

VEGETABLE CROPS HOTLINE

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

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vegcropshotline.org

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CORN EARWORM – (Rick Foster) – We are in the middle of our first generation flight of corn earworm. Trap counts from the Purdue Ag Centers around the state can be found here: extension.entm.purdue.edu/cornearworm/index.php. As you can see, counts are variable but relatively low. However, moths are being consistently caught in most locations. For sweet corn that is silking before the neighboring sweet corn silks, I recommend treating if any moths are being caught. So, if you have sweet corn that is silking now, it would be a good idea to protect those ears with insecticides. If resistance is not an issue, the pyrethroids (Warrior®, Brigade®, Mustang Max®, Hero®, etc.) provide excellent, relatively inexpensive control. If those products fail to provide the expected levels of control, it is probably due to resistance and growers should switch to the more expensive alternatives such as Coragen®, Radiant®, and Belt®. Make the first application when 70% of the plants have silks visible and apply every 3-5 days until the silks turn brown.



THRIPS – (Rick Foster) – Thrips are very tiny insects that are difficult to see with the naked eye. They cause damage as adults and nymphs and scrape the epidermis from the leaves to reduce photosynthesis. The feeding damage on some crops, such as cabbage, can reduce the cosmetic appeal of the produce. Some thrips will also vector viral diseases such as tomato spotted wilt virus (TSWV).

Onion thrips are pests of both onions and cabbage. They will often build up in numbers on small grains

such as winter wheat. When that wheat starts to dry down or is harvested, the thrips will move en masse to neighboring fields in search of new food sources. That is why we always advise vegetable growers not to plant onions or cabbage near winter wheat. The damage to onions is to the leaves and suppresses bulb growth and the damage to cabbage is more cosmetic. Onion thrips, being as small as they are, like to hide within the folds of the leaves so it is often difficult to get insecticides to where they are so when you spray, use as much water and pressure as possible to force the insecticide down into the plant. The pyrethroids, Actara®, Assail® and Radiant® will provide good control. For organic growers, Entrust® is the product of choice.

Western flower thrips are the most likely culprit on tomatoes. They can feed on the bloom and cause blossom drop or deformed fruit. They may also lay eggs in small fruit causing scars on the developing fruit. Tomato spotted wilt virus is relatively rare in Indiana but can occur. The symptoms of TSWV are dark lesions of the foliage, stunted growth, and fruit with characteristic halo markings. If you see TSWV symptoms, you should immediately start a spray program to control the thrips. If TSWV is not present but thrips feeding damage is observed, treat if you see an average of 5 or more thrips per flower. We do not have a threshold for tomatoes grown in high tunnels but I would suggest that the threshold might be somewhat less than in the field, since the value of the crop is higher and the cost of the pesticide is limited due to the small area. Notice that you cannot use Radiant® in a high tunnel or greenhouse.



APHIDS – (Rick Foster) – We continue to see lots of aphids on a variety of crops. One of the key symptoms of aphid damage is the inward curling of the leaves. However, if you wait until you see that symptom, you may well have already suffered yield loss so you should make it a regular practice to occasionally walk your fields and turn over a number of leaves and look for the first aphid invaders. Check *Midwest Vegetable Production Guide for Commercial Growers 2013* (ID56) for insecticide choices.



YELLOW STRIPED ARMYWORMS – (*Liz Maynard*) – This half-inch yellow striped armyworm caterpillar (see Figure 1) has been chewing on tomato leaves in a high tunnel in northern Indiana. The hole on the leaf, and smaller holes on nearby leaves, are almost easier to see than the larva. The injury to the leaves isn't enough to worry about, but in past years I have observed feeding on fruit that caused significant yield loss. The caterpillars tunnel into the tomato and feed from the inside. These tomatoes in the photo will be setting the first fruit in the next week, just in time for a hungry caterpillar.

I don't know how widespread these caterpillars are around Indiana, but would advise tomato growers to scout the crop, looking for small holes on the leaves and identifying any caterpillar near the holes. Effective insecticides are available for both organic and conventional production systems; consult the *Midwest Vegetable Production Guide for Commercial Growers 2013* (ID-56).



Figure 1: Yellow striped armyworm on a tomato leaf. (Photo by Liz Maynard)



SHADE FOR HIGH TUNNELS – (*Shubin K. Saha*) – Expansion of high tunnel growth facilities continues to expand across the state and throughout the U.S. This is being driven by a few things including the Natural Resource and Conservation Service cost share program as well as an increasing interest in locally produced foods.

High tunnels allow growers in Indiana to plant earlier than they could in the field as well as extend the season later into the fall and potentially winter. Frequently in the late winter, early spring, and again in the fall, solar radiation begins to diminish. At those times the goal is to maximize solar radiation and would not require shading. In fact shading at that point can reduce crop growth and development. During the late spring and through the summer, days are longer and there generally is a significant amount of solar radiation. In many cases with the heat load and excess solar radiation, you can begin to see negative impacts on crops including sunburn and diminished fruit quality for crops

such as tomatoes and peppers (see Figure 2). One way of managing these issues is to utilize some sort of shading on your high tunnel.



Figure 2: Sunscald on bell pepper in unshaded high tunnel. (Photo by Shubin K. Saha)

Shading can be approached in a variety of ways. Further, depending on the method of shading one can also dictate exactly what percentage of shade or solar radiation is passing through the material into the high tunnel. For full sun crops, starting at 30-40% shade is likely the range you want to utilize. Shade can be provided by applying a black woven shade material which can often be installed in a similar fashion that the polyethylene is attached to the structure. Commonly one might use existing channel and wiggle wire. This is one of the easier methods of installing shade cloth. Another method of attaching the shade material might be to utilize stakes and rope to tie it down on the high tunnel (see Figure 3). The most important thing is to determine what is practical for your operation as you will likely need to install it in the month of May and then remove it again sometime in September.



Figure 3: Woven shade cloth fabric installed on the exterior of the high tunnel. (Photo by Steve Hawkins)

Black woven material is likely the most common means of providing shade, however there is also shade paint. It is essentially a white wash directly applied to the clear polyethylene covering the structure. One of the downsides of shade paint is the inability to obtain a consistent layer so shading is uniform throughout the entire structure. Additionally if applied too heavily it may require pressure washing to remove the paint in the fall.

Likely the next approach would be to utilize a shade material inside the structure. Aluminet® is one of the more common materials utilized inside a structure. It is a metallized woven material that is available also in different weaves to vary the amount of shading needed for your situation (see Figures 4 and 5).

There are multiple options to achieve the desired shade and ease of installation and cost should be considered when making decisions for your structures. If you have further questions or would like some assistance, please contact Shubin K. Saha, ssaha@purdue.edu, (812) 886-0198.



Figure 4: Aluminet® shade material inside the structure. (Photo by Shubin K. Saha)



Figure 5: Samples of Aluminet® and woven shade material. (Photo by Shubin K. Saha)

THINKING ABOUT SOIL IN A WET YEAR - (Liz Maynard)

- Between the drought last year and too much rain this year there has been plenty of opportunity to observe benefits of soil with good physical properties, and problems in soil lacking those properties.

In compacted soil there is less pore space for air, and many pores are very small. Water infiltration and drainage is slow, leading to standing water, greater run-off and erosion, and saturated soil in the root zone. Plant roots don't grow well in the tight soil, and when soil remains wet lack of oxygen also inhibits root growth and activity. Plants growing in these conditions are likely to be small. They may show symptoms of nutrient deficiency, either because roots aren't functioning well or because nutrients have moved out of the root zone.

In addition to the degree of compaction, the crumb structure of soil influences how it performs in wet conditions. Compounds produced by microbes living in the soil stick soil particles together to form 'crumbs' of various sizes. The various sizes lead to a variety of pore sizes in the soil, improving infiltration, drainage, and available water holding capacity. Crumbs also resist erosion caused by water flowing across the soil surface.

In the short time frame of this season's crop, it may be possible to mitigate some problems by creating drainage or supplying additional nutrients. But improving the soil is a multi-year proposition.

Cover crops are important tools for soil improvement. In fields where early crops are finished in July, summer cover crops can get the process started. Sudan-grass or sorghum sudangrass, and buckwheat are good candidates for planting in July.

Sudangrass and sorghum sudangrass produce much more biomass than buckwheat. Their roots can get through a compacted plow layer. These characteristics make them good choices for addressing the soil problems discussed above. They require about 70 days of growth for full benefit. If planted early, they could be followed with a winter cover crop of winter rye. If planted later, they could be allowed to winterkill with residue left on the surface.

Buckwheat takes about 40 days for full growth. It is easy to work into the soil and so it works well before planting a fall crop.

A healthy soil has good physical characteristics, but that's not all. The chemical and biological characteristics of soil are also vital. Learn more about what makes a healthy soil at the full-day Organic Soil Management Workshop in Clinton County or the two-hour Organic Soil Management On-Farm Research Field Day in Hamilton County, both on July 12 (see Upcoming Events listing in this newsletter).



ORGANIC SOIL HEALTH FIELD DAY - (Keith Robinson) -

Vegetable growers will have the opportunity to learn about organic production and how to evaluate soil health during a July 12 field day at a farm that is part of

a research project involving Purdue University horticulture faculty.

The event will be held 3:30-5:30 P.M. at **Green BEAN Delivery's** Feel Good Farm, 25325 Lamong Road, Sheridan.

Visitors will see cabbage nearly ready for harvest in research plots and learn how to conduct on-farm research trials and measure soil health.

The research is led by Lori Hoagland, a Purdue assistant professor of horticulture with expertise in soil microbial ecology. The project will determine how organic soil amendments change the community of microbes that live in the soil and how those changes influence growth and disease in vegetable crops.

"We know that soil microbes play a key role in helping plants fight disease, but we still have so much to learn about how to manage these communities in the field for agricultural benefits," said Hoagland. "Multi-year studies on working organic farms are essential to unraveling the mysteries of soil ecology and identifying practical approaches to improve vegetable production."

Purdue's partner in the research project, Green BEAN Delivery, provides expertise in fresh-market vegetable production and contributes research sites at three organic farms, along with management of the plots. The online home delivery service provides organic produce and natural groceries to members in the Midwest. The acronym in its name stands for "biodynamic," "education," "agriculture" and "nutrition."

The research is supported by a grant from The CERES Trust.

For more information about the tour and to register for it, contact Jessica Garvert at jgarvert@purdue.edu (765) 494-9228. Information on the Feel Good Farm is at www.thefeelgoodfarm.com.



UPCOMING EVENTS

Good Agricultural Practices from A to Z.

Wednesdays, July 10, 17 and 24, 6:30 – 9:00 P.M. Eastern time at the following locations:

Grant County, Ivy Tech Community Rooms #164/165, 261 South Commerce Drive, Marion. Contact: John Woodmansee, jwoodman@purdue.edu, (765) 651-2413.

Hancock County Extension Office, 802 N. Apple St., Greenfield. Contact: Roy Ballard, rballard@purdue.edu, (317) 462-1113.

Johnson County Fairgrounds Education Room, 484 N. Morton St; Franklin. Contact: Sarah Speedy, sspeedy@purdue.edu, (317) 736-3724.

Lake County Extension Office, 880 East 99th Ct, Suite A, Crown Point. Contact: Nicole Witkowski, nikky@purdue.edu, (219) 755-3240.

Monroe County Extension Office, 3400 S. Walnut St., Bloomington. Contact: Amy Thompson, afthompson@purdue.edu, (812) 349-2575.

Hendricks/Morgan County, Hoosier Organic Marketing Education, 8370 S SR 39, Clayton. Contact: Cissy Bowman, cvof@earthlink.net, (317) 539-2753. Please email jellett@purdue.edu or your host (above) if you are interested in attending, need special accommodations to participate or if you have questions. Registration is due on or before July 5 and costs \$30 per person and \$10 for each additional person from the same farm. Participation at a hosted site is required at all three sessions to receive a certificate of attendance. Those who would like to join from another location with high speed internet connection are welcome to do so at no charge.

Participants can register online or download a registration form at ag.purdue.edu/hla/fruitveg/Pages/Events.aspx

Organic Soil Management Workshop.

Friday, July 12, 2013. 9:30 A.M. – 5:30 P.M. Eastern time. Clinton County Extension Office, 1111 South Jackson St., Frankfort, IN 46041. Presenters: Dr. Lori Hoagland, Purdue, and Dr. Joel Gruver, Western Illinois University. From 3:30 to 5:30 P.M. this workshop is combined with the field day at Feed Good Farm below. \$25.00 registration fee includes lunch and materials for the full day workshop. Register by July 8. Contact: Amy at afthompson@purdue.edu or (812) 349-2575.

Organic Soil Management On-Farm Research Field Day.

Friday, July 12, 2013. 3:30–5:30 P.M. Eastern time. Feel Good Farm, 25325 Lamong Road, Sheridan, IN. www.thefeelgoodfarm.com. To register contact Jessica Garvert at jgarvert@purdue.edu or (765) 494-9228. News release: www.purdue.edu/newsroom/archive.html

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