

VEGETABLE CROPS HOTLINE

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

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BLACK CUTWORMS - (Rick Foster) - Pheromone trap catches for black cutworms were relatively close to normal this year. So far, there have been no reports of cutworm damage. Cutworms (see Figure 1) do not overwinter in Indiana, so they migrate in each spring. The female moths tend to lay their eggs on winter annual weeds since those tend to be the only thing available when they arrive, and they are some of the cutworms' preferred foods. Where we normally see damage is when the cutworms have started to develop on the weeds and then we kill the weeds, either with herbicides or tillage. When we plant our crop, the surviving cutworms are there, sometimes fairly large, and hungry, so even if the crop we plant is not a preferred food, the cutworms will eat it. Because of their size, they will often cut the plants off near ground level, hence the name "cutworm". Because the rainfall this spring has delayed cultivation and planting, it's possible that the cutworms have been able to develop to a good size and may cause damage when we get our crops in. Thresholds vary depending on the crop, but growers should be watching for possible cutworm in the next few weeks.

STRIPED CUCUMBER BEETLES - (Rick Foster) - We saw a few striped cucumber beetles out in the Lafayette area last week and a few this week near Vincennes. Populations so far are quite low. However, past experience has shown us that populations of striped cucumber beetles can go from very low to very high literally overnight. If we get some more consistently warmer temperatures, I would expect cucumber beetles to increase in numbers in the next week or two, particularly in the southern half of the state.



Figure 1: Black cutworm instars 2 through 6. (Photo by John Obermeyer)

APHIDS - (Rick Foster) - I have seen aphid outbreaks on a number of different crops already this spring. Apparently, the aphids like the cool weather we have been experiencing. Growers should be watching for signs of aphid feeding, usually exemplified by inward curling of the leaves. When you unroll the leaf, you will usually see a number of aphids on the under surface of the leaf. You may also see one or more natural enemies. I have been seeing a lot of syrphid fly larvae in particular, but you may also see lady beetle adults and larvae or green lacewing adults and larvae. If natural enemies are present, they may be able to control the aphid population. It may be worthwhile to watch the aphids for a week or so to see if their numbers are increasing. If they are, then a pesticide application may be warranted. For most crops, we have a number of effective insecticides listed in the *Midwest Vegetable Production Guide for Commercial Growers 2013* (ID-56).

CORN EARWORM - (Rick Foster) - We have begun catching corn earworms in our pheromone traps. Counts are still relatively low, but as I noted in the article in the April 18, 2013 issue of this newsletter, we have revised our thresholds so that we recommend treating early

season sweet corn that has green silks present if we are catching any moths in the traps. If you do not have your corn earworm pheromone trap out yet, now would be a good time to get it up if you have sweet corn that will be silking any time soon.

NEW FUNGICIDES AND LABEL CHANGES - (Dan Egel) - Several new products have been labeled or have revised labels for the 2013 season. Below find a brief discussion of some of these changes. More information can be found in the *Midwest Vegetable Production Guide for Commercial Growers 2013*. Before using any pesticide product, however, growers should always consult the label.

Inspire Super®. Last year, the application of this product was restricted to mature tomatoes less than 2 inches in diameter. In 2013, this restriction has been removed. Inspire Super® has 2 active ingredients in mode of action (MOA or FRAC) groups 3 and 9.

Quash 50WDG®. This systemic fungicide in the MOA group 3 has a new supplemental label that includes potato and sweet potato. Diseases listed on the label include early blight, gray mold, powdery mildew and white mold. Growers must be in possession of both the label and supplemental label at the time of application.

Torino 10 SC®. This systemic fungicide is labeled for powdery mildew on cucurbits. Torino® has a unique U6 mode of action so it should fit in to a fungicide rotation well. I had a chance to try Torino® on cantaloupe in 2011 and it performed well.

Zampro®. This systemic fungicide is labeled for cucurbits for downy mildew and Phytophthora blight. There are 2 active ingredients with the MOA codes 40 and 45. Although I have not been able to test this product in a year when downy mildew actually arrived in Indiana, the data I have seen tells me that this product should provide good to excellent control of that disease. Remember that it is always best to apply any fungicide before the disease arrives. This is particularly true with Phytophthora blight, which is difficult to control with any combination of fungicides and cultural controls.

Although the fungicides listed below were labeled last year, it was so dry last year that few fungicides were used. So, here are a couple of last year's new fungicides.

Fontelis 1.67 SC®. This systemic fungicide is labeled for cucurbits and tomatoes. Diseases included on the cucurbit label are: Alternaria leaf blight, downy mildew, gummy stem blight and powdery mildew. For tomato, the diseases include: anthracnose, Botrytis gray mold, early blight, and Septoria leaf blight. Fontelis® also has greenhouse uses listed on the label. For several years, I have tested Fontelis® on powdery mildew of cantaloupe and gummy stem blight of cantaloupe and watermelon. Fontelis® should be good for both of these diseases. However, remember that Fontelis® is a MOA group 7 and will not control strains of the gummy stem blight fungus that are resistant to this group.

Luna Experience® (MOA group 7 and 3) and **Luna Sensation®** (7, 11) are labeled on watermelon for several diseases. Luna Experience® is labeled for anthracnose, Alternaria leaf blight, gummy stem blight, and powdery mildew. Luna Sensation® is labeled for Alternaria leaf blight, anthracnose, and powdery mildew. These two products should be excellent additions to our fungicide line up. Although both of these products have an active ingredient in group 7, research in my lab and elsewhere shows that the active ingredient involved will control strains resistant to MOA group 7. However, the active ingredient of MOA group 11 in Luna Sensation® will be ineffective against all fungal strains resistant to group 11s.

EARLY SEASON OVERHEAD IRRIGATION TO MAXIMIZE VALUE OF CROP INPUTS - (Lyndon Kelley) - Spring irrigation can greatly improve germination, stand uniformity, herbicide activity and reduce nitrogen volatilization losses to air in dry soil conditions.

If you have irrigation available, consider applying water when a lack of rainfall threatens poor germination or poor use of your inputs. Most farmers appreciate a nice gentle rainfall the night after they finish planting or they have applied pre-emergence (soil applied) herbicides. Producers with irrigation can utilize their investment to make sure every irrigated field has the best chance for optimum plant populations, stand uniformity, and performance of herbicides and fertilizers.

Our irrigated sandy loam soils of northern Indiana and southern Michigan need about a half inch of irrigation to wet the soil down to five to six inches. A single half-inch application is often enough to germinate seed, assist in emergence (alleviate crusting) and incorporate fertilizers and soil applied herbicides. Heavier loam soils may need 0.7 inch to 1.0 inch of water to wet the top 6 inches of soil to accomplish these tasks.

One potential problem that can occur when irrigating only enough to aid a crop through emergence is the potential of a dry layer of soil developing beneath the root zone of the young seedlings. Subsequent downward root development may be restricted if the young roots desiccate and die in the dry zone before reaching adequate soil moisture at deeper depths. This situation is not very common, but irrigators need to be aware of this potential problem so that they can apply additional irrigation to prevent seedling stress. Double crop situations (soybeans or snap beans following wheat, second crop of snap bean crops) often require extensive watering to establish the second planting during the warmer and drier summer conditions.

Many soil applied herbicide labels recommend using irrigation to improve performance (or warnings to expect weed escapes if lack of rain leaves the herbicide on the soil surface). One example of this is the herbicide label from the commonly used pre-emergence corn herbicide, Bicep II Magnum®. The label states the following: "Dry weather following an application of Bicep II

Magnum® or a tank mixture may reduce effectiveness. Cultivate if weeds develop.” This statement is followed by, “If available, sprinkler irrigate within two days after application. Apply half to one inch of water. Use lower water volumes (half inch) on coarse-textured soils, higher volumes heavier soils (one inch) on fine-textured soils.” Look to the product label (www.cdms.net) for pesticides you use on irrigated fields for information on use of irrigation to improve performance or for the rain fast period to assure you are not reducing performance by applying water too soon.

The economics of using irrigation to help incorporate soil-applied herbicides are potentially very good in dry springs. The additional application cost alone is often greater than the cost of applying an inch of water. The cost of applying one half inch of water is between \$1.00 and \$4.00 per acre for most Indiana and Michigan producers. A postemergence rescue weed control program will often cost upwards of \$15 to \$20 per acre.

In drought conditions, irrigating fields prior to postemergence weed control applications can often improve performance. Labels for glyphosate-based herbicides and postemergence grass herbicides often include the verbiage, “apply only to actively growing weeds.” Drought-stressed weeds have difficulty absorbing and translocating the active ingredient where it is needed to provide effective weed control.

Not having the irrigation system ready to run was the reason most often cited for not addressing early season drought conditions. De-winterizing systems early and having pivots ready to run when you plant can make the difference between looking at a weed-free field with a uniform stand, primed for maximum yields or paying for more inputs and wishing the rest of the season you had a better start to the growing season.

For more information on maximizing the value of your inputs through the use of irrigation visit our website: www.msue.msu.edu/stjoseph and look for “Irrigation” in the menu on the left side of the browser window.

EFFICIENT OVERHEAD IRRIGATION APPLICATION VOLUMES CHANGE THROUGHOUT CROP DEVELOPMENT - (*Lyndon Kelley*) - Most overhead irrigation systems can be easily adjusted to provide application from one-half inch to two inches and there is a right time for both, providing for the crop while making good use of rainfall.

Maximum economic yield with minimum amount of irrigation is a goal for most irrigators. Efficient irrigation water use means providing enough water to avoid drought stress, but not so much that water is lost out of the rooting zone or to runoff from the surface. This includes leaving enough water holding capacity to capture the next normal rainfall thus not losing the value of rainfall.

Early in the season our irrigation goals are often focused on germinating seed, incorporating fertilizers, or soil-applied herbicides. In a “normal” year, May and early June often receive adequate rainfall to meet the needs

of the developing crops, and plant roots will grow into moisture that is stored deeper in the soil profile. Chances of receiving additional rainfall in the near future are rather good, so irrigation applications are kept to a minimum with the hope that nature will be providing more water soon. Rooting depth is not fully established at this point, increasing the potential of overfilling the soil’s water holding capacity in the rooting zone, which makes small applications of irrigation water ideal.

Our irrigated sandy loam soils of northern Indiana and southern Michigan require about half an inch of irrigation to wet the soil profile down five to six inches. A single half-inch application is often enough to germinate seed, assist in emergence (alleviate crusting), and incorporate fertilizers and soil-applied herbicides. Heavier loam soils may need 0.7 inch to 1.0 inch of water to wet the top 6 inches of soil to accomplish these tasks.

By mid-June early crops are near their full rooting depth, increasing the effective water holding capacity and lowering the potential of loss below the roots. At the same time, the potential for rainfall decreases and crop water use increases, allowing producers to increase their application volume to the 0.75-inch-per-application range. Typical crop water use would be 0.15 inch per day, making one 0.75-inch application last about 5 days.

By late June, corn and many other crops near peak water use stages of development. As July nears irrigators’ goals need to switch to maximizing water to the root zone. Potential to lose water below the root zone lessens with higher crop water use and less chance of potential rainfall meeting crop needs. Transpiration is a more effective use of water than evaporation from soil or leaf surface, providing an opportunity for irrigators to maximize effective water use by minimizing the time they wet the plant leaf and soil surface. Limiting the number of times the foliage is wetted also reduces the potential for many foliar crop diseases.

Coming into this period, irrigators may want to concentrate on “closing in on the soil capacity”, by nearly filling the rooting profile to capacity, leaving just enough room for predicted rainfall. This is especially true for producers close to or short on irrigation water capacity. Short on capacity could be defined as not having the ability to meet daily water removal, 0.25 inch per day, or five gallons per minute (gpm) pump capacity, for every irrigated acre served by the water supply.

In the summer of 2012, evapotranspiration (E.T.) for many crops exceeded 0.30 inch per day for several days in early July. Maintaining an adequate reserve of soil moisture is a good insurance policy to help plants manage stress during periods of high temperature. To build in a reserve for extended periods of drought, downtime for repairs, or periods of extreme temperatures and wind, irrigator goals during the peak water use period should be to maintain moisture levels high with enough room to capture a one-inch rainfall. If a producer’s irrigation capacity is low, this means that the grower should be starting to irrigate prior to peak use

or during rainy spells to build moisture level. "Many irrigators started too late and could never regain good soil moisture level during the drought of 2012", says Lyndon Kelley of Michigan State and Purdue Extension. "If you have the capacity to provide one inch every three days, you can afford to gamble on receiving rainfall. For most producers, starting late can lead to poor irrigated yields."

At times of peak water use, the application volume could be as large as 1.5 inches for four to five days of water use. It is all about efficiency. The plant most effectively uses water through transpiration. Water that is lost from evaporation at the soil surface or on the leaves is less beneficial to the plant, providing only a temporarily cooler environment. Small applications may help in evaporative cooling during pollination or other crucial times, but they reduce the amount of water that actually gets to the roots compared to fewer large applications totaling the same amount.

Compare two irrigators using the same total amount of irrigation water in a season. One irrigator makes five one-inch applications during the peak water use period. Another producer makes 10 half-inch applications. Assuming that there is about 0.10 inch of evaporation loss from the soil surface and foliage after each application, the irrigator making five one-inch applications will get 0.5 inch more water into the root zone.

In some situations, irrigators have equipment that applies water faster than the water can infiltrate into the soil. In these situations, smaller application volumes will reduce the potential for runoff or uneven application to the roots. In some situations, irrigators will say applications greater than 0.30 or 0.40 inch seem to run off. In these situations, reducing application volumes to prevent runoff is more important than potential evaporation losses until they upgrade sprinklers. Sprinklers that provide larger wetted diameters will have less runoff issues. Matching sprinkler performance to field/soil conditions and leaving more crop residue on the soil surface are two methods to reduce potential runoff without increasing evaporative loss from increased number of applications.

Crop water use (or E.T.) estimates can assist producers in irrigation decision-making. A good source of E.T. rate charts for some commonly irrigated crops is *Irrigation Scheduling Checkbook Method*, University of Minnesota FO-01322 www.extension.umn.edu/distribution/cropsystems/DC1322.html

Additional irrigation scheduling information can be found at the MSU irrigation web site: www.egr.msu.edu/bae/water/ or under "Irrigation scheduling Tools" on the following Michigan State University Extension website: www.msue.msu.edu/portal/default.cfm?pageset_id=28706&page_id=361029&msue_portal_id=25643

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HOOSIER HARVEST MARKET FOOD HUB TO BEGIN TAKING ONLINE ORDERS - (Keith Robinson) - Consumers interested in buying Indiana-grown food products can begin placing their orders online Friday (May 31) through the Hoosier Harvest Market food hub organized by Purdue Extension.

Complementary to farmers markets, Hoosier Harvest Market is a cooperative through which consumers can order locally produced foods at any time on a website.

"In a way many of our neighbors in surrounding states already enjoy, Hoosiers will now have the opportunity to access preferred foods locally and support their local producers directly through a virtual marketplace," said Roy Ballard, Purdue Extension educator in Hancock County and an organizer of the service.

In a food hub, farmers and other producers maintain their product availability and prices weekly in an online marketplace. Consumers shop on the website and fill their orders with products from the farmers of their choice and pay online. Farmers then deliver their products to an aggregation point for sorting and packaging, and customized individual market baskets are delivered to a pickup point that the consumer selected.

Consumers can go to www.hoosierharvestmarket.com to learn about membership, place orders and determine their closest delivery site.

Producers who want to sell their local products also can find more information on the website and join the food hub.

Based in Greenfield and delivering throughout central Indiana, Hoosier Harvest Market will have a ceremony for its first consumer delivery on June 6.

For more information, contact the market's manager, Michael Morrow, at Michael.Morrow@HoosierHarvest-Market.com, or Ballard at rballard@purdue.edu.

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