 300 yards down the road.

NORTHEAST SWEET CORN PEST MONITORING NETWORK

This growing season we have teamed up with Pennsylvania State Cooperative Extension as well as the other members of the Northeast Pest Watch Monitoring Network so that we may better provide you with sweet corn pest information. For several

weeks now, we have been posting our **ECB** trap captures on the site, and will be posting **CEW** and **FAW** numbers as they become available. The site provides fact sheets, previous years' data, thresholds and other related links. It also shows a map of the entire northeast region with trap data on sites throughout the region. Watch the progress of CEW up the coast, or the progress of second-generation ECB emergence. For every site, you can see a graph of captures through the entire season.

You may also get to our UMass Vegetable Sweet Corn website through a link on the main page!! We will be adding a link to this exciting site on the Pest Alert section of our website soon. In addition, we will be adding our own sweet corn threshold information and factsheets, which are more relevant to our growers in the Northeastern part of the country as well as available pest controls for organic and non-organic growers.

To get to the main page of the Northeast Pest Watch Monitoring Network type:

<http://pestwatch.cas.psu.edu/>. Then,

click on the Sweet Corn cartoon in the top left of the page (shown here). Once you are on the Sweet Corn Pest Monitoring page, click on any of the links listed under Most Recent, which is bold faced. Stay tuned for more information on this exciting project!



S. DeGray & R. Hazzard

SPECIALTY CROPS: CROP REPORTS

Two of our twilight meetings this summer – one at South Deerfield Research Farm, on July 16 – posted in the June 20th issue; and the second at Forbidden Fruit Farm in Southeastern Mass., Wednesday, Sept. 4th, from 5-7:30 p.m. (see Twilight Meeting brochure enclosed in this mailing or got to: <http://www.massfarmstands.com/twilight.html> for more information) will highlight demonstration plantings of a wide range of specialty crops. This week we are beginning a series of articles about some of the crops that you will see at these sites. These crops provide new opportunities for reaching expanding ethnic and specialty markets in Massachusetts.

CHINESE BROCCOLI: (*BRASSICA OLERACEA* VAR. *ALBOGLABRA*)

Other names: Chinese kale, Flowering kale (English) kailan (Cantonese), Gai lan, Jie lan (Mandarin), cai rô (Vietnamese), Kat Na (Khmer). This crop resembles our more familiar broccoli with a longer stem and very small head. Unlike many other Asian greens in the Brassica family, this crop has a thick stem like cole crops that originated in the Mediterranean, such as broccoli, cauliflower, and Brussels sprouts (“cole” means stem in old English). You’ll notice that Chinese broccoli is the same species as the crops from the Mediterranean (oleracea). It is believed that early Portuguese explorers brought their Portuguese cabbage to Asia and through generations of selections it has developed into this Chinese broccoli.



Chinese broccoli in Sterling, Mass. Photo by Frank Mangan.

Production: Direct seed and thin to 4 to 15 inches apart in the row and nine inches to two feet between rows, depending on the size of plant desired. The stem is harvested just as the flowers emerge. Like European broccoli, Chinese broccoli can be harvested multiple times. When you harvest the main shoot the first time, auxiliary shoots grow, which can be harvested two more times. Shoots will be smaller each time. Many people will harvest once and use multiple plantings for constant supply.

There are many open-pollinated varieties of Chinese broccoli available. One disadvantage to open-pollinated varieties is that the inflorescence will appear at different times. This makes harvest much more difficult. The two more common hybrid varieties available in the States are "Kailaan" and "Green Lance".



Chinese broccoli for sale in Asian market in new York City. Photo by Frank Mangan.

Seed Sources: Evergreen Y.H. Enterprises, P.O. Box 17538, Anaheim, CA 92817; Siegers Seed Company, 13031 Reflections Drive, Holland, MI 49424; Sunrise Enterprises, P.O. Box 10058, Elmwood, CT 06110; Tsang & Ma, P.O. Box 5644, Redwood City, CA 94063.

Frank Mangan, Plant & Soil Science, UMass

YU CHOY: (*BRASSICA RAPA*)

Other names: You cai, cai hua (Mandarin) Yai tsoi (Cantonese). Yu Choy is grown mainly for the young leaves and flowering stalks. For centuries it was grown for the oil in its well-developed seeds that were used in cooking and lamps. It is easy to confuse Chinese broccoli and Yu Choy (see picture of Yu Choy below) since they look similar. The two main distinguishing features are Yu Choy has white yellow flowers (Chinese broccoli has white flowers) and Yu Choy has a thinner stem. Based on surveys in markets in Dochester (where there are 20,000 Vietnamese) Yu Choy is more popular than Chinese broccoli.

Yu Choy comes under the group of Chinese greens referred to as choy sum. The word means, “flowering stem”. Any flowering brassica can be referred to as

choy sum, although it is usually not used for Chinese broccoli. Yu Choy is also called Green Choy Sum in some parts of China to distinguish it from other flowering brassica that have white



Yu Choy in Asian market in New York City. Photo by Frank Mangan.

stems. The plant grows vigorously in our spring and fall, but has a tendency to bolt prematurely in hot summers.

Production information: It is similar to Chinese broccoli and may have higher density plantings depending on the size of plant desired.

Seed Sources: Evergreen Y.H. Enterprises, P.O. Box 17538, Anaheim, CA 92817; Siegers Seed Company, 13031 Reflections Drive, Holland, MI 49424; Sunrise Enterprises, P.O. Box 10058, Elmwood, CT 06110; Tsang & Ma, P.O. Box 5644, Redwood City, CA 94063.

Frank Mangan, Plant & Soil Science, UMass.

MESSENGER: A NEW PRODUCT FOR MANAGING PESTS AND IMPROVING YIELD IN VEGETABLES AND OTHER CROPS

Messenger® (EPA Reg. No. 69834-2) is a biochemical pesticide from Eden Bioscience for plant disease management, insect suppression, and plant growth enhancement. It is now labeled throughout the United States. Messenger can be used on a broad spectrum of crops, including vegetables, grown in field, greenhouse, shadehouse, and nursery production. It is labeled for use on the following vegetables: asparagus, artichoke, sweet corn, cucurbits, tomato, pepper, eggplant, leafy and cole crops, beans and other legumes, beets and other root crops, potato, onion, garlic, and scallion. Messenger is virtually non-toxic and degrades rapidly leaving no detectable residue. This product is promoted as a foundation for IPM programs because of its ability to increase plant health without adversely affecting beneficial organisms.

Messenger contains a new active ingredient, HarpinEa. It is based on naturally occurring proteins called “harpins” that are produced by bacteria and other microbes. More specifically, HarpinEa is chemically identical to the harpin produced naturally by *Erwinia amylovora*, the plant pathogenic bacterium that causes fire blight. Zhongmin Wei discovered the harpin protein while working in the laboratory of Steven Beer in the Department of Plant Pathology at Cornell University. HarpinEa does not have any direct pesticidal effect on insects or pathogens. It works to increase the ability of plants to resist

disease. Diseases listed on the label include **Bacterial Spot** and **Phytophthora Root Rot** of tomato and pepper; **Bacterial speck**, **Root-Knot Nematode**, and **Fusarium Wilt of tomato**; and **Cucumber Mosaic Virus** affecting cucurbits and eggplant. Messenger reportedly reduces damage caused by some insects through making plant material more difficult for insects to digest.

Messenger has shown promising results in some research trials, especially against bacterial diseases in tomato and pepper and against **Powdery Mildew** in numerous crops. While evaluating efficacy of Messenger for various diseases and insect pests, it was noted that this product also enhances plant growth. Both nutrient uptake and photosynthesis are stimulated. This has resulted in earlier yield and increased yield. Research is underway in the northeast to determine whether these growth effects that were observed in Florida and California also will occur under our climatic conditions. Thus only trial use can be recommended in the northeast until this work is done.

Growers planning to try Messenger need to be aware that the current formulation cannot be used with chlorinated water. Either use well water or other non-chlorinated water, or obtain WTA, which inactivates chlorine, from Eden Bioscience. Also, note that the product does not keep after the package is opened; therefore it is marketed in single-use packages. Current guidelines are to apply Messenger as a foliar spray at approximately 14-day intervals beginning at least 5 days before transplanting. The label specifies that it can be tank mixed with other pesticides, depending on restrictions listed on other products. The label includes guidelines for applying Messenger as a drench for greenhouses set-up to apply pesticides this way (section 12); however, material applied to foliage will have the greatest impact. A maximum annual use rate is not specified on the Messenger labeling.

Adapted by R. Wick & R. Hazzard from an article by Margaret McGrath, Long Island Hort. Resrch & Ext. Ctr, Cornell Univ.

SWEET CORN

European corn borer flights of the E strain are continuing to decline – while the Z strain is increasing in some areas.

Flights are low enough that silking corn no longer needs to be sprayed on a regular basis. The exception is far western Mass, on the border of New York State, where the one-generation Z-strain moth may be present appears to be on the increase. For most of Massachusetts, this is the lull between the two flights of ECB. There may still be larval infestations in pretassel stage that needs to be cleaned up but these are spotty and should be based on scouting. We are recommending that growers keep spraying where 10+ moths are being found. Keep scouting!!

Corn Earworm flights remain low and are below threshold throughout most of the state. The exception was near the coast in the Southeast, where captures were at 2 or 3 moths per week. When captures are between 1.4 and 3.5 per week we recommend that growers spray at a 6 day interval. Yet the spray interval should be lengthened by one day if daily maximum temperatures were below 80° F for the previous 2-3 day period. This is the time when careful use of IPM monitoring methods saves you sprays! However, watch for coastal storm fronts that could bring new migratory flights into the region. At this time of year, having your own trap is well worth the time and trouble. As more and more corn approaches silking, more acreage is vulnerable to the sudden arrival of migratory corn earworm flights. We typically have about 3-5 days (depending on temperature) from arrival of new moths (ready to lay eggs) till hatch of eggs laid on corn silks and invasion of ears by young caterpillars. Yet, with this week’s heat wave, not only are the crops moving faster, but also the bugs!!

R Hazzard, S DeGray

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.

SWEET CORN WEEKLY PHEROMONE TRAP				
TOWN	DATE	ECB Z1	ECB E2	TOTAL ECB
		IOWA	NEW YORK	
N. Bennington, VT	June 27	4	5	9
Sheffield, MA	July 3	0	4	4
Hatfield, MA	July 3	3	2	5
Walpole, NH	July 2	0	2	2
Plainfield, NH	July 2	10	4	14
Westminster, VT	July 2	0	2	2
South Deerfield	July 2	2	2	4
Sunderland	July 2	2	5	7
Hadley #1	July 2	6	33	39
Hadley #2	July 3	14	4	18
North Andover	June 28	14	6	20
Ipswich	June 28	50	5	55
Dracut	July 2	0	5	5
Lancaster	July 2	4	0	4
Still River	July 3	0	13	13
Concord	July 1	25	4	29
Leicester	July 2	14	4	18
Northbridge	July 2	2	1	3
Belchertown	July 3	16	3	19
Rehobeth	July 3	5	2	7
Dighton	July 3	1	10	11
Sharon	July 3	2	3	5

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.

Where trade names or commercial products are used, no company or product endorsement is implied or intended. Always read the label before using any pesticide. The label is the legal document for product use. Disregard any information in this newsletter if it is in conflict with the label.