UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

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CROP CONDITIONS

Another hot humid week is upon us. Despite the inch of rain most of the state received on Saturday and Wednesday, irrigation equipment is out and running. Conditions are still very dry throughout the state. With good irrigation crops are doing very well. The dry conditions have enabled growers to cultivate, scout for insects and spray as needed. Harvesting continues of sweet corn, summer squash, zucchini, tomatoes, cucumbers, lettuce, beets, broccoli and cabbage growers are now beginning to pick peppers and potatoes.

Insect pressure in many crops has been high. Leaf hoppers, flea beetles, potato beetle, aphids, onion thrips and caterpillars in brassica crops are multiplying rapidly and causing lots of damage. This is a good time to take a few minutes to closely inspect your crops for insect damage.

Cucurbit downy mildew is inching closer, with much of NJ at moderate to high risk for infection. The forecast for MA remains low risk, but it's wise to start applying protectant fungicides if you're not already doing so. As soon as downy mildew is found in our area, or our forecasted risk increases, begin including downy mildew specific materials in your spray rotation.

The continued hot and relatively dry weather is helping to keep the late blight in check. We have had no new reports of late blight outbreaks over the past week. The rain and humidity much of the state experienced over the last week did lead to the accumulation of high severity values in some areas; see the late blight page at www.umassvegetable.org for details.

TRACEBACK AND MOCK RECALLS

Food safety involves a variety of issues including worker hygiene, water quality, wildlife/livestock, manure and compost, general farm sanitation, and traceback. We will address each of these issues over the summer to help provide some insight on what potential food safety requirements might look like. Please direct any questions to Rich Bonanno at rbonanno@umext.umass.edu. The following article addresses traceback.

There have been several questions concerning how to implement a traceback program for food safety. Whether you go through a USDA GAP/GHP, SQF, BRC, etc. audit, all require some type of traceback program in place. There are many different ways to develop a traceability program. Below is a simple system for those who are just starting out.

Traceability

Traceback is the ability to track food items, including fresh produce, back to their original source. This cannot prevent an initial food borne outbreak, but it may help speed up the process to pinpoint the source. The faster the source is located, the faster the rest of the produce industry can get back to normal. Hopefully, this will help ensure that the public will have greater confidence in the produce industry.

A written procedure must be included in the Grower Food Safety Plan on how the farm will track individual containers one-step forward and one-step back. Maintain as many detailed records as possible including the harvesting dates, specific field and product location within the field or orchard, number of packages within a lot, packing and shipping date and harvesting crew. Each container must contain some type of identification to maintain its integrity throughout the harvest-

ing and marketing process. The label on the box generally is sufficient to trace the product to the farm or packing house, but each wholesale box must have a harvest/packing date stamp or code with the date incorporated on the box. Placing a label on the wrapped pallet will not meet this standard. If packing in more than one shed or packing under someone else's label, additional identification is needed to trace the product back to the packinghouse. A hand-labeling gun can be used to code each box where a series of numbers can identify the container. For example – 16556169:

165 = (date harvested) this could be the first day a grower picked or the Julian calendar date such as 165 for June 14 or use the calendar date 614. This reserves the first 3 digits numbers for dates.

5 = (grower)

6 = (field picked or picker)

169 = (packing date)

The other numbers can be used for more information or be zeros. At the end of each packing day, record the beginning and ending numbers in a book or computer. The code for these numbers needs to be recorded once and filed. The code is to assist the grower if there is a question about a shipment.

Mock Recall

Recall procedures must be included in the Grower Food Safety Plan. To ensure the system works properly mock recalls should be scheduled at least once during the production season or every six months if shipping year round. The operation must document the customer contacted, the amount of product remaining from the original shipment and the disposition of product which could not effectively be recalled. This may include sales to customers or reshipment to other customers who could be contacted if necessary. Have the customer fax a copy of the confirmation on their letterhead. It should include the date, how much product they received, how much is still on hand and where the remaining product was shipped. Auditors will review the traceback procedures and reports from the mock recall.

Note: this does not mean you take control of the product. The auditors want to see if you have the ability to take control if a recall is requested!

- Article by Wes Kline, introduction by A. Rich Bonanno

DOES SPRAYING FOR APHIDS CONTROL VIRUS? WHEN SHOULD I SPRAY FOR APHIDS?

At this point in the season, aphids are showing up in many crops, and growers are concerned about whether and when to spray. Many growers feel they must have a rigorous spraying program for aphids to protect their crops from virus diseases. All too often this practice is not effective in preventing the occurrence of virus diseases, but it is expensive and time consuming.

This article will briefly review some of the basics of how viruses are spread. Virus diseases require a living host, and when the host plant dies, any virus within the host plant cannot survive. (An exception is tomato/tobacco mosaic, which can survive in dead host tissue.) For the most part, viruses survive the winter in certain perennial weeds. During the growing season, viruses can be transmitted from perennials to a susceptible vegetable crop.

Most vegetable virus diseases that are important in New England are spread by insects. Cucumber beetles, thrips, leafhoppers, and nematodes can spread certain viruses, but aphids are the most important vectors (carriers). Viruses can be classified as persistent and nonpersistent. This is related to the manner in which they are spread by insects and is important in choosing an appropriate management strategy.

An insect must feed for a minimum of ten minutes to an hour to pick up a persistent virus from an infected host. The virus must then undergo a dormant period of at least 12 hours within the insect before it can be transmitted to another plant. Aphids will remain infective (able to vector a virus) for at least a week and maybe throughout their life. A good insect management program including pesticides can be very helpful in dealing with persistent virus diseases; however, the viruses most likely to affect cucurbit crops in out area are NON-persistant viruses.

Aphids pick up nonpersistent viruses by merely probing (exploring) an infected leaf. This happens rapidly--within sec-

onds or minutes. A dormant period is not required and the aphid can immediately transmit the virus by probing another plant. Aphids remain infective with nonpersistent viruses for a short time (minutes).

Winged aphid stop on many types of plants and probe to determine if the plant is the 'right one' for them – if it is their host plant. If it does not 'taste right', they will fly away. During the few seconds it tastes the plant, any viruses that it is carrying can be transferred. No insecticide works fast enough to prevent this transmission. Insecticides do not prevent virus transmission in most vegetables and any application of insecticides to prevent viruses does more harm than good by killing natural enemies.

For situations where aphid populations need to be controlled because of the level of direct damage caused by the insects, systemic materials are generally the most effective insecticides available for aphid control. Systemic insecticides are taken into the plant and become present in the plant juices. Aphids feed by sucking juices from the plant, and when they do so they also ingest some of the insecticide. However, when probing a leaf an aphid is not feeding and does not ingest plant juices or insecticide. In fact, the presence of an insecticide may actually stimulate probing and cause aphids to move from plant to plant in an effort to fine a suitable feeding site. This can increase the spread of nonpersistent viruses.

Nonpersistent viruses are very difficult to manage. We have no pesticide that kills viruses and, as we have seen, insecticides may actually make matters worse. Eradication of perennial weeds around fields can reduce the source of the virus. The green peach aphid is not the only aphid that transmits viruses, but it is important because it is a universal vector. Prunus species (peaches, cherries etc) are attractive to green peach aphids. Removal of wild prunus such as wild cherry trees from around fields can make the area less attractive to green peach aphids.

Reflective mulch such as aluminum foil on paper have been used successfully to repel aphids and can be effective in reducing virus problems. However this material is expensive and tears easily when laying. Some of the light colored plastic mulches may be worth a try. Row covers such as Remay can keep aphids off a crop, but they are generally used during the cool days of spring whereas aphids are most active during warm weather.

Resistant varieties. The most effective way to reduce the incidence of viruses is to plant virus resistant varieties, wherever possible. Managing weeds in and around vegetable fields will also help reduce aphid populations.

Direct damage from aphids: Besides spreading virus diseases, aphids in high numbers can cause economic damage by their feeding activities. Leaf curling and yellowing or deposits of honeydew on leaves or fruit can affect crop quality or yield. For this reason it is important to manage aphids even if virus is not a concern. However, beneficial insects such as ladybeetles, lacewings, and parasitic wasps often keep numbers low enough to prevent direct damage. Beneficials move in shortly after aphids arrive, and bring the population down. Early sprays targeting aphids may actually result in further aphid outbreaks, because the natural enemies that keep them in check have been killed. Where possible, use selective insecticides that have minimal impact on beneficials.

Scouting across the field gives you an estimate of current numbers. If aphids are present, check back in a few days to see if the numbers are increasing or decreasing. Note which natural enemies are present. Check undersides of leaves, including lower and mid level leaves. Keep in mind that spraying for aphids may actually increase your virus problems, though it may be necessary if aphid populations are high enough. The following thresholds can be used to determine if insecticides are needed (sampling routine in parenthesis):

Pumpkin and winter squash: 20% of leaves have more than 10 aphids (based on 50 leaves).

Pepper: 10 per leaf (based on 4 leaves per plant, 25 plants).

Tomato: 6 per leaf (based on 2 leaves per plant, 25 plants).

Potato: 4 to 10 per leaf (based on 25-50 compound leaves; higher threshold near harvest).

Sweet corn: 50% of plants with >50 aphids at emerging tassel (based on 100 plants).

-- Ruth Hazzard, John Howell, and Rob Wick, University of Mass., with except from Beth Bishop, Michigan State

Harvesting garlic

Everyone knows the balancing act that is garlic harvesting - too early and the cloves are small and don't store well, too late and the head pops, making it unmarketable and more susceptible to diseases. So, as we near harvest, how should a grower decide if the garlic is ready? The best answer we have is to pull a few plants, cut through the head sideways (so you cut through all the cloves), and see how well developed the cloves are. You can use the leaves as a guide to decide when to do this (lowest third or half of the leaves yellowing and dying is a good mark to start with), but looking at the cloves is the best way to know if the garlic is ready. Cloves should fill the wrappers - if they seem a little loose, the garlic has a little ways to grow. A little of the very outer wrapper may have started to discolor at this point. That is okay - it's a normal part of the maturation process.

The key is to harvest before the bulbs pop, which can happen relatively quickly, especially in a wet year. If you don't think you will be able to get out and harvest for a period of time, it's better to harvest bulbs a little too early than a little too late.

To wash or not to wash? Generally, you want to clean your garlic in the most gentle way possible. For some soils this can be done dry, for others washing is necessary. Garlic harvested from sandy soils may be brushed clean, while garlic harvested from wet soils and heavy soils under any conditions probably needs to be washed. The quicker you can move from harvesting to washing, the better. Do not bang heads to remove dirt, gently remove excess and then wash off the dirt that clings to cloves. The more garlic is banged during the process, the more it will bruise and the worse it will store.

After cleaning, curing garlic is the step that assures good storage ability. Cure garlic hanging in small (5-7 heads) bunches, with some space between, out of direct light with roots and tops on. Many people use barn rafters. The ideal temperature range for curing garlic is 75 to 90 degrees F. We would like humidity to be 60-75%, but since we can't control it in most operations, just bear in mind that the higher the RH, the slower the drying time. If you can use fans to reduce humidity in the structure you are using to dry garlic, that can help. If humidity is very high outside (it's raining), the fans are not useful. Curing may take up to two weeks. The goal is to have the neck dry, nice and tight, which will help keep diseases out of the head.

- Sources: Knott's Handbook for Vegetable Growers, 5th Ed. Maynard and Hochmuth, 2007. Garlic: Organic Production. ATTRA 2008, by Crystal Stewart, Capital District Vegetable & Small Fruit Program; reprinted from July 1 Veg-Edge, July 1 2010

Plectosporium blight of cucurbits

Lesions on fruit are often more rounded than lesions occuring on stem tissue

Plectoporium blight (Microdochium blight) caused by *Plectosporium tabacinum* (*Microdochium tabacinum*) was first observed in Tennessee in 1988 and has since been reported throughout pumpkin growing regions of the United States. The most susceptible cucurbits to Plectosporium blight are pumpkin, yellow squash, and zucchini.

Plectosporium tabacinum is a common fungus in the soil and on decaying plant material and is favored by warm, wet weather. The spores are spread by rain-splash and wind. Plectosporium blight is known to cause damage to a variety of cucurbit crops in Europe and Asia, but the strain present in the U.S. seems to primarily damage pumpkins, summer squash, zucchini and a few varieties of gourds. More recently it has shown up on *Cucurbita moschata* (butternut family) and *Cucurbita maxima* (Hubbards, buttercup, giant pumpkins, etc), so it is possible that the US strains are jumping species and will become a threat to previously immune crops. In wet years, which favor disease development and spread, crop losses in no-spray and low-spray fields can range from 50 to 100%. Fortunately, this disease is easily recognized and can be effectively managed.

Characteristic lens or diamond shaped lesions caused by Plectosporium blight

Description and Management

Pumkin handle disfigured by Plectosporium blight

Lesions are small (<1/4 inch) and white. On vines, petioles and leaf veins, the lesions tend to be diamond to lens-shaped; on fruit and leaves lesions are usually round. The lesions increase in number and coalesce until most of the vines and leaf petioles turn white and the foliage dies. Severely infected vines become brittle and will shatter if stepped on. Early in the infection cycle, foliage tends to collapse in a circular pattern before damage becomes more universal throughout the field. These circular patterns can be easily detected when viewing an infected field from a distance. Numerous fruit lesions produce a white russeting on the surface and stems that render the fruit unmarketable. To scout for Plectosporium early in the season, part the leaves of the canopy and look at the main large vine of the plant that runs along the ground-that is where Plectosporium tends to show up first. Plectosporium blight is favored by warm, rainy weather. The fungus can overwinter on crop residue and can persist in the soil for several years. Plectosporium has not been reported to be seed-borne. Tiny spores are formed in lesions on vines, stems, fruit, leaves and leaf petioles. Spores can be dispersed by wind over long distances.

Important Things to Remember:

- When Plectosporium blight occurs, rotate away from summer squash and pumpkins for two years.
- Choose sunny, well drained sites for cucurbit production.
- No resistant cultivars of pumpkins have been reported.
- Scout for disease early and apply protectant fungicides when the disease first occurs. The disease is readily controlled by fungicide applications. Thorough coverage of foliage, vines, and fruit is necessary for good control.
- Always rotate strobilurin applications with chlorothalonil to prevent resistance development in the pathogen population.

Plectosporium blight on leaf petioles and vines

Chemical Controls

- azoxystrobin (Quadris): 11.0 to 15.5 fl oz/A (1 dh, REI 4 h, Group 11). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Cabrio.
- chlorothalonil (Bravo Weather Stik): 1.0-2.0 pt/A (0 dh, REI 12 h, Group M5). Apply when conditions are favorable for disease development. Repeat no sooner than a 7 day interval. Do not apply more than 19.1 lb/A per growing season.
- pyraclostobin (Cabrio EG 20 %): 12 to 16 oz/A (0 dh, REI 12 h, Group 11). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Quadris.

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.

-- T. Jude Boucher, University of Connecticut, Cooperative Extension System, M. Bess Dicklow, UMass Extension, compiled by Andrew Cavanagh, UMass Extension

FLEA BEETLES: PLANT LATE BRASSICAS FAR FROM SPRING CROPS.

Mid July is often a time of year when adult Flea Beetle numbers decline, because a large part of the population is underground, in larval and pupal stages. After larvae feed on roots, they pupate in the soil, then emerge again into the light as adults - ready to feed on foliage. The time when you will first see these new adults depends on when eggs were first laid

on spring Brassica crops, and on soil temperatures since then.

In fields where Brassica crops are always present, because succession crops are planted close together, it may appear that flea beetles never go away all summer. In fact, they are likely to increase dramatically and feed heavily in early August because of the new summer adults. If you plant fall brassicas close to your spring crops, you make it easy for these beetles to find food. Fall broccoli, cabbage, kale as well as greens such as arugula, bok choi, nappa and salad mix can get heavily damage or even killed by flea beetle feeding. However if you manage your plantings so that fall brassicas are in a different, separated field than spring crops, you can significantly reduce your problems in fall crops. How far? As far as possible, but any distance helps. Barriers such as forests, streams, roads, and houses, are helpful. Shorter distances delay the arrival, longer distances delay and reduce the population enough to reduce or eliminate the need for row covers or sprays.

Use of Komastuna as a trap crop around the waxy type of brassicas (broccoli, kale, collard, cabbage, etc) may reduce invasion of late crops by flea beetle. The whole perimeter is planted to one or two rows of komatsuna (or another Brassica rapa crop, which are highly attractive). On an organic farm, the border can be sprayed with Entrust. This is best combined with field rotation to reduce the pressure and can help prevent the need for sprays on the main crop.

SWEET CORN REPORT

Corn Earworm Threshold		
Moths/Night	Moths/Week	Spray Interval
0-0.2	0-1.4	no spray
0.3-0.5	1.5-3.5	every 6 days
0.6-1	3.6-7	every 5 days
1.1-13.0	7.1-91	every 4 days
Over 13	Over 91	every 3 days

Harvesting of delicious sweet corn continues throughout the state. Transplanted corn is now being picked and harvesting of first plantings of plastic corn is coming to an end in some locations. Most retail stands are selling out of their daily pick and getting anywhere from 5-6 dollars a dozen. This has been a good season for sweet corn. The spring weather cooperated well for planting and hot temperatures in late spring and early summer pushed growth enabling an early harvest. Despite the lack of rain ears are full and kernels are plump and sweet. European corn borer pest pressure seems to be down and corn earworm has yet to make an appearance.

Location	ZI	EII	Total ECB	CEW
CT Valley				
Sunderland	2	4	6	0
Central & Eastern MA				
Still River	0	1	1	6
Rehoboth	0	15	15	0

It still appears that we are in between ECB flights and trap captures remain low. *Trichogramma ostrinea* releases began this week in pepper and Indian corn fields that have a history of ECB infestation in anticipation of the second flight beginning soon. The action threshold at pre-tassel and green tassel in 15% or more of plants have one or more ECB caterpillars or showing fresh feeding damage. No fields at this stage were reported to be above this action threshold however it is still good to scout to make sure. Repeat scouting in four to seven days if scouting shows infestation is still above threshold. If more than 50% of your field is infested two sprays four to five days apart may be necessary to bring infestation levels below threshold. Since trap captures for ECB remained below 12 moths per week, no sprays were recommended for ECB in silking corn. If your corn is more than one week away from harvest and trap ECB captures are greater than 12 moths per week, spray weekly targeting the ear zone.

You may be finding another pest of sweet corn, sap beetle, in fields where ECB was initially a problem. Sap beetles are usually secondary pests of sweet corn and are commonly associated with damage cause by other pests. Sap beetles overwinter as adults or pupae in crop debris and lay eggs in the spring. There are several generations per year and are more likely found on farms that produce a variety of vegetable and fruit crops. Two types to look for are the Dusky sap beetle and the four spotted sap beetle. Dusky sap beetles are black and about 3/16 of an inch long, the four spotted sap beetle has four yellow irregular spots and is about ¼ inch long. Adults may invade corn borer tunnels or other insect damage feeding. Adults will feed on pollen and silks and lay milky white eggs resembling tiny grains of rice in these locations. Larvae are small pinkish white grubs about ¼ inch long that may hollow out kernels in the upper half of the ear.

Sample for sap beetles when silks start to wilt. Inspect the silk area at the tip of 20 ears at each of five separate sites within the field to determine the percent infested with adults eggs or larvae. Sprays for other pests usually take care of sap beetles but if other pests are absent and more than 10% of ears are infested, treat for spa beetles. Sanitation is important to prevent successful overwintering of this pest. If sap beetle is an annual problem on your farm bury corn residue especially decomposing ears or nearby rotting fruit or vegetables. Sweet corn varieties with long tight husks and good tip coverage are more resistant to sap beetle damage in the ears.

Corn ear worm moths showed up in a couple almost every part of the state this week. Some growers are on a 4-5 day schedule for CEW. Remember to move traps to fields with fresh silk and to change the lures every other week. Refer to the spray schedule below if you are catching moths on your farm. At 2 or more moths per weeks, you should be on a 6 day spray schedule for silking corn. An alternative corn earworm control method is direct silk treatment. This method is especially useful for farms who grow certified organic corn, do not own a sprayer or grow a relatively small amount of sweet corn. Next weeks Veg Notes will include an article on direct silk treatment methods, equipment and efficacy.

Fall armyworm caterpillars have been seen in whorl stage corn in Essex County along the coast despite no trap counts. Keep an eye on your fields and chose a material such as Radiant, Avaunt, or Coragen for best control of CEW.

UPCOMING MEETINGS

MNLA/MFGA Great Ideas Summer Conference and Trade Show

July 21

www.progrownews.com or www.umassgreeninfo.org; Tina Smith 413-545-5306

New Crops, New Systems - Field Day at the UMass Crops Research and Education Farm

89-91, River Rd, South Deerfield, MA

Wednesday August 11, 2010

Vegetable, Field and Energy Crops

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NOFA-MA 36th Annual Summer Conference

August 13-15, 2010

University of Massachusetts, Amherst

Over 200 workshops on organic farming, gardening, land care, sustainability and homesteading.

To register visit www.nofasummerconference.org. For more information contact the NOFA Summer Conference office at (978) 355-2853 or info@nofasummerconference.org.

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