VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the Purdue University Cooperative Extension Service

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IN THIS ISSUE

Aphids in High Tunnels - (*Rick Foster, **fosterre@purdue.edu**, 765-494-9572*) - I have seen some massive outbreaks of aphids in high tunnels, including ours at the Meigs Farm just south of campus. In our case, we had large numbers of natural enemies such as lady beetles and their larvae, but even so they could not contain the aphid population (see Figures 1 - 4). We applied Assail® and got excellent control. Assail® is one of a few effective aphid insecticides that can be used in high tunnels. See the table on page 40 of the *Midwest Vegetable Production Guide* (*ID-56*) for the insecticides that you can use in high tunnels.

Figure 1. Aphid and honeydew encrusted cucumber leaves. (*Photo by John Obermeyer*)

Figure 2. Lower cucumber leaves severely damaged from aphid feeding. (*Photo by John Obermeyer*)

Figure 3. Heavily infested underside of cucumber leaf. (*Photo by John Obermeyer*)

Figure 4. Lady beetle larvae feeding feverishly. (*Photo by John Obermeyer*)

Corn Earworm - (*Rick Foster, **fosterre@purdue.edu**, 765-494-9572*) - So far it has been a fairly light year for corn earworms, with a few local exceptions. Historically, it seems that populations as determined by pheromone trap catches really start to take off around August 20, which just happens to be today. In my trap, I caught 21 moths this morning, which isn't a huge number but could signal the beginning of the upturn. As always, I advise all sweet corn growers to be carefully monitoring their pheromone traps.

At this point in the season, you should be spraying insecticides if you have corn that has green silks and you are catching more than 10 moths per night in your trap. Here are a couple of pointers that may help you manage corn earworms.

1. Make sure you are getting good coverage of the silks. This is where the eggs are laid and how the larvae get into the ear, so having insecticide present on the silks is the key to earworm management. One way of testing your coverage is to clip a water sensitive card to the silks on several ears before you spray. After spraying, look at the cards. If they have turned blue, then you are getting good coverage. If they are still mostly yellow, you may need to make some adjustments to your sprayer to get the coverage you need.
2. If the pyrethroid insecticides are working for you, stick with them. If resistance is not an issue, they will provide excellent control at a reasonable price. If the pyrethroids have not worked well for you, you should switch to Coragen® or Radiant®. Over the last several years, these have been the most consistent products in my insecticide trials.
3. When pheromone trap counts get high, shorten the interval between sprays to 2-3 days. If you are getting good coverage, there is no advantage to spraying more frequently. If counts are low, in the 10-25 range, you can probably expand your interval to 3-4 days.
4. When silks turn brown, they become much less attractive to earworm moths for egg laying. Therefore, you can stop spraying at that point. Often, that will mean that you don't spray for the last 7-10 days your crop is in the field. This may seem scary, but if you have done a good job spraying up until that point, your crop should be fine.

If you are growing a Bt hybrid, you should continue with at least a minimal spray program to control other pests and help control any stray earworm that escapes the Bt toxin.

Fall Armyworm - (*Rick Foster, **fosterre@purdue.edu**, 765-494-9572*) - I am seeing fairly high numbers of fall armyworms in sweet corn. Remember that the optimal time to control fall armyworm is in the late whorl stage, just like for European corn borers. A well-timed and well-placed pyrethroid insecticide application over the whorls just before tasseling should provide excellent control. The later sprays for earworms will take care of any late hatching armyworms or survivors of the first spray.

Squash Bug Observations from Northern Indiana - (*Liz Maynard, **emaynard@purdue.edu**, 219-531-4200*) - In a plot of cucurbits at the research farm, squash bug adults, eggs, and nymphs are all present (see Figures 5 and 6). Dried brown areas are visible on squash and pumpkin leaves where nymphs have congregated and fed (see Figure 7). These insects can also feed directly on fruit of pumpkins and squash (see Figure 8). Small nymphs are much easier to control with insecticides than large nymphs or adults. For additional information and control measures, see *Cucurbit Insect Management* (*E-30-W*) at **http://extension.entm.purdue.edu/publications/E-30.pdf** and the *Midwest Vegetable Production Guide for Commercial Growers* (*ID-56*) **http://mwvguide.org**.

Figure 5. Squash bug adults laying eggs on leaf of 'Big Max' giant pumpkin. (*Photo by Liz Maynard*)

Figure 6. Squash bug nymphs on acorn squash leaf. (*Photo by Liz Maynard*)

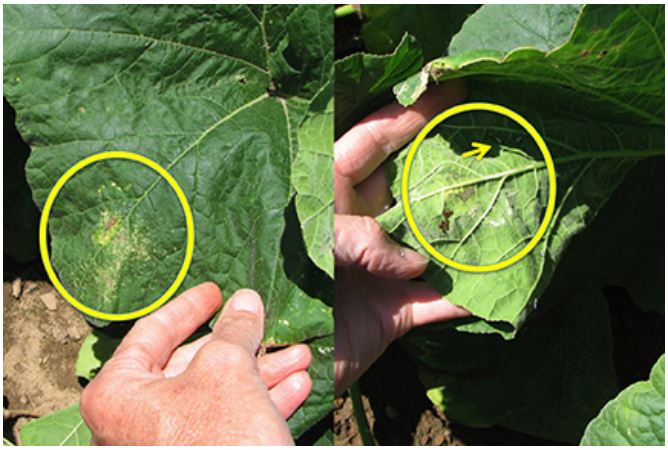


Figure 7. Yellowing and dry brown area on leaf caused by feeding of squash bug nymphs. Upper surface of leaf (left) and underside showing portion of egg mass, and nymphs (at arrow) (right). As feeding progresses, brown areas become much larger and entire leaf can die. (*Photo by Liz Maynard*)

Figure 8. Squash bug nymphs and adults feeding on a mature pumpkin fruit. This photo was taken several years ago in mid-September, and illustrates the potential for problems if squash bugs are not controlled. (*Photo by Liz Maynard*)

Yellowing of Pumpkin Leaves - (*Dan Egel, **egel@purdue.edu**, 812-886-0198*) - Many pumpkin growers are concerned about pumpkin leaves that have turned yellow. There are many reasons why a pumpkin leaf might turn yellow. Some of the reasons are outlined below.

Older leaves often turn yellow as a result of nutrient transfer to younger leaves. The overall health of a plant is best gauged by looking at the young rather than the old leaves. I would not be too worried by yellowed older leaves on plants close to maturity.

Many different types of stress may cause a leaf to turn yellow. In particular, too much or too little soil moisture, temperature extremes or other environmental factors may result in yellowed leaves.

Root problems such as root knot nematode or Fusarium crown rot may cause leaves to yellow.

Yellowing can also be caused by downy mildew. However, I have not observed any downy mildew in Indiana this season. See the article in issue 588 of this newsletter for more information on downy mildew.

Some insect pests can cause a leaf to turn yellow. For example, squash bugs or squash vine borer infestations may cause yellowed leaves.

Finally, it just might be something you applied to the field. Recently, pumpkin and squash leaves in research plots have turned yellow where Quintec® has been applied (see Figure 9). I do not think that any yield loss will result, but it might be good to become familiar with this symptom. The manufacturer Dow Chemical reminds me that this language is on the label: *"Carefully inspect the crop several days after each application of Quintec® and at regular intervals during crop development. Under certain environmental conditions, Quintec® may cause leaf spotting and chlorosis. If these symptoms occur after applying Quintec®, discontinue its use."* Note that chlorosis is another word for yellowing.

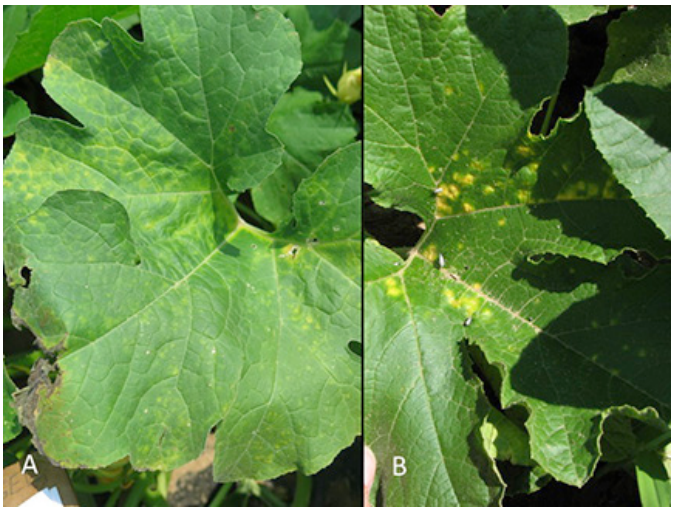


Figure 9. Yellowing of pumpkin leaves may be caused by the fungicide Quintec. A. Pumpkin leaf from a research plot with diffuse yellowing (*Photo by Dan Egel).* B. Spots of yellow on a squash leaf (note, the squash bugs present are not causing the yellow spots) (*Photo by Liz Maynard*).

Prevent Weed Seed Production and Make Notes for Next Year - (*Liz Maynard, **emaynard@purdue.edu**, 219-531-4200*) - A priority in weed management at this time of year is preventing seed production and addition of new weed seeds to the soil. The largest weed plants can make can make many thousands of seeds. Pulling or chopping the weeds and removing them from the field if they have begun to flower will help to reduce weed pressure in future years. Even a small patch of weeds going to seed can impact the weed population in a field because the weed seed can be spread by tillage.

By the time weeds are large they have already exerted much of their competitive effect on the crop, but there can still be benefits to the crop to removing them. Tall weeds can interfere with pesticide applications to the crop, make harvest more difficult, harbor pests, and shade the crop.

Another late summer weed management task is to make note of what weeds are where. This information is useful in planning weed management for future crops. Of particular importance are weeds that have (or will) shed seed, new kinds of weeds in the field, and species that were poorly controlled this year. Don't forget to check fields that will be rotated into a vegetable crop next year, whether owned or rented.

One example of a 'new' weed you might see is Palmer Amaranth. This relative of redroot pigweed has been spreading across Indiana fields since first observed a few years ago. In southeastern states it is already a serious problem in cotton and soybeans because most populations are resistant to both glyphosate and ALS-inhibiting herbicides. Like many problem annual weeds, it grows quickly, is competitive with crops, and can produce 100,000 seeds per plant or more. There is concern that it will continue to spread and become a serious problem in Indiana. Palmer amaranth looks similar to other pigweeds, but it has longer petioles (leaf stalks) and the seed head may be several feet long. For pictures and more identification tips, see *Palmer Amaranth Biology, Identification, and Management* (*WS-51-W*) at **https://www.extension.purdue.edu/extmedia/WS/WS-51-W.pdf**, or check out the Purdue Weed Science video at **http://www.youtube.com/watch?v=aVbgPGg0GO0**. Weed scientists recommend that if you find Palmer Amaranth that has already produced seed, do not pull it because of the risk of spreading seed. Mark the location and come back next spring to identify and kill seedlings in that area.

There are a number of resources to help with identification of other weeds you don't recognize. Several web sites are linked at the Purdue Fruit and Vegetable Connection **https://ag.purdue.edu/hla/fruitveg/Pages/weed_management.aspx**. Purdue Extension county offices can provide assistance. The Purdue Plant and Pest Diagnostic Lab accepts physical samples or digital images **http://www.ppdl.purdue.edu/PPDL/samples.html**.

Beekeeper Survey to Assess Honeybee Losses in Indiana - (*Roy Ballard, **rballard@purdue.edu**, 317-462-1113*) - By many accounts Indiana beekeepers experienced substantial honeybee losses over the past winter. Such losses result not only in disappointment and personal monetary loss but also can impact the production of honey and other products of the hive and, perhaps more significantly, the potential for successful pollination of fruits and vegetables in the state.

A survey has been developed to gather information that will allow the assessment of honeybee losses during the winter of 2013 and spring of 2014. This survey is specifically for hobby and commercial Indiana Beekeepers who had honeybees from fall 2013 until today–or at least until April of 2014.

The electronic survey will be available through the first week in September and should take no more than 5 to 10 minutes to complete. Find it here: **https://purdue.qualtrics.com/SE/?SID=SV_0CHHI18moAhpDo1**

If you have questions or concerns or issues with completing the survey, please contact Roy Ballard.

USDA Local Food Directories - (*USDA-AMS*) - Are you a manager, operator, or owner of an on-farm market, a Community Supported Agriculture (CSA) enterprise, a food hub, or a farmers market? We at USDA are making it easier for your organization or business to reach more customers. We offer four directories to help local food businesses connect with buyers. Building on the success of the National Farmers Market Directory, USDA has developed national directories for On-Farm Markets, CSA Enterprises, and Food Hubs designed specifically to communicate operating information, product selection, terms of payment, and most importantly, location (addresses and map coordinates) in a dynamic environment that allows you to enter your baseline information in minutes, then update it anytime you want. The directories are available free of charge to registering organizations and businesses. Register as many organizations or businesses as you manage, own, or operate. The directories will be available to the public no later than January 2015.

The main registration and update webpage at **http://www.usdalocalfooddirectories.com/updates.html** includes brief description of each directory. You can add your information to the directory that fits your operation and you can register each business or organization you manage, own, or operate. It only takes a few minutes even when you access more than one directory.

If you have already registered, we thank you for your support. Please pass on this information to other businesses and organizations who would benefit by reaching a broader base of customers interested in local foods.

Contact USDA at **directoryupdates@ams.usda.gov** for more information.

Regional Food Hub Project Needs Input - (*Keith Robinson, **robins89@purdue.edu**, 765-494-2722*) - Purdue Extension will host meetings throughout Indiana for specialty-crop producers, wholesalers and community leaders to help the Indiana State Department of Agriculture assess the potential for a statewide network of regional food hubs.

The nine sessions will be held from Aug. 26 to Sept. 9 to gather comments as part of a study to determine whether there is a need for increased marketing of locally grown specialty crops and to make them more readily available to consumers through the additional distribution system of food hubs.

Food hubs are an emerging system for the collection, processing and distribution of local foods. They can consist of space for retail vending, processing and equipment; community kitchens; and warehousing, packaging and transportation distribution facilities.

The project is funded by a USDA Specialty Crop Block Grant and administered by ISDA. The project website is at **http://indianafoodhubs.org**.

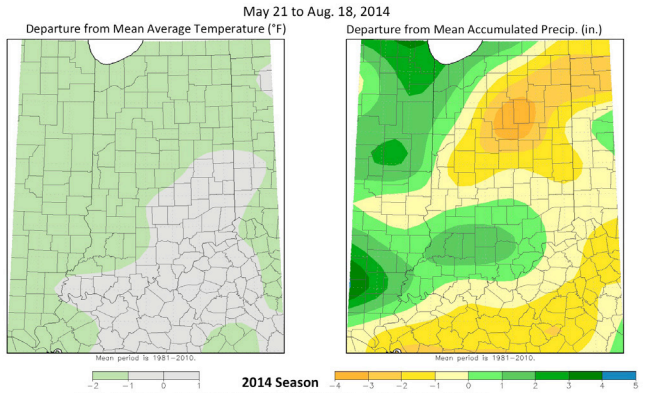
Meeting dates, times (all times local) and locations:

- Aug. 26, New Albany: 10:30 a.m. to noon, Purdue College of Technology, Shine Family Room, 3000 Technology Ave.
- Aug. 27, Batesville: 10:30 a.m. to noon, Margaret Mary Health Auditorium, 321 Mitchell Ave.
- Aug. 27, Indianapolis: 3:30 to 5 p.m., Purdue Extension's Marion County Office, 1202 E. 38th St.
- Aug. 28, Fort Wayne: 2:30 to 4 p.m., Purdue Extension's Allen County Office, 4001 Crescent Ave.
- Sept. 3, Valparaiso: 10:30 a.m. to noon, Porter County Administration Center, Classroom 102A, 155 Indiana Ave.
- Sept. 4, Columbus: 10:30 a.m. to noon, Purdue Extension's Bartholomew County Office, 1971 State St.
- Sept. 4, Evansville: 4:30 to 6 p.m., Purdue Extension's Vanderburgh County Office, 13301 Darmstadt Road, Suite A.
- Sept. 9, Lafayette: 10:30 a.m. to noon, Purdue Extension's Tippecanoe County Office, 3150 Sagamore Parkway S.
- Sept. 9, Muncie: 4 to 5:30 p.m., Delaware County Fairgrounds, Heartland Hall, 1210 N Wheeling Ave., Muncie.

For more information about the regional meetings, contact Laura Buck, ISDA project manager, at 317-607-9797 or by email at **lbuck@isda.in.gov**.

What Do You Want to Hear at Winter Meetings? - (*Liz Maynard, **emaynard@purdue.edu**, 219-531-4200*) - Plans for winter vegetable programs are getting underway. Let us know what you'd like to hear about and who you'd like to hear from. Send email to **emaynard@purdue.edu** or call 219-531-4200 ext. 4206 and leave me a message. Thanks!

Climate Info – Has it been wetter, drier, colder or warmer this year? Check out the Indiana State Climate Office at **www.iclimate.org** to find out. The figure below shows just a couple of the maps available on the site.



Most of Indiana was cooler than normal for the past 90 days. Central and Eastern Indiana were drier than normal.
Source: www.iclimate.org, Indiana State Climate Office

Upcoming Events

University of Illinois Pumpkin Field Day. Thursday, Sept. 4, 2014, 10:00 a.m. to 3:00 p.m. Central Time. Ewing Demonstration Center 16132 N. Ewing Rd; Ewing, IL 62836. Indiana growers may be interested in this event where University of Illinois Extension Specialists and Educators will discuss variety selection; disease, insect and weed management; cover crops; and no-till transplanting. A pumpkin variety trial, with over 50 different cultivars, has been established as well as field demonstration plots to accompany each of the presentations. Invited speakers include Kate Kammler, University of Missouri Extension, who will discuss pumpkin variety selection, and Wayne Sirles, Rendleman Orchards in Alto Pass, who will share his experiences on cover crops and no-till transplanted pumpkins.
Free, but pre-registration is required by Aug. 29. Register online at: **https://web.extension.illinois.edu/registration/?RegistrationID=10635**, or call 618-687-1727.

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