UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

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CROP CONDITIONS

Harvesting is keeping everyone busy, and growers report that yields thus far this season have been excellent. Retail markets are busy and demand is good. At the wholesale level, great yields throughout the region puts a downward pressure on price. Fruiting crops eggplant, tomato and pepper, are coming in at a faster pace. The shift from early corn varieties to main season corn varieties is taking place, creating pressure for higher quality and larger size ears. Weather in the past week has ranged from cool with low humidity, to cool cloudy and moist, to hot and muggy with strong sun. At the moment, it seems that for most of the state, conditions are getting drier and rain is needed. On the other hand, we've seen the first outbreaks of Phytophthora capsici in squash fields which probably got started after some recent heavy rains. More diseases are showing up in cucurbits (see update) and other crops.

We have observed potato leafhopper in beans, eggplant, potato, and raspberries where it was not controlled. Look for nymphs on the undersides of leaves, along with signs of injury. In beans, apply controls early in crop growth to avoid injury to the crop and avoid the need to treat during flowering when bees are active.

Bee health is on many peoples' minds. Honeybees visit many vegetable crops for the resources these crops provide find including pollen (think sweet corn) and nectar. Bees are critical for pollination in squash and pumpkins, cucumbers and melons, and in beans. There are also native bees, including squash bees and bumblebees that play an important role in pollination. It appears that Colony Collapse Disorder has not hit Massachusetts beehives as hard as in some areas of the nation, and the causes of CCD have yet to be determined, but it is still important to consider bee safety when selecting insecticides to use in crops that are visited by bees as well as in adjacent fields and crops.

MORE IPM FIELD SCHOOLS AND THE VEGETABLE RESEARCH FIELD DAY ARE COMING RIGHT UP!

Many thanks to our host farms for the three IPM Field Schools held so far this season – Riverland Farm, Warner Farm, and Foppema Farm. Walking the fields with an eye on crop health, we find plenty to observe and talk about at every meeting. We hope you will find time to break away during August or September to attend one of our upcoming meetings!

All meetings will take place rain or shine, 4-7 pm (September meeting is 3-6 pm) and each will offer two contact hours of pesticide recertification credit. Cost is $20 per person per meeting, ($15 per person with 4 or more registions for any meetings from one farm).

Dates:

August 8 (Wednesday), Golonka Farm, Hatfield

August 15 (Wednesday), Paradise Hill Farm, Westport

August 21 (Tuesday) Field Day at Crop Research and Education Center,South Deerfield, MA

September 18 (Tuesday), Howden Farm,Suffield

ORGANIC CONTROL FOR CORN EARWORM IN SWEET CORN.

Now that corn earworm has been found in the state it is time to take control measures. While foliar sprays of Bt or Entrust will be effective for control of European corn borer in the tassel, additional measures may be needed for control of corn earworm. Foliar sprays of Entrust can control CEW when the pressure is light; however, direct silk applications of vegetable oil mixed with a pesticide will reduce corn earworm and corn borer damage to ears by coating the silk channel and the kernels in the tip where CEW (and also some ECB) larvae feed. This method may be used alone or in combination with foliar sprays. Certified organic growers must be careful to select approved materials. A handheld oil applicator (the Zealater™) designed to make this hand-application method economical and comfortable, is available from Johnny's Selected Seeds (877-564-6697). The UMass Extension Vegetable program has an eight-page publication, Organic Insect Management in Sweet Corn: Scouting, Thresholds and Management Methods for Key Caterpillar Pests in Sweet Corn, describing the pests, monitoring methods, materials, tools, timing, and how to integrate oil applications with other methods. Contact the Extension Bookstore (413-545-2717) or the Vegetable Program office (413-545-3696) to obtain a copy.

Success with the direct oil method takes attention to detail and timing. Here is a summary of some key points:

Timing. Corn should be treated with 0.5ml (not 5.0ml!) of oil, once during early silk stage. Action should be taken when >2 corn earworm moths are found per week in a trap in your area. The best time to apply oil is generally 5-7 days after silk growth starts, or 3-4 days after silk is full grown. At this time, the tips of the silks have just begun to wilt and turn brown and pollination is nearly complete. A good way to check the timing is to carefully husk a couple of representative ears and examine the kernels. The ideal time to treat is when the silk is still attached to the top 1" or less of the kernels. Applications made too early after

silk do not give better control, but may result in a higher rate of "cone" tips. This occurs when oil interferes with silk pollination resulting in unfilled kernels in the tip. While partially filled tips are a relatively common occurrence in sweet corn, cone tips caused by oil can be more pronounced. Oil applied too late after silk initiation can result in more feeding damage to the kernels caused by caterpillars that entered the ear prior to the oil. There is a window, somewhere between 5 and 8 days after silk initiation, that provides the best combination of corn earworm control and ear fill.

Materials. We recommend using corn oil or soy oil with added spinosad (Entrust). Non-organic corn oil is ok to use on certified organic corn in Massachusetts and many other states. Organically certified growers will need to use a dry formulation of pesticide and can add an emulsifier to the oil to keep the pesticide suspended in the oil. We have had luck with liquid lecithin. Add 5% volume of liquid lecithin to the oil before adding the dry material that has been suspended in water. Liquid lecithin is the consistency of molasses: we strongly recommend that you add it directly to the oil instead of measuring into a separate container first. Lecithin will mix more readily with oil than water, making cleanup difficult: be careful not to spill the lecithin. Use the labeled rate of pesticide per acre in corn. Add this to the approximately 2 gallons of oil it takes to treat 1 acre.

For the Bt product that we used in our trials (Dipel DF) this translated to approximately 3 tablespoons of Bt per liter of oil for an application rate of 1/2 lb Bt per acre.

For 2 oz per acre of Entrust (assuming 16,000 ears/acre), use 0.25 oz per liter of oil, which is approximately 4 tsp per liter of oil.

If you have any questions please contact Pam Westgate at westgate@umext.umass.edu or 413-545-3696.

-Pam Westgate, UMass Extension

NOT ALL COPPERS ARE CREATED EQUAL

Nor are their labels. Copper is copper - right? Not quite! A detailed look at the labels (regular and 2ee) shows that not all registered copper fungicides have the same level of metallic copper and the active ingredients also vary. Only five of the 18 registered copper products listed below are approved by OMRI (Organic Material Review Institute) for consideration in organic production. There are also variations in the coppers approved for use on various crops, so consult each bag label before purchasing a product.The table below is based upon the most recent labels

Copper compounds registered in NYS for vegetable production - Not All Coppers Are Created Equal - Nor Are Their Labels T.A.Zitter July 2007

Trade Name	Source	Active ingredients	% Metallic Cu	OMRI*	Beans*	Crucifers*	Ca, Cel, Be*	Cucurbits*	Let, En, Es, Sp*	On, Gar, Le*	Tom, Egg, Pep*	Pot*	Gr He On Label!	Misc, Wa, Ch, Di, Rt*
Badge SC	Isagro	17.6% Copper oxychloride; 16.4% Copper hydroxide	20%	No	Gr, Dr	X	X	X	Sp	O,G	TEP	X	Yes	All
Basic Copper Sulfate 53	Albaugh	98% Basic copper sulfate	53%	Yes	Gr, Dr	X	X	X	All	On	TEP	X	No	No
Basic Copper Sulfate	Old Bridge	99% Basic copper sulfate	53%	No	Gr, Dr	X	X	X	Le, Sp	O	TEP	X	No	No
Champ 2 F	Nufarm	37.5% Copper hydroxide	24.4%	No	Gr, Dr	X	X	X	Le,En,Es	O,G,L	TEP	X	Yes	All
Champ Dry Prill	Nufarm	57.6% Copper hydroxide	37.5%	No	Gr, Dr	X	X	X	All	O,G,L	TEP	X	Yes	All
Champion WP	Nufarm	77% Copper hydroxide	50%	Yes	Gr, Dr	X	X	X	Sp?	O,G	TEP	X	Yes	All
C-O-C-S WDG	Loveland	74.8% Copper oxychloride;14.2% Basic copper sulfate	50%	No	Gr, Dy	X	X	X	L (Hd, Lf) Sp	O	TEP	X	No	No
Cuprofix Disperss DF	Cerexagri	36.9% Basic copper sulfate	20%	No	Gr, Dy	X	X	X	Sp	O	TEP	X	Yes	All
Cuprofix MZ Disperss DF	Cerexagri	22.1% Basic copper sulfate; 30.4% mancozeb	12%	No	-	-	-	SS Cuc Mel	-	O, Dry	T	X	No	No
Cuprofix Ultra 40 DF	Cerexagri	71.1% Basic copper sulfate	40%	No	Gr, Dy	X	X	X	Sp	O, G	TEP	X	Yes	All
Kentan DF	Isagro	61.3% Copper hydroxide	40%	No	Gr, Dy	X	X	X	Sp	O, G	TEP	X	Yes	All
Kocide 101 WP	Dupont/Griffin	77 % Copper hydroxide	50%	No	Gr, Dy	X	X	X	Sp	O, G	TEP	X	Yes	All
Kocide 2000 DF	Dupont/Griffin	53.8% Copper hydroxide	35%	Yes	Gr, Dy	X	X	X	Sp	O, G	TEP	X	Yes	All
Kocide 3000 DF	Dupont/Griffin	46.1% Copper hydroxide	30%	Yes	Gr, Dy	X	X	X	Sp	O, G	TEP	X	Yes	All
ManKocide DF	Dupont/Griffin	46.1% Copper hydroxide; 15% mancozeb	30%	No	-	-	-	SS Cuc Mel	-	O, Dry	T	X	No	No

available, and most are given on the PIMS (NYS Pesticide, Product, Ingredient, and Manufacturer System) web site, but there are a few exceptions since manufacturers do not always get their new labels to DEC in a timely fashion for approval. Labels that varied the most were for leafy vegetables (lettuce, endive, escarole, and spinach), as well as for onions, garlic and leeks. Coppers combined with mancozeb (2 products) are more restrictive in their usage and cannot be used up to the day of harvest, as is true for other copper products.

Coppers are also an important component for disease control when combined with other fungicide products. These have been registered in the state as 2ee and apply for diseases of cucurbits (Phytophthora Blight), pepper (Bacterial leaf spot and Phytophthora blight), potato (diseases, desiccation and vine killing), and tomato (Bacterial leaf spot). Consult the 2007 Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production or the PIMS web site for the latest information. The NYS Pesticide Product, Ingredient and Manufacturer System (PIMS) http://pmep.cce.cornell.edu/pims/

Note: Section 2 registrations are state by state. For Massachusetts registration data see:

Massachusetts Dept of Agricultural Resources, Pesticide Bureau database of pesticides registered in MA:

http://state.ceris.purdue.edu/doc/ma/statema.html

OMRI = Organic Materials Review Institute as of May 4, 2007

Key to Table

Beans = Green and Dry, if NS, then not specified on label but assume can be used per all other copper labels; **Crucifers** = Applies for most , but not all, see label; **Ca, Cel, Be** = Carrots, celery and Beets; **Let, En, Es, Sp** = Lettuce, Endive, Escarole, and Spinach and will vary by copper product, **On, Gar, Le** = Onion, Garlic, leek, varies by copper; **Tom, Egg, Pep** = Tomato, Eggplant, Pepper; **Pot** = Potato; **GrHs** use is specifically mentioned on the label, (but according to EPA ruling, others may also be used unless specifically mentioned): Miscl = Watercress, Chives, Dill and Parsle

-Tom Zitter, Cornell University

SUCCESS AGAINST IMPORTED CABBAGEWORM

Imported cabbageworm (*Pieris rapae*) has long been one of the usual pests faced by cole crop growers, being the source of the large green caterpillars that contaminate broccoli and cabbage. In recent years, gradually, damage from this pest has declined. Since some other cole crop pests like diamondback moth, cabbage looper and flea beetles continue to be difficult to control, the reduced damage from imported cabbageworm has been welcome but likely not really noticed. What happened? In short, a biological control project begun in the 1980s against this pest here at UMass has matured to the point that it prevents a significant amount of damage from this pest.

In 1988, a braconid wasp (*Cotesia rubecula*) was imported from China by myself and, working with Ruth Hazzard, Alden Miller and John Howell (the latter two were the vegetable extension agents at the time), this species was released at 17 locations in the state. Work was carried on until 1992 and at that time it was clear that this parasitoid established and spread well. But its ultimate impact could not be seen at that time, as its populations were still increasing and spreading.

In 2007, I decided to follow up on the status of this parasitoid to see if it had become wide spread, if it was killing enough caterpillars to control damage, and what might have become of the less efficient parasitoid *Cotesia glomerata* that had long been established in the United States (since the 1880s). I visited 20 farms and searched cabbage, collards, or broccoli plants for imported cabbageworms, their pupae, or the cocoons of the parasitoids. I took the larvae back to the lab at UMass and dissected them to see if they were healthy or parasitized, and if parasitized by what species (*C. rubecula or C. glomerata*). What I found was amazing.

1. The parasitoid is now established everywhere I looked, being found at 20 of 20 sites, in 13 towns and four counties. It was found both in the commercial farms along the CT river valley and in Worcester County, in organic farms in the hill towns, and in community and private gardens. It was even found at very isolated sites, where just small numbers of cole crops were being grown in landscapes that were mostly forested.

2. The level of parasitism is very high. At 16 of 20 sites, it was over 60%. The average for all the sites pooled was 75%. Because this parasitoid kills caterpillars when they are less than 1/3 grown (4th instar), over 70% of the damage that might be done by a healthy caterpillar is prevented. In my survey, only 10% of the larvae I found were the large mature larvae (5th instars) that do most of the feeding. At nearly all the survey sites, such large larvae were scarce. Instead of them (and their feeding and frass), plants often showed just a few small holes from feeding of young larvae (easily overlooked and not affecting quality) and cocoons of *C. rubecula*. At only one site were large larvae common, the farm with the lowest level of *C. rubecula* parasitism (9%) in the survey. At this site damage (very tattered leaves on cabbage and obvious piles of caterpillar frass) was very apparent. This site produced cabbage on black plastic, which likely heated the area around the plants, perhaps making them unfavorable for the parasitoid. This speculation is plausible since the parasitoid was common in the general area at higher levels, but for local reasons failed to thrive on this particular farm, which was the only location using black plastic.

3. The once common parasitioid, *C. glomerata*, is now virtually gone. It has been replaced by the more efficient *C. rubecula*. Over 99% of all *P. rapae* parasitism observed was due to *C. rubecula*. This shift is very favorable to growers as *C. rubecula* kills young larvae, but *C. glomerata* permits parasitized larvae to feed to their full size.

In conclusion, this result shows that classical biological control has the potential to make permanent, widespread improvements for farmers by suppressing pests.

-Roy Van Driesche, PSIS/Entomology, UMASS Amherst

CUCURBIT UPDATE: PLECTOSPORIUM AND POWDERY MILDEW HAVE ARRIVED!

This past week we have found powdery mildew at several locations across the state. As usual, it shows up first in the older summer squash and zucchini plantings. It starts as a few small round patches of white mycelia on upper or lower sides of older leaves, and soon spreads across the leaf. The most cost-effective use of fungicides for powdery mildew follows these principles: begin sprays when the disease first occurs, not after it has reached epidemic proportions; use the most effective, newer systemic products first (eg Pristine (a combination of pyraclostrobin, Group 11 and boscalid, Group 7) or Nova 40W (5 oz rate) or Procure 50WS or 480SC (8 oz or 8 fl oz rate) (both are DMI Group 3 fungicides, so choose one); use each class of systemic fungicide only once (eg one stroblurin spray, one DMI spray) and always mix a systemic single mode of action fungicide with a protectant such as chlorthalonil or maneb. Sulfur has both contact and vapor action and is effective against powdery mildew; maintain a 10 day spray schedule.

Plectosporium was found this week in both the Connecticut Valley. Scout summer squash, zucchini and pumpkins for symptoms on stems, petioles, and fruit. Catch it early in pumpkins to avoid injury to fruit, which can ruin the crop. Till under summer squash and zucchini as soon as harvest is over to get rid of a hefty source of inoculum that will hit later plantings. Avoid trying to squeeze out the last pick if you have another planting coming in. It may be low priority to pull up plastic on early squash at this point in the season, but worthwhile when we have 6-10 more weeks of squash picking ahead of us.

This season's Cucurbit Disease Management Project, funded by EPA through the new England Vegetable and Berry Growers Association, includes funding for disease diagnostics. Our goal is to help growers know what's out there and to manage it better! If you are stumped on what disease is hitting one of your cucurbit crops, contact the Disease Diagnostic Clinic at 413-545-3209 or contact Andy Cavanagh at 413-577-3976.

Downy mildew has not been found in New England or eastern New York. The current risk for this disease to reach New England is low. You can follow the forecasts at the website: http://www.ces.ncsu.edu/depts/pp/cucurbit/forecasts/c070724.php

The lack of extremely heavy rains is a welcome relief and may be responsible for delaying outbreaks of Phytophthora. There have been a few areas of the state which have been hit with heavy downpours and standing water, and of course irrigation can also cause outbreaks if any place in the field remains saturated for a couple of days. Phytopthora capsici was found this week in one planting of early summer squash in the Connecticut River Valley. The planting was promptly plowed under to reduce the risk to nearby winter squash.

BLACK ROT (GUMMY STEM BLIGHT)

Gummy stem blight caused by *Didymella bryoniae* is also called Black Rot when it occurs on the fruit. It affects the leaves, stems, and fruits of all cucurbit species. In temperate regions, the disease is most serious on squash and pumpkins. There is evidence that some isolates are more virulent than others, indicating that there is diversity in pathogen populations.

Symptoms consist of circular, tan to dark brown spots, which enlarge rapidly blighting entire leaves. Lesions on stems result in cankers which exude a brown, gummy substance. Stems may be girdled and seedlings killed. On older plants, cankered vines wilt after mid-season and small, water soaked spots develop on infected fruit, enlarge, and also exude a gummy material. Small, black fruiting bodies appear as black specks (pycnidia and/or pseudothecia) in lesions, especially on fruit resulting in the typical 'black rot' symptoms.

The pathogen survives between seasons on diseased crop debris and may be seed borne. Moisture is more important for disease development than temperature. The use of certified, disease free or treated (hot water or fungicide) seed should be a standard practice. Carefully examine transplants and remove diseased plants. Greenhouse production should include increased ventilation and reduced overhead irrigation. Crop rotation of at least two years is recommended. Avoid injuring fruit before or during harvest, as wounds enable the pathogen to invade fruit in the field and in storage.

Satisfactory chemical control can be obtained by regular applications of protectant fungicides. There are reports of control failure with strobilurin fungicides (Amistar, Cabrio, Flint) indicating that resistant isolates are present.

Gummy Stem Blight/Black Rot sprays should include:

chlorothalonil or maneb alt with Quadris (1X only) or thiophanate-methyl (Topsin M)

Mancozeb (not for pumpkins or winter squash)

-Bess Dicklow, UMass Extension

POWDERY MILDEW OF CUCURBITS: 2007 UPDATE

Powdery mildew is a major production problem in cucurbit crops in all parts of the world. All cucurbits are susceptible, but the disease is less common on cucumber and melon due to the prevalence of resistant cultivars. Yields are reduced by a reduction in the number and/or size of fruit. Fruit quality can also be adversely affected by sunscald (due to defoliation), incomplete ripening, reduced storability (winter squash), and poor rind quality or discolored handles (pumpkins). In addition, infection by Powdery mildew predisposes plants to other diseases (Gummy stem blight).

Symptoms occur on both leaf surfaces, stems, and petioles as white, powdery fungal growth. Symptoms develop first on older leaves, shaded lower leaves, lower leaf surfaces, and on older,

fruit bearing plants. Infected leaves shrivel and die; plants may senesce prematurely. The pathogens are obligate parasites and cannot survive in the absence of living hosts; initial inoculum for the Northeast is most likely airborne conidia originating in southern states. Other possible sources include greenhouse grown cucumbers and alternate hosts. Under favorable conditions, Powdery mildew develops rapidly; the time between infection and symptom expression can be as short as 3 days and many spores are produced. Conditions favoring infection include a dense plant canopy, low intensity light, high nitrogen fertilization, and high relative humidity (although infection can occur at relative humidity of less than 50%). Optimum temperatures for disease development are 68-80˚ F; infection can occur between 50-90˚ F. Temperatures of 100˚ F or above stop Powdery mildew development.

Plant resistant varieties where available; resistant varieties of squash and pumpkin are under development. Separate successive cucurbit plantings physically to prevent older plants from serving as an inoculum source for main crop. Scout fields regularly (particularly lower leaf surfaces) and apply fungicides **early** in disease development. Powdery mildew cannot be effectively controlled by fungicide applications after the disease is established. Powdery mildew develops best on the lower leaf surfaces; thus a successful fungicide program requires controlling the pathogen on both leaf surfaces.

An important component of fungicide programs are materials which can move to the lower surface (systemic or translaminar). Systemic fungicides, due to their single site mode of action, are prone to resistance development and the powdery mildew fungi have demonstrated the ability to develop resistance to this type of fungicide: (benzimidazoles (Topsin M) and strobilurins (Flint, Cabrio, Amistar, Quadris). Managing resistance is an important consideration when selecting a fungicide program. Current recommendations for managing resistance consist of an alteration of effective high-risk materials of two or more chemical classes at 7-10 day intervals, with a protectant fungicide included in every application. A protectant fungicide has multi-site activity, low resistance risk, and will control strains resistant to the systemic chemical.

Systemics:

myclobutanil (Nova): 0 dh, REI 24 h, Group 3. Use high rate only. Observe a 30 day plant-back interval.

pyraclostrobin plus boscalid (Pristine): 0 dh, REI 12 h, Groups 11 & 7. Do not alternate with other **strobilurin** fungicides **(Group 11)** like Quadris, Flint, or Cabrio.

quinoxyfen (Quintec): 3 dh, REI 12 h, Group 13. Section 18 New York State, not registered in Massachusetts, but will make good rotational partner for Pristine and Nova. Do not make consecutive applications of Quintec.

trifloxystrobin (Flint): 0 dh, REI 12h, Group 11. Do not make more than one consecutive application. Mix with an effective protectant fungicide. Do not alternate with other **Group 11** fungicides like Quadris, Cabrio, or Pristine.

triflumizole (Procure): 0 dh, REI 12 h, Group 3

Protectants:

chlorothalonil (Bravo, Equus): 0 dh, REI 12 h, Group M5.

cupric hydroxide (Kocide 4.5 LF): 0 dh, REI 24 h, Group M1.

maneb (Maneb, Manex, Manzate, etc): 5 dh, REI 24 h, Group M3.

sulfur (Microthiol Disperss): 0 dh, REI 24 h, Group M1. Do not apply when temperatures exceed 90˚ F as plant injury may occur. Do not use on sulfur sensitive varieties.

References:

McGrath, M.T. 2006. Guidelines for Managing Cucurbit Powdery Mildew with Fungicides in 2006. http://www.vegetablemdonline.ppath.cornell.edu

McGrath, M.T. 1997. Powdery Mildew in Cucurbit Crops. http://www.vegetablemdonline.path.cornell.edu

CORN AND PEPPER REPORT

European corn borer: Trap counts are slowly climbing upward this week in some locations. Traps counts are very inconsistent throughout the Connecticut Valley; Hatfield pepper field at 66 and Hadley at 0 just a few miles away. These differences may be due to crop history in the surrounding fields and whether host crops have been grown or wild hosts are plentiful; they may be due to moisture and temperature (ECB seems to do well in areas with wetlands and fallow fields) but it is hard to pinpoint the exact reason for high or low counts in a given field. One thing we can be sure of is the importance of trapping on your own farm to get an accurate picture of what is happening there. Trap counts do reflect the moth pressure in a particular field. In the absence of other moths, ECB should be controlled with 6-7 day spray intervals on silk. We have seen small larvae in pretassel corn, though numbers are still low.

Pepper growers should be on a regular spray schedule if they are catching more than 7 moths per week. Insecticide applications should begin one week after trap counts reach 7 per week (or one per night). This week delay provides an ample time margin for mating, egg-laying and egg hatch to occur before the larvae can enter the fruit. During the period when ECB moths are active, a regular schedule of insecticide applications should be maintained. This flight period usually lasts through August. At the end of the flight, when trap captures drop below 20 per week, insecticides should no longer be needed.

Corn earworm: Trap captures remained low again this week with the exception of a few locations in central Massachusetts: Still River at 8 and Spencer at 6. We have recommended that some growers begin spraying on a 7 day schedule where trap counts have showed a flight of 0.3-0.5 per night. Shorter spray schedules would be recommended if captures were between 1.1 and 13 moths per night (see table below). Best to check traps at least twice weekly to know if new flights arrive and remember to keep your traps in fresh silk. The lack of strong storm fronts from the south have kept trap captures low but at some point we do expect to see the usual high numbers that exist in late season corn.

Fall armyworm: Traps captures are still at 0 throughout Massachusetts however, 1 moth was caught in Litchfield, NH this past week. FAW traps should be up by now so that the flight can be

detected as soon as it arrives. We are using the "PSU" FAW lure (produced by Scenty) that was developed at Penn State that has proven effective at attracting moths over the past few years. The lures should be used with a universal moth trap hung at the plant height in whorl stage corn. Lures should be replaced every two weeks and the use of an insecticidal vapor tape inside the bucket of the trap is recommended. All of these and other monitoring materials can be purchased from Great Lakes IPM, Inc. (989)268-5693 or online at www.greatlakesipm.com.

Sap beetle: Two species, the dusky sap beetle (all blackl) and the picnic beetle (yellow spots on black) are showing up in corn. Adults nibble on silks and the kernels at the tip. They also lay tiny eggs which hatch into nearly translucent larvae that have brown heads and grow to no more than ¼ inch long. These may not be noticed by customers. Sap beetles go after rotting fruit and vegetable tissue. If you have bird or caterpillar damage, sap beetles will move in. However, corn is not their first choice and not likely the place where populations build up. Every vegetable and

Sap beetle damage to kernel in the tip

fruit farm generates culls of all kinds, and these rotting veggies often end up in a pile in the back field or between the rows after each harvest. If these are not plowed under, they will become a breeding ground for sap beetles. (Note however, that if you are buying in vegetables it's wise NOT to bury the rotten throw-aways in your fields, since they may be a source of new diseases such as 'the dreaded' Phytophthora capsici.) Try to develop a system for incorporating culls into field soil or into an active composting operation on a regular basis.

Corn leaf aphids: These dark, blue green aphids are present in tassels, but we have not seen them building up in field scouted this week. We have noticed plentiful predators including twelve spotted ladybeetles, tiny black pirate bugs, and light green nabid bugs. (Note: 'ladybeetle' is the same as a ' ladybug'!) If you observe aphids, scout in a regular pattern as for ECB, to determine what proportion of tassels have aphids. Return in 5-7 days to see if the population is building up. It may take a few days for natural enemies to bring the numbers down.

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 day	3.5 - 7	5 days
1.0 - 13.0	7 - 91	4 days
Over 13	Over 91	3 days

Sweet Corn Trap counts for July 26, 2007

Location	ZI	EII	Total ECB	CEW
Sheffield	0	0	0	0
Pittsfield	0	0	0	0
South Deerfield	0	4	4	-
Deerfield	1	16	17	0
Granby	0	1	1	2
Whately	1	3	4	3
Hadley (2)	0	13	13	3
Hadley (1)	0	1	1	3
Easthampton	-	-	-	-
Amherst (1)	0	0	0	1
Amherst (2)	0	0	1	1
Sunderland	1	0	1	0
Rehoboth	-	-	-	-
Concord	9	0	9	0
Leicester/Spencer	0	0	0	6
Northbridge	0	2	2	2
Tyngsboro	0	0	0	1
Dracut	2	0	2	0
Lancaster	1	1	2	0
Still River	1	1	2	8
Mason, NH	2	0	2	2
Hollis, NH	1	0	1	2
Litchfield, NH	0	0	0	4

Pepper Trap Counts for July 26,2007

Location	ZI	EII	Total ECB
Hadley	0	0	0
Amherst	0	0	0
Hatfield	4	62	66

SPIDER MITE OUTBREAKS

The recent hot dry weather has contributed to flare-ups of two-spotted spider mite on melons, squash, beans, and other crops. Because mites are small, they are often overlooked in early stages of infestation. Mite damaged leaves first show white or yellow stippling, then as the infestation worsens the plants turn yellow, and in extreme cases plants can die. Infested leaves have webbing on the leaf undersides. Infestations often develop on the edge of fields particularly next to dusty roads. Pumpkins can tolerate moderate levels of mites, but watermelons are particularly sensitive to injury from mite feeding.

Mites have many natural enemies that kill them, but mite outbreaks occur when the natural enemies are not abundant, so that chemical intervention can be needed to keep the crop alive. Miticide choices vary somewhat by crop, as shown in the table below, but in general Agri-Mek is the most effective. Acramite and Oberon are other good alternatives. Although the pyrethroids Capture (bifenthrin) and Danitol (fenpropathrin) are labeled for spider mite control when used at the high end of the rate range, they are generally not very effective for mite control. Dimethoate, MSR, Kelthane, and Vydate are older products that are still effective for mite control at some sites, but do not perform well at sites where resistant mite populations have developed. With any of these products, a high volume of water (>25 gallons per acre) aids in control.

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