

# VEGETABLE CROPS HOTLINE

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

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**SUNBURN ON VEGETABLES** - (Dan Egel, Shubin Saha and Liz Maynard) - Many growers across Indiana have noticed an increase in the amount of injury to the surface of produce. Such injury might appear as a chlorotic (yellow) area on the top of fruit (see Figure 1) or perhaps a light necrotic (brown) lesion on the side of the fruit facing the sun. Most growers know such injury as sunburn or sunscald.



**Figure 1:** Vegetables such as this watermelon may become sunburned if lack of foliage cover exposes the fruit to excess sun and heat. (Photo by Dan Egel)

Sunburn injury may result from a lack of foliage to protect the surface of the fruit. The recent hot, dry weather has restricted vegetative growth and provided

plenty of sunlight and heat to the surface of the fruit. There has also been plenty of wind to either damage foliage or remove the foliage from covering the fruit.

Every effort should be made to maintain foliage throughout the season. Fortunately this year, the dry weather means that there has been very little foliar disease that might otherwise reduce foliage. However, the hot and dry conditions may have restricted plant growth. Orienting vegetable plantings to minimize damage from the prevailing winds and providing windbreaks such as strips of rye or wheat may help to reduce sunburn.

Several products are available that are labeled for use as a preventive for sunburn. These products may be broken into two groups: kaolin (clay) based products and calcium carbonate based products.

Kaolin based products include Surround®. Some Surround® products are labeled for use as sunburn protection, while others are not. For example, the label for Surround WP® includes language about reducing sunburn damage, whereas Surround CF® lacks such language. These products are designed to place a layer of the clay product on the surface of the fruit. The clay will reflect the sunlight, thus reducing the sunlight that reaches the fruit. Kaolin based products should be applied in sufficient spray volume to obtain 'near-drip coverage'. Growers should be prepared to wash off the kaolin product if necessary prior to sale.

Products with the active ingredient calcium carbonate represent the other major category of sunburn protectant. Products include Purshade® and Sombrero®. These products are also designed to reflect sunlight away from the surface of the fruit. Read the label to make sure it is labeled for sunburn protection. The label for Purshade® specifies NOT to apply to runoff. As with kaolin products, the grower should be prepared to wash the product off the fruit surface.

Since both the kaolin and calcium carbonate based products work by reflecting sunlight away from the fruit surface, there is some concern that these products may reduce sunlight that reaches the leaves and therefore the photosynthesis that drives plant growth. However, a study of the use of kaolin in apples found that the reduction of sunlight to leaves may be compensated for by the reflection of sunlight into the interior of the canopy. The benefit of these products for managing

sunburn may out-weigh any reduced photosynthesis. However, growers must balance the possible benefits and risks of using any of these products.

A study in Michigan looked at the use of kaolin to reduce shoulder check in fresh-market tomatoes, a disorder described as a surface roughness that appears on the shoulder area of the fruit. The use of a kaolin product actually increased the amount of shoulder check found in tomatoes.

Vegetable growers should avoid using products to manage sunburn unless the label specifically states such a use on the label. For example, anti-transpirant products (e.g., Vapor Gard®) do not list on the label anything about reducing sunburn on vegetable crops.

Some pesticides may aggravate sunburn problems. For example, products with the active ingredient chlorothalonil (e.g., Bravo®, Echo®, Equus®) have a warning that applying the product to watermelon fruit may result in sunburn to the upper surface. In general, it is best not to apply any pesticides during the heat of the day.

Sunburn or sunscald damage of vegetables can be a problem, especially in years with as much sun and heat as we have witnessed this season. Avoiding sunburn on vegetables involves maintaining good foliage cover and the judicious use of the right product if necessary.



**CORN EARWORMS** - (*Rick Foster*) - I'm sure that I am not surprising anyone with this statement, but 2012 has been an unusual year. We had a very mild winter, a very early spring, and a lot of hot, dry weather since then. One insect that has been affected fairly dramatically by the unusual weather is the corn earworm. This article will be fairly long, so bear with me. I think there is some very useful information here for you. I will first list some important points and then I will try to tie it together with some useful management recommendations.

1. Corn earworms normally only overwinter in sizeable numbers in the southern third of Indiana. Obviously, this is because the weather farther north is usually too harsh for their survival. This past winter was so warm that I believe earworms successfully made it through the winter throughout Indiana.
2. We usually get most of our earworms on storm fronts from the South. This year we have had very few storms so far and I believe we are mostly dealing with populations of earworms that migrated last year and overwintered here.
3. Pyrethroid resistance in corn earworms is an ongoing issue, particularly in the South. It is present in some locations and not in others. If the storm fronts originate in an area where the earworms are resistant, then the moths that are blown up to Indiana will also be resistant and the pyrethroids

will not be effective. Growers would then need to switch to alternative products such as Coragen® or Radiant®. If the fronts originate where the earworms are susceptible to pyrethroids, then we would be able to control them well with the pyrethroids.

4. Insect development is driven by heat, the warmer it is, the faster they develop. I normally catch my first earworm moths in pheromone traps in mid-June. This year I caught my first earworm on April 9, over two months ahead of normal. This means that our usual pattern of a small first generation in late June and early July, a lull during most of July, then increasing populations either from the second generation or from migration from the South for the remainder of the season is all messed up this year. As a result, in mid-July we are catching sizeable numbers of moths in traps when we usually would not.

I have had numerous reports of pyrethroid failures this year, particularly from the northern part of the state. Here is my explanation of how we got to that point. Late last summer, storm fronts brought migrant corn earworm moths to Indiana from a location in the South where pyrethroids are no longer effective. Because of the mild winter, those earworms successfully overwintered in Indiana, in pretty high numbers. Those earworms are now infesting sweet corn that is silking and, because they are resistant to pyrethroids, are not being controlled. I can't necessarily prove any of this, but this is the explanation that makes the most sense to me.

So, what should growers do? Right now, if you are not getting satisfactory control with the pyrethroid insecticides (Ambush®, Asana®, Baythroid®, Brigade®, Mustang Max®, Pounce®, Warrior® or various combinations), switch to an alternative product. The ones that have performed best for me in my trials are Coragen® and Radiant®. Those products are more expensive than the pyrethroids, but will provide excellent control of pyrethroid resistant earworms.

For next year, buy and maintain a pheromone trap. As an example, last night we caught 2 earworm moths in the trap at the Pinney Purdue Farm. A grower in the LaPorte County area could look at that count and decide that since we are below the accepted threshold of 10 moths per night, earworms are not a problem right now. Brian Garwood, in the same county, put up a trap yesterday and caught 29 moths, indicative of a fairly serious threat to his sweet corn. We maintain a fairly up to date listing of trap catches from cooperators around the state and those results can be found at <http://www.extension.entm.purdue.edu/cornearworm/index.php>. However, if you are a serious sweet corn grower, I recommend that you have your own trap.

The best traps are the wire traps that are available from Bob Poppe's Service, 25738 N. 3200 East, Lexington, IL 61753, 309-275-5477. These traps are fairly expensive but will last many years. There are also smaller and/or nylon versions of the trap available from Gemplers and



other sources. The pheromone lures are available from a number of vendors. See the *Midwest Vegetable Production Guide* (ID-56) for some examples.

Finally, what will earworms do for the remainder of the season? I wish I knew. I first started working on earworms in 1977 and I have never seen a season quite like this one. I see no reason to expect that earworms will diminish in importance for the remainder of this season. If you have a pheromone trap, follow it closely and use the catches as a guide to determine the need to spray. If you don't have your own trap, use the catches on the website as a general guideline, keeping in mind that the trap nearest to you may be over or under estimating the earworm population on your farm.



**TWOSPOTTED SPIDER MITES** - (*Rick Foster*) - We are getting a lot of reports of spider mite outbreaks on melons, particularly in SW Indiana (see Figure 2). This is not surprising, since hot, dry weather is perfect for mites. We normally associate mite problems with watermelons, but muskmelons can also be damaged by mites. Be sure to scout both watermelons and muskmelons. The miticides that I prefer on melons are Oberon®, Portal®, Agri-Mek®, and Acramite®, in that order. The problem with Oberon® and Agri-Mek® is that they both have a 7-day PHI while Portal® and Acramite® both have a 3-day PHI. If you have already begun picking, you will likely need to use Portal® or Acramite®, but I would recommend the other two products if you won't be picking for more than 7 days.

There are a number of other crops that are also susceptible to attack by spider mites, such as tomatoes, peppers, snap beans, etc. Don't forget to look for the mites and/or their webbing on the underside of leaves. You should try to catch the populations before you start to see symptoms on the leaves to avoid yield loss. A 10X hand lens makes identifying mites a lot easier.



**Figure 2:** The yellowing between veins on this muskmelon leaf has been caused by twospotted spider mites feeding on the underside of the leaf. (*Photo by Dan Egel*)

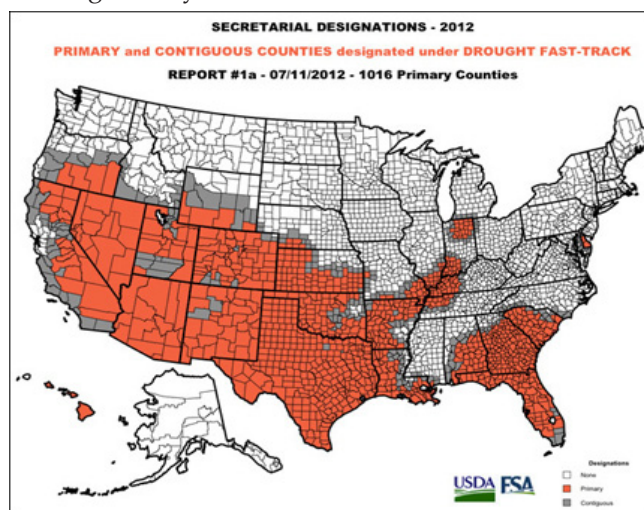
**THRIPS** - (*Rick Foster and Dan Egel*) - Thrips are another of those insects that are favored by hot, dry weather. I have received reports of serious infestations of thrips on flowers in peppers. Thrips feeding on flowers can result in oddly shaped fruit. They will also reduce the growth of onions and scar and contaminate cabbage. Thrips are also capable of transmitting several viruses that affect vegetables such as Tomato Spotted Wilt Virus. This disease is usually restricted to a few greenhouses in Indiana each year. But we urge growers to watch for TSWV and related viruses that are transmitted by thrips to tomatoes, peppers, lettuce, onions and several other vegetables. These virus diseases are usually not serious issues in Indiana, but with the unusual weather it would not be a surprise to see greater virus problems than normal. If you see virus problems, please let us know. The best way to avoid viruses is to control the vector. The best product available for control of thrips is Radiant®.



**FARM SERVICE AGENCY DEADLINE FOR CROP REPORTING** is **JULY 16** - (*Liz Maynard*) - A July 11 news release from the Indiana Farm Service Agency reminds growers that Monday, July 16, is the deadline for reporting crop acreage in order to receive benefits from the Non-insured Crop Disaster Assistance Payments Program (NAP) as well as many other FSA programs. NAP covers many vegetable crops. Contact your local FSA office to set up an appointment to report crop acreage.

The USDA reports that as of July 12, many counties in northeast and southwest Indiana will be officially designated as disaster areas due to drought (see Figure 3). In those areas, qualified farm operators will be eligible for low interest emergency loans from FSA if all eligibility requirements are met.

If you might want to take advantage of these or other programs from FSA, get in touch with your local office right away.



**Figure 3:** Counties designated as disaster areas under the drought fast-track process as of July 11, 2012. Source: USDA

**DROUGHT INFORMATION WEB SITE FROM PURDUE** - (*Liz Maynard*) - The Purdue Extension Drought Information web site <https://ag.purdue.edu/extension/eden/Pages/drought.aspx> links to information and resources from Purdue and elsewhere about drought conditions, crops and livestock, farm management, and homeowner and consumer concerns. Information is updated regularly. If you have questions that aren't answered on the site, contact your Purdue Extension county office by calling 1-888-398-4636 during business hours, email [extension@purdue.edu](mailto:extension@purdue.edu), or contact me at 219-531-4200 ext. 4206 or [emaynard@purdue.edu](mailto:emaynard@purdue.edu).



**REPLANTING POOR STANDS OF PUMPKINS** - (*Liz Maynard*)

- Growers may be wondering whether to replant pumpkin fields where emergence was uneven due to lack of moisture. Potential yield of the replants is one thing it would be good to know.

We have data on yield of pumpkins direct-seeded or transplanted in mid-July in northern Indiana. The trials were no-till planted into a harvested wheat field. Pumpkins were harvested in mid to late October. Yield of direct-seeded pumpkins ranged from 0 to 0.6 tons per acre for 8 varieties in 2004, and from 2.6 to 6.4 tons per acre for 5 varieties in 2005. Yield of transplanted pumpkins ranged from 2 to 8 tons per acre for 8 varieties in 2004 and from 4.4 to 9 tons per acre for 5 varieties in 2005. For comparison, typical yields at this site for an early to mid June planting date with conventional tillage range from 10 to 25 tons per acre.

Weather explains some of the difference in yield between years. During the pumpkin crop period (July 15 – Oct. 20), average temperature at the trial location was 68°F in 2005 and only 62°F in 2004. Growing degree day (GDD) accumulation for the period was 1807 in 2005 and only 1424 in 2004. For comparison, the 30-year Normals for July 15 – Oct. 20 are 64°F and 1535 GDD for the trial site, and 70°F and 1975 GDD for SWPAC in Knox County.

Based on this information, seeding pumpkins now in northern Indiana probably won't produce an acceptable yield at a reasonable time. Mid October is late to be starting a pumpkin harvest for most markets. In southern Indiana the yield would probably be greater and the harvest earlier. Seedings of mini-pumpkins, small pie pumpkins, and gourds are more likely to produce an earlier yield.

If reseeding seems like the way to go, note that any pumpkin plants from the original seeding will very likely produce more fruit per plant than the replants. If original plants are present in any significant number, it's probably worth thinking about a way to save them

when replanting. Don't forget to review herbicide labels for any replant restrictions.

Yield is important, but is just one of several considerations that go into a decision about replanting. If there is more information you need to help with a decision, please feel free to contact me.



**UPCOMING EVENTS**

High Tunnel Crop Talk. July 16, 12:30 p.m. to 1:30 p.m. EDT. Dial 1-866-492-6283. To see images and other shared resources (optional), point browser to <https://gomeet.itap.purdue.edu/htct/> (high speed internet only). Read notes at <http://www.indianahightunnels.blogspot.com>.

Hoophouse/High Tunnel Construction Workshop, Saint Joseph's College, Rensselaer, IN. July 30 8:00 am to 7:00 pm CDT and July 31 8:00 a.m. to 4:30 pm CDT. At this hands-on construction workshop, participants will learn how to build a high tunnel from Four Season Tools Agricultural Specialist Mike Bollinger. The cost of the workshop is \$35. For more information on the workshop or to reserve a space for the workshop, contact SJC Associate Professor of Education and Project Coordinator Dr. Lana Zimmer at [lanaz@saintjoe.edu](mailto:lanaz@saintjoe.edu) or 219-869-1926.

Sweet Corn Sampler, Pinney Purdue Ag Center, 11402 S. County Line Rd., Wanatah, IN. August 2, 5:30 to 8:00 p.m. CDT. To register call 219-465-3555 or register online at <http://bit.ly/LceYZb>. Flyer available at <http://www3.ag.purdue.edu/counties/porter/Documents/sweet%20corn%20sampler%20flyer.pdf>. This event will include a tour of sweet corn variety trial plots, presentations on insect management in sweet corn and preserving sweet corn, and taste testing of sweet corn varieties from the trial plots and local producers. **If you grow sweet corn in northwest Indiana and would like your corn included in the taste test, we would like to buy it!** Please contact Cassandra Galindo at 219-531-4200 ext. 4201 or [ws\\_bc@pnc.edu](mailto:ws_bc@pnc.edu) by July 20. We would need two dozen ears of one variety, picked on August 2, and delivered to a Purdue Extension office in Lake, Porter, or LaPorte Counties, or the Pinney Purdue Ag Center.

Organic Variety Selection and Seed Saving Workshop, Purdue University Meigs' Horticulture Research Farm, 9101 South 100 East, Lafayette, IN. August 16, 7:30 a.m. to 12:30 p.m. EDT. To register contact Dr. Lori Hoagland, [lhoagland@purdue.edu](mailto:lhoagland@purdue.edu) or 765-494-1426. Flyer available at <http://www.hort.purdue.edu/fruitveg/events/organicfarmerworkshop2012.pdf>.