Weekly Update

Berry Production Q & A

When should I start looking out for tarnished plant bugs? Tarnished plant bug should be monitored while plants are in bloom. Adults overwinter in leaf litter and debris, and move to crops such as strawberry to lay eggs. Populations will be highest in weedy fields or those next to hedgerows. The eggs hatch in 10 days and develop into small green nymphs that resemble aphids but move much faster than aphids. It can take 12-34 days (depending on weather) for the nymphs to move through their 5 instars, and as they do they get darker in color.

Both adults and nymphs cause injury, but nymphs cause the majority of the damage as they feed on seeds or the tissue near seeds. The hormones produced by the seed which encourage fruit swell are then disrupted, causing the “cat-facing” or “button berry” condition. The earlier the feeding by tarnished plant bug occurs, the more severe the damage is.

Monitor for tarnished plant bug now until harvest. Strike the berry cluster over the top of a light colored pan or paper plate. If you check 15 clusters and 4 or more clusters have 1 or more nymphs, then you should spray for tarnished plant bugs.

Spray materials include Pyganic 1.4EC, Malathion 57 EC, Dibrom 8EC, Brigade WSB and Assail SG among others.

Should growers worry that fertilizer is leaching out of blueberry root zone due to exceptional rainfall? Ammonium sources of N that are used in blueberries (ammonium sulfate and urea) do not leach as badly so re-application is not necessary. Nitrogen application should be split anyway to allow blueberry roots to adequately pick up the nutrients. The second application should be in early – mid June. Fertilizer rates vary according to age of plant – check the Cornell Guidelines for more exact information. [http://ipmguidelines.org/BerryCrops/default.asp](http://ipmguidelines.org/BerryCrops/default.asp).

What might be the best way to approach fungicide applications for strawberries since it has been very difficult to get anything down so far this spring? Constant rain may actually help knock off spores, but still if weather ever clears, be prepared to get right out there with a sprayer. This will be especially important if weather gets warm (as it is) because of anthracnose and botrytis pressure. Spore release can happen in just a few hours.

(Continued on page 5)
Managing diseases in high tunnels

Greater ability to manipulate the environment around a crop grown in a high tunnel than in the field means cultural practices to avoid conditions favorable for disease are of much greater importance and should be the foundation of all disease management programs. Most pathogens affecting leaves and fruit need this tissue to be wet or the humidity to be high (at least 90%) for several hours in order to infect. Trellising plants (e.g. tomatoes) and using drip irrigation are important practices used in both high tunnels and the field. Other practices: Locate and orient high tunnels such that they will receive good sunlight and air movement. An east to west orientation, perpendicular to prevailing winds, and away from shade of trees or buildings is ideal. Cover the ground with plastic mulch which raises temperature and prevents evaporation of soil moisture. Minimize humidity by using wide row and plant spacing (extremely important), fans, open sides (early and late in day), orient rows to air movement, irrigate with drip, and prune old leaves and dead tissue.

The main diseases occurring in high tunnels are different from those occurring in the field because of the difference in environment. For example, leaf mold, gray mold, powdery mildew, and pith necrosis are more likely to occur on tomatoes in high tunnels.

Fungicides labeled for use to manage a disease occurring on field-grown plants may not be permitted for this use in a high tunnel. Check the label for a statement prohibiting use in a greenhouse or restricting uses. Some products are not labeled for the same uses in greenhouse and field. If there is no statement about greenhouse use, then the product can be used. In NY a high tunnel is considered the same as a greenhouse with regard to pesticide regulations. A few states it is not if the sides are rolled up at the time of the application, an important fact to remember when reading fungicide recommendations from other states. Products with statements permitting use greenhouse or high tunnel include coppers and Dithane. Some copper fungicides have information on rates to use in greenhouse. Products that cannot be used include Bravo, Forum, Quadris, Presidio, and Ranman. Products with no information about greenhouse use which thus can be used include Curzate, Tanos, phosphorous acid fungicides, Revus, and Revus Top. Previcur Flex has a section on Greenhouse Use which includes only root rot and damping-off caused by Pythium and Phytophthora.

Additional information on diseases in high tunnels is on the web at http://glvwg.ag.ohio-state.edu/projects.php#seasonextension and http://vegetablemdonline.ppath.cornell.edu/NewsArticles/HighTunn.htm. By Meg McGrath

Weed control in sweet potatoes: the Long Island Perspective

Although we don’t have research experience with herbicides for sweet potatoes, there are three herbicides available for residual weed control in this crop that growers are familiar with which can be used legally on Long Island.

Command 3ME (clomazone) can be applied as pre or post-transplant (1.3 pts. /A) to freshly prepared soil. New Jersey recommends a post transplant, but pre emergence to the weeds application. Command provides good control of most grasses and many broadleaf weeds, except pigweed and carpetweed.

Devrinol (napropamide) can be applied pre or post transplant, but pre emergence to the weeds. Both Command and Devrinol should be incorporated soon after application for optimal weed control.

Valor (flumioxazin). Valor is the field crop trade name for flumioxazin. It is also sold as Chateau and Sureguard for other crops. Valor should be applied to freshly prepared beds 2-5 days before transplanting. Our experience with other crops and this herbicide suggests that transplants be well watered and turgid at planting to prevent the leaves from drooping onto the treated soil, which may cause injury.

It is important that Valor is not disturbed by cultivation after application because that will reduce weed control with this herbicide.

If grassy weeds begin to escape later in the season, postemergence grass herbicides such as sethoxydim (Poast and other names) can be used to manage them.

-By Andy Senesac
Effect of transplant age on yield

Elsa Sánchez, Penn State Horticulture, esanchez@psu.edu
Source: Penn State Vegetable and Small Fruit Gazette, Volume 15, Issue 6, 2011

This has been one wet and cool spring. For many, planting has been delayed because fields are too wet. I thought I’d rerun this article on how transplant age affects yield of bell peppers, tomatoes and summer squash.

Bell Peppers
In one study (Weston, 1988) transplants were 30, 40, 50 or 60 days old (about 4.3 to 8.5 weeks old) when field planted. At the end of the growing season yield was not different, regardless of the age of the transplant; however, the 60-day-old transplants (about 8.5 weeks old) produced larger early yields that the other transplants.

In another study (McCraw and Greig, 1986) 11- and 8-week-old transplants of 4 cultivars were field planted. The 11-week-old transplants were 12 inches tall with open flowers and small fruit while the 8-week-old transplants were 6 inches tall without flowers or fruit. Flowers and fruit on the 11-week-old transplants were either left on the plant or pinched off. The 8-week-old plants were left alone or the growing tip was pinched off to stimulate growth.

In the first year of the 2 year study, yield was not affected by any of the treatments. In the second year, the 11-week-old transplants on which flowers and fruit had been pinched off, produced the highest early yield, but yields from the 8-week-old transplants with the growing tip pinched produced the greatest number of large fruit. The conclusion was that while cultivar played a role, 11-week-old transplants generally produce more, but smaller fruit than 8-week-old transplants, regardless of whether pinching was used.

Tomatoes A very nice review of tomato transplant age was published by Charles Vavrina and our very own Mike Orzolek (1993). They looked at over 60 years of research on tomato transplant age in their article.

They determined that overall yield really depends on cultivar, environment and the management techniques used. Because of that, transplants of 2 to 13 weeks old can produce similar yields. As for early yields, they were larger with older transplants.

Even though a 2-week-old transplant generally ends up producing comparable season long yields to a 13-week-old transplant, removing a young transplant from its cell can be difficult because the root system is not extensive enough to hold the container soil which is a problem. On the other hand, it costs more to produce an older transplant and older transplants have a higher possibility of exposure to disease and/or insect problems in the greenhouse.

Conclusions were (for tomatoes) to use a transplant in the 4- to 7-week-old range so that removing the transplant from its cell is not difficult and transplant production costs are not too high. Also, hold onto any extra transplants. They can be used to replace any in the field that have died and their age should not greatly affect yield.

Summer squash
In a study on summer squash (NeSmith, 1993) 2 cultivars of 10- to 30-day-old transplants (about 1.4 to 4.3 weeks old) were field planted. Some differences between cultivar were observed. In general the age of the transplants affected growth and establishment; however, total yields were not different based on transplant age. Early yield was also not affected by transplant age.

The researcher also mentioned the difficulty of removing young transplants from cells. A 21-day-old transplant was recommended because in the event that it could not be planted right away, it could keep for at least about 10 more days without compromising yields.

Overall for these crops
Some themes are evident from these studies:

1. Different cultivars respond differently to transplant age.
2. Environmental conditions and management practices play a large role in how the plant performs.
3. Yields can be comparable over a wide range of transplant ages.
4. Young transplants can be difficult to remove from cell packs.
5. Older transplants cost more to produce than younger transplants.
6. For bell peppers and tomatoes, older transplants result in earlier yields than young ones.

Suggestions for transplant age reflect what is found in the literature. They are generally mid-ranges accounting for the difficulty of removing young transplants from cells and minimizing production costs for producing older transplants. One suggestion is to aim for the lower end of the range. That way, in the event that it is not possible to transplant when planned, plants can still be field planted for several days without yield being affected. The suggested age ranges of transplants for ideal growth are 8-10 weeks for bell pepper, 6-8 weeks for tomato and 2-3 weeks for squash.
It’s disappointing to discover that your high-value early spinach and chard leaves are showing ugly feeding mines just as they are ready for harvest. Spinach leaf miner, typically an early-season pest, is likely to be active now and may cause damage to early greens. It attacks crops and weeds in the plant family Chenopodiaceae which includes the crops chard, beets, and spinach as well as weeds like lamb’s quarters and pigweed. Leafminer is a fly larva that burrows between the layers of a leaf eating everything but the epidermis. Early damage is a slender, winding ‘mine’ or tunnel, but later these expand and become blotches on the leaves. Inside the mine is a pale, white maggot.

The fly overwinters as pupae in the soil and hatches in late April and May. The adult fly then lays eggs on the leaves and the resulting larvae begin their damage. The oblong white eggs, less than 1 mm long, are laid in neat clusters on the underside of the leaves. They are easy to spot if you scout by looking under the leaves. The maggots may migrate from leaf to leaf down a row. They become fully grown in just a few weeks and drop into the soil to pupate. The entire life cycle is 30-40 days. There are three to four generations per season. Typically mid-late May, late June and mid August are peak activity periods.

Late blight in 2011: Expect and participate in national reporting system

A couple unexpected finds of late blight on tomato in greenhouses in the northeast during April plus detections in seed potatoes expose an unfortunate but important fact – everyone growing tomatoes and potatoes in 2011 needs to expect and thus prepare for late blight occurrence in their plants. Preparing is critical since late blight is a top contender for most difficult disease to manage when started after detection.

The unsolved nature of the outbreaks this spring, as well as some outbreaks in 2010, reveals there is clearly a need to obtain a better understanding of the sources of the pathogen, especially for early season outbreaks. Knowledge of the sources will lead to targeted management practices and minimize the potential for growers being caught off guard. This can be accomplished through growers and researchers investigating occurrences together. Fortunately, the resources are now available to a team of researchers at 17 institutions to do this work as part of a national project with funding from the USDA. This project will also address other aspects of late blight and its management during the next five years. These include systems for helping growers make management decisions, methods for identifying pathogen strains and their traits, and plant varieties that are more resistant.

There is also a need to know where late blight occurs throughout the growing season in order to study movement of the pathogen and develop a predictive system to enable growers to be more informed about potential outbreaks in the future. Thus it is important to report all occurrences. Success of this late blight project is dependent on growers participating in the National Reporting System.
Try to rotate chemicals – one option would be a Captan/Switch tank mix followed by Pristine, but maybe start with Pristine first as it offers a bit of kick-back activity and if you cannot get out to spray that might provide a bit of protection. (Anthracnose could also be a problem for blueberries, so getting a cover spray on them would be helpful).

Is there any way to know before fruit set if your pollination (in blueberries) has been acceptable? First remember that bumble bees and other native pollinators that blueberries really depend on are MUCH harder flyers than are honeybees. Then, look at the blueberry corollas as they fall off the plant. If the corolla’s are white, then pollination has occurred. If the corolla is a purple-brown color then pollination has not happened. This kind of information prior to fruit set might help the grower decide if she wanted to apply gibberellins to improve fruit size. The following paragraph, written by Dr. Eric Hanson of Michigan State University, details this strategy and more information is available on the MSU website: http://www.ipmnews.msu.edu/fruit/Fruit/tabid/123/articleType/ArticleView/articleId/905/Manipulating-blueberries-with-Gibberellin.aspx.

When pollination is limited by poor weather, gibberellin (GA) sometimes improves percentage set and berry size. Several GA products (ProGibb, GibGro) are labeled for highbush blueberries. GA may result in retention of some seedless (parthenocarpic) fruit that normally drop, and increases the size of berries with low seed numbers. GA can be applied in a single spray during bloom (80 gram active ingredient per acre) or two 40 g sprays, one during bloom and the second 10-14 days later. Higher spray volumes (40 to 100 gallons per acre) may improve coverage and effects. Slow-drying conditions also increase absorption. Also make sure your spray water pH is not above 7.5. –LGM

(Continued from page 1)

Routinely inspect plants for symptoms beginning at the start of production. Plants in high tunnels and greenhouses are now recognized to be vulnerable rather than fully protected. If you think you may have late blight, contact your local Extension office for verification of the diagnosis and submission of a sample to the national research team. Information on how to sample is under ‘Reporting Outbreaks’ at the project web site (http://usablight.org/). You can stay informed about occurrences of late blight to gauge the potential threat to your crop by checking reports at the project web site.

Some early-season outbreaks of late blight in tomato have raised concern that the new pathogen genotypes may have another means to survive between crops over winter in the north other than the only known means, which is in potato tubers. This concern was heightened following a recent report of late blight on volunteer tomatoes in a greenhouse. Potatoes were in the vicinity of other outbreaks; however, if the source was an infested tuber, it remained elusive even when extensive searching was done. This might reflect the fact a tomato genotype of the late blight pathogen being less aggressive on potato consequently does not produce as distinctive symptoms characteristic of a tuber infection. Without knowledge of the sources for the early-season outbreaks of late blight in tomato, there is concern that they will continue to occur, as we cannot effectively manage what we do not understand. By Meg McGrath

Websites of Interest

- Diagnose pest and disease problems using color pictures: http://vegetablemdonline.ppath.cornell.edu/
- Cornell Guidelines for fruit and vegetables: http://www.nysaes.cornell.edu/recommends/
- Cucurbit Downy Mildew forecast: http://www.ces.ncsu.edu/depts/pp/cucurbit/
- USDA Fruit and Vegetable Market News: www.marketnews.usda.gov/portal/fv
The planting of our warm season crops is well under way now that the good weather is with us, and I suspect that many of you are getting ready to fertigate your crops. It is all too common that excessive fertilizer is applied under plastic mulches when using fertigation systems. It is very important to remember that when calculating rates for plastic mulched crops, only the area covered by the plastic is used for determining the fertilizer rates. If the top of your bed is 3 feet wide, you would take that width and multiply it by the length times the number of beds divided by 43,560 (one acre). So, 15 beds x 3’ wide per bed x 300’ long beds = 13,500 square feet. To determine the acreage take 13,500/43,560 = 0.31 acres.

Now let’s say you want to supply 15 lbs of actual nitrogen per acre to these 15 rows and your nitrogen fertilizer analysis is 20-0-0. To get 15 lbs actual nitrogen per acre, you take, “what you need over what you’ve got” which would be 15 lbs actual N divided by 0.20 (fertilizer analysis expressed as a decimal). So the total amount of this material that would be used is 75 lbs per acre. **But**, remember that this is what you would apply to an entire acre and your 15 beds are actually only 0.31 acres so the actual amount of 20-0-0 fertilizer you would measure out is 23.0 lbs (75 lbs 20-0-0 x 0.31 acres). If you need help figuring the amount of fertilizer you need to apply, call Chuck at 859-6213.

### Determining fertilizer rates for fertigation systems

### Growing Degree Information Base 50°F

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**NA¹**—The Granville weather station was established this year (2011) so there will be no 2010 data reported as we have no records.