

# VEGETABLE CROPS HOTLINE

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

Chris Gunter, Editor  
(812) 886-0198  
gunter@hort.purdue.edu



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**IRRIGATION SCHEDULING TOOLS** - (Lyndon Kelley) - Knowing when to turn on the irrigation system is the main concept of irrigation scheduling. All irrigations use some system for scheduling irrigation. Checkbook irrigation scheduling and soil moisture monitoring are two common types of gathering information to improve irrigation scheduling decisions. Checkbook method of irrigation scheduling follows the concept that the soil in your field is like a bank checking account. Rainfall and irrigation applications are deposits into the checking account. Daily water removal from evaporation and transpiration (evapotranspiration or E.T.) from the field and crop would be considered withdrawals from the account. The soil as a bank has a draw back in that there is a maximum amount of water that can be held in the account. Water added to the soil beyond the soils water holding capacity is lost to the aquifer below. Four different checkbook irrigation-scheduling tools are available through MSU Extension that will adapt to irrigation in the Michiana area.

**Irrigation Scheduling Checkbook Method** - University of Minnesota is an Extension bulletin that explains basic concepts of irrigation scheduling and incorporates them into a paper system that provides support and recordkeeping. This method will provide accurate results in all of Michigan and Indiana. Crop specific E.T. values are taken from a table incorporating daily high temperature and stage of plant growth for weeks after emergence. The bulletin is available through

the University of Minnesota or from the web link listed below select "Irrigation" on the left hand side: [www.msue.msu.edu/stjoseph](http://www.msue.msu.edu/stjoseph).

**Michiana Irrigation Scheduler** is a simple computerized irrigation scheduling checkbook model from the Agronomy Department of Purdue University. This method will provide accurate results throughout Michigan and Indiana. Crop specific E.T. values are estimated from the daily high and low temperatures provided by the producer. Michiana Irrigation Scheduler is available from: [www.agry.purdue.edu/irrigation/IrrDown.htm](http://www.agry.purdue.edu/irrigation/IrrDown.htm). Irrigation Scheduler V 4.0 is a product of the Enviro Weather Program at MSU. This web-based tool pulls data from a network of 58 strategically located Michigan weather stations (Michigan Automated Weather Network, MAWN). This method will provide results for all of Michigan and the upper tier counties in Indiana. Crop specific E.T. values are calculated from one or more local weather stations representing your field location. Irrigation Scheduler V 4.0 has the greatest potential for accuracy using the most specific data. Irrigation Scheduler V 4.0 is available from: [www.agweather.geo.msu.edu/mawn/](http://www.agweather.geo.msu.edu/mawn/).

**MSU Excel Version of Scheduler** was developed as a spreadsheet alternative to the web based Irrigation Scheduler V 4.0. It allows greater flexibility and adaptability to the computer savvy irrigator. This method will provide results for all of Michigan and the upper tier counties in Indiana. Reference crop E.T. can be taken from each of the MAWN weather stations where the program will use crop specific coefficient to adjust for your crop stage of growth. The MSU Excel version of scheduler is available from: [www.agweather.geo.msu.edu/mawn/irrigation/](http://www.agweather.geo.msu.edu/mawn/irrigation/). All of the above mentioned irrigation scheduling tools, plus other irrigation management information is available from: [www.msue.msu.edu/stjoseph](http://www.msue.msu.edu/stjoseph) click the "irrigation" button on the left hand side.

**Soil Moisture Monitoring** Soil moisture monitoring can be a viable method of scheduling irrigation when coupled with appropriate record keeping and actual estimates of percent moisture available. Soil moisture holding capacity and crop removal rates (E.T.) still need to be known to allow calculation of maximum amount that may be applied and how many days till the next needed irrigation. Soil moisture monitoring methods

range from the simple feel test by a trained and calibrated person to equipment costing \$5,000 or more for the analyses reflection of emitted electron. All systems will require calibration against a volumetric sample for each soil type to achieve accuracy and meaningful data. Soil moisture monitoring has the added disadvantage of being accurate to only the specific test location. Variability in soil type, soil moisture holding capacity, crop removal at specific location, irrigation application, compaction and iteration to test site for equipment and procedure all reduce the value of soil moisture monitoring as an irrigation scheduling method. Information on soil moisture monitoring systems and their comparison is available from SOWACS a resource center for soil moisture measurement equipment at: <[www.sowacs.com/](http://www.sowacs.com/)>. Best management of water resource and increased profit and yield often come from the use of a combination of these tools and methods. Each of these tools and methods has the potential for increasing yields while minimizing water and fuel use but errors specific to the field and year can also allow these methods to be misleading. Scouting fields for moisture stress along with visual inspection of the running irrigation machine is essential.

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**EARLY SEASON IRRIGATION** – (Lyndon Kelley) – How you achieve the most agronomical and economical start from irrigation during planting season is important. Achieving the maximum uniform germination and emergence can be assured through proper early season water management. Irrigating fields prior to or just after planting can keep the planter moving and still meet the “plant into moisture” requirement.

Irrigation water applied at ½ to ¾ inch will wet dry soil down to 6 inches to replace water loss to tillage. An inch of irrigation will often be needed in a field that has not received rainfall since the cover crop was destroyed. Monitoring newly emerged crops that were “irrigated up” is essential. It is important to water enough to keep roots growing down into the moisture. Most years’ rainfall is plentiful enough to replenish water lost to tillage or cover crop, but a dry layer 6 inches to 8 inches down can greatly hinder crops development, and needs to be replenished by rain or irrigation.

Early season irrigation can be both the cause and solution to soil crusting and emergence problems. Depending on soil type, crop residue, and irrigation application equipment early season irrigation can create some soil crusting accelerated by rapid surface drying. Small applications of water 0.2 to 0.3 inch may help to allow emergence of seed through the crust.

Many herbicide options can be assisted by a timely rain or irrigation. Applications of 0.3 to 0.5 inch of water will move activated herbicides if rainfall does not occur within two days after herbicide application. Irrigating in herbicides can also create the problem of different levels of weed control between the dry corners and the irrigated portion of the field. Timely and directed scouting for weeds in dry corners will be needed later in the season.

Early season irrigation can be more accurately scheduled from monitoring soil moisture in the root zone rather than checkbook irrigation scheduling system for newly emerged crops. Later in the season checkbook irrigation scheduling will show its advantages of scheduling by soil moisture in the root zone alone. To learn more about checkbook irrigation scheduling click on the following link: <[www.msue.msu.edu/stjoseph](http://www.msue.msu.edu/stjoseph)>.

For more information on irrigating contact Lyndon Kelley, Extension Educator Purdue/MSU, Irrigation at (269) 467-5511.

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**TIME TO SET OUT CORN EARWORM PHEROMONE TRAPS** - (Rick Foster) - June 1 is generally regarded as the time to set out your corn earworm pheromone traps. Even though corn earworms don’t overwinter in large numbers in Indiana, there are occasionally enough present to cause considerable damage to early planted sweet corn (Figure 1). The combination of events that will result in earworm damage is when you are catching earworm moths in your pheromone trap and you have sweet corn that has green silks. If you don’t have both of those, then there is no need to treat for earworms.



**Figure 1:** Corn earworm larva. (Photo by Purdue University)

Last year was an excellent example of why I encourage the use of pheromone traps to monitor earworms. The second generation of earworms usually starts flying around August 20, so only late sweet corn is really at risk. However, in 2006, we started catching large numbers of moths in our pheromone traps by August 1, three weeks earlier than normal. Growers that were relying on the historical record to determine when to start spraying for earworms would have had three weeks of sweet corn that would not have been marketable. It’s possible that this year the earworms won’t appear until the usual date of around August 20, so if you start spraying as if they will appear on August 1, you may be wasting a lot of money on needless insecticides sprays. The point is that

you can make better earworm management decisions with the information you get from your pheromone traps, so I encourage all serious sweet corn growers to invest in a pheromone trap.

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**EUROPEAN CORN BORER** - (Rick Foster) - First generation European corn borer moths have begun flying around the state (Figure 1). Corn borers can be a pest of a number of vegetable crops, including sweet corn, potato, pepper, and tomato. Pheromone traps have never proven to be very effective for monitoring for European



**Figure 1:** European corn borer adult. (Photo by Bill Hutchison)

corn borers, but there are some alternative methods of scouting that work well. Corn borer moths don't spend the daytime hours in the field. They will usually move to a grassy or weedy area outside of the field (action site) to spend the day and then fly to the field to lay eggs at night (Figure 2). One way of scouting for moths is to



**Figure 2:** European corn borer egg mass. (Photo by John Obermeyer)

walk through those action sites and look for moths flying up. Another effective scouting method is to drive around your fields at night and look for moths splattering on your windshield. Chances are good that many of these are corn borers. The windshield method of scouting isn't terribly scientific but it works.

For sweet corn, you should look for whorl feeding before treating. The small larvae feed down in the whorl and as the plant grows, the feeding holes move out from

the whorl (Figure 3). If you see significant whorl feeding, apply an insecticide no sooner than 5 days before you expect tassels to emerge and no later than tassel emergence. The emergence of the tassels will force the corn borers to move and some will end up in the ear. Although a second application is recommended 5 days after the first, the initial application will provide 90+% of the control you will receive.

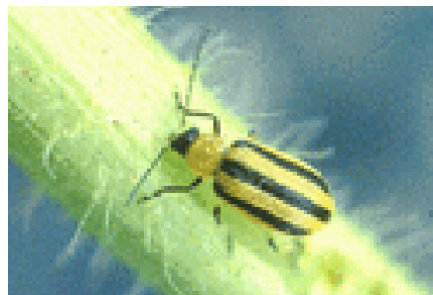


**Figure 3:** European corn borer whorl feeding. (Photo by John Obermeyer)

Generally peppers are not affected by the first generation corn borers because the only significant damage is to the fruit and no fruit are present when the moths are flying unless the plants are very early. Tomatoes are typically only attacked by late season corn borers after field corn in the vicinity has started to dry down. Potatoes should be treated if one corn borer egg mass is found on 25 leaves.

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**STRIPED CUCUMBER BEETLES** - (Rick Foster) - I have not yet seen any striped cucumber beetles, but with the warm weather predicted for the next few days, they could become active any time (Figure 1). Cucumber



**Figure 1:** Striped cucumber beetle. (Photo by Al York)

beetles often will attack a field en masse, with infestation seeming to occur almost overnight. That is why it is important to regularly scout your fields. The only way to prevent transmission of bacterial wilt of cucurbits is to control the beetles (Figure 2). Because the beetles are not very effective vectors of the bacterium, many years of research have shown that muskmelon and cucumber growers should start spraying when they find an average of one striped cucumber beetle per plant. In all of our studies on both of these crops, we have never had situation where an average of one beetle or less per plant resulted in any plants showing symptoms



**Figure 2:** Bacterial wilt of cucurbits. (Photo by Rick Latin)

of bacterial wilt. Remember that watermelons are not susceptible to bacterial wilt, so the only concern is the direct feeding damage from the beetles. Some squash varieties are very attractive to the beetles and can have lots and lots of beetles on a single plant, but the direct feeding damage is the only concern. Generally speaking, it would require at least 5 beetles per plant before watermelon or squash should be treated.

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**BEAN LEAF BEETLES - (Rick Foster)** - Overwintering bean leaf beetles have been active for several weeks. These beetles can cause problems by feeding on leaves of small snap bean plants or later on by feeding on the pods. So far, we have not received any reports of significant bean leaf beetle problems on snap beans or soybeans (Figure 1).



**Figure 1:** Bean leaf beetle and damage. (Photo by John Obermeyer)

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**AGRITOURISM SPECIALIST TO CONDUCT JUNE WORKSHOP - (Roy Ballard)** - The Purdue Cooperative Extension Service has partnered with the Indiana State Department of Agriculture and Indiana Office of Tourism Development to offer an in-depth marketing workshop on Monday, June 11, designed for agritourism entrepreneurs.

During this workshop Megan Bruch, Marketing Specialist at the University of Tennessee Center for Profitable Agriculture, will discuss marketing strategies and provide in-depth information on how to create or improve necessary marketing materials including brochures and press releases. A representative from the Indiana Office of Tourism Development will also review existing marketing opportunities available, including the new Web site listing for agritourism.

The workshop will be held and be broadcast from Pfindler Hall on the Purdue University campus. Additional viewing sites will be available across Indiana via

IP (interactive two way) video conferencing technology. Designated remote receive sites include Scott, Elkhart, Hancock, Knox, and LaPorte counties.

While this program is specifically designed for those who wish to bring the public to their farm as part of an agritourism venture, the content of the program may also be of value to anyone who is starting or expanding any business venture.

The workshop will be held from 1 to 4 pm EDT and the cost is \$15 per participant. Lunch is included. Registration is strongly encouraged by June 4. Please contact Roy Ballard at the Hancock County Extension Office to register, (317) 462-1113 or [rballard@purdue.edu](mailto:rballard@purdue.edu). For general information contact Brian Blackford at [bblackford@VisitIndiana.com](mailto:bblackford@VisitIndiana.com).

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**ORGANIC VEGETABLE PRODUCTION FOR HOMEOWNERS AND COMMERCIAL GROWERS - (Stacye Johnson)** - Four local Purdue Extension Educators from Daviess, Gibson, Knox and Pike Counties are on a mission. Together they are focused on transitioning a small plot at the Southwest Purdue Agriculture Center in Vincennes, from conventional to organic production.

The educators began the transition last year and now have information to share with local growers and the general public. On Tuesday, June 12<sup>th</sup> an informational field day centered on organic vegetable production will be held for those interested in learning about organic transition. The program will run from 6-8 pm (CDT) and will include a visit to the plot and a short information session. The Southwest Purdue Agriculture Center is located three miles North of Vincennes on the West side of US - 41. This program is free and open to the general public.

During the program the educators will share their successes, challenges and offer tips on getting started. The main topics of the evening will include insect and weed control and soil improvement. This will also include a discussion on cover crops used last year and what is being tried this year. The Gibson County Extension Educator, Jim True commented that, "One focus of our study is cover crop management for soil improvement. We saw a 20% increase in organic matter in just one year."

"Insect and weed control is a challenge during the transition process. The transitional area needs to reach a state where it can support beneficial insects and improve soil fertility. Over time this will allow target crops to out compete weeds. Before that happens, it requires quite a bit of manual labor to keep pests to a minimum", stated Pike County Extension Educator, Maria Restrepo.

From backyard gardeners to large commercial growers, the basic principles of organic production are the same. Twenty-five (25) foot buffer zones are required between organic and conventional production. Synthetic fertilizers are not allowed. Livestock manure, compost and green manures are the suggested materials to build organic matter and increase soil productivity. Seeds used must be untreated or organic. Transplants must be

grown organically from seed to harvest. And, records documenting everything about the crop from seed to harvest must be kept for a minimum of 5 years. This includes any organically approved inputs used during production, harvesting and handling.

The United States Department of Agriculture (USDA) regulates the organic labeling of products. For a producer to sell organic products, their production equipment, facilities and land all have to be certified organic.

Being able to sell products that display a "Certified Organic" label has its benefits. Consumers purchase organic products for a variety of reasons. Many consumers perceive organic produce as being healthier and more nutritious. Others recognize that synthetic chemicals are not used in organic production and it eases their social conscience to be able to say they are not contributing to the pollution of the environment.

Becoming organic is one way to diversify production and develop niche markets which can enhance economic viability. Organic produce can also be considered a "value added" product. Stacye Johnson, Knox County Extension Educator observed that, "Last month organic asparagus was selling for \$8.00 per pound at Bloomington, Indiana."

Popularity for locally grown produce is increasing. This trend works favorably for the small organic growers who plan to market and sell their produce in the communities where they live. Chad Pfitzer, Daviess County Extension Educator noted that, "This trial will provide the information and encouragement for those interested in sustaining their small farm and developing a niche in local markets."

For more information contact Stacye Johnson, Knox County Extension Educator at (812) 882-3509. If you need a reasonable accommodation to participate in this program, prior to the meeting, contact Stacye Johnson. Purdue University Cooperative Extension Service is an equal access/opportunity institution.

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**INDIANA FARM MANAGEMENT TOUR - (Announcement)** - The 75<sup>th</sup> Annual Indiana Farm Management Tour will be held in Kosciusko County on June 26 and 27, 2007. The theme for this year's tour is "*Understanding and Adapting to the Changing Agricultural Economy*".

The tour begins on Tuesday, June 26 with lunch and pre-registration at the Sam Beer Farm. Lunch begins at 12:00 p.m., is free and is being sponsored by the Kosciusko County Pork Producers. Please pre-register for lunches by Monday, June 18 by calling 1-888-EXT-INFO or by calling the Kosciusko County Extension Office at (574) 372-2340.

**Sam Beer Farm** - Interview at 1:00 p.m. (Eastern Daylight Time [EDT]). Mini-tours at 1:45 p.m. on Feed Pro System/feed records and their use in evaluating swine enterprise costs and returns, and Monsanto's Visitive brand soybean plots.

The biofuels boom in Indiana is having profound impacts on the markets for feed grains and poses a difficult challenge to livestock producers. This is particularly

true for medium-sized operations, where profit margins on limited throughput are critical for viability. Sam Beer Farms Inc. (SBFI) is a medium-sized farrow-to-finish operation managing to maintain profitability and growth opportunities in a biofuel hotbed. We will learn about the strategic considerations required to find size-consistent competitive advantages in an era of increasing input costs in hog production. Nutrient management, production data analysis, and cooperative input purchasing are strategies currently being used to increase revenues and control costs.

**Tom Farms** - Interview at 3:00 p.m. (EDT). Mini-tours starting at 3:40 p.m. on seed corn production technology, the future direction of crop genetics, the future of GPS and RTK technology, tomato production technology, and how biofuels will change marketing.

Tom Farms provides a rare opportunity to observe one of the largest and best-managed farms in the U.S. Kip Tom was recently selected as the nation's "Top Producer of 2007" by *Top Producer* magazine. Tom Farms enterprises include seed corn production, soybeans, tomatoes, national trucking services, and custom agronomic services. Several members of the Tom family are involved in managing the farm's different business units. See how they are positioning for the future on their 16,000 acres in the U.S. and Argentina. Other speakers will include Ted Crosbie, who is in charge of Monsanto's Global Breeding Program, and Andy Miller, ISDA.

On Wednesday, June 27, the tour begins at **Gingerich Dairy Farms** - Milk and donuts provided by Foremost Farms and Northstar Cooperative at 7:30 a.m. (EDT). Interview at 8:00 a.m. Mini-tours at 8:40 a.m. on the milking facilities, sexed semen/reproductive technology, and feeding management in an era of higher feed costs.

Phil Gingerich says that clear priorities and sharing the same values are key reasons why he and his brother, Merrill, complement each other so well despite their different personalities, management styles, and interests. The two partners have built a thriving dairy business through innovation, efficient facilities, genetics, watching spending, controlling debt, and the efforts of their families. One current focus is on reproductive technologies including the use of sexed semen with heifers and selected crossbred cows and hiring a reproductive specialist to help with breeding cows.

**Bishop Farms** - Interview at 10:00 a.m. (EDT). Mini-tours at 10:40 a.m. on irrigation, specialty crops, crop record-keeping technology, and grain marketing and grain storage.

How do you get into farming on a full-time basis? That question is often asked by young people who want to farm full-time. Bob and Waneta Bishop will explain how Bob made the transition from teaching school for 16 years to farming over 4200 acres. The tour stop provides an opportunity to learn about the economics of irrigation and raising specialty crops. Participants will not only learn about the technology currently used on the farm, but also how the additional information is used to enhance decision-making. Finally, the challenges

of grain marketing are as real today as at any time during recent history. The 270,000-bushel grain facility, the economics of investing in storage at the current time, and Bishop Farm's marketing plan for 2007 will be discussed.

Wednesday's lunch will be held at Clunette Elevator at 12:00 p.m. (EDT). Lunch cost will be \$5 per person. Please bring cash or a check (no credit cards). Please pre-register for lunches by June 18 by calling 1-888-EXT-INFO or (574) 372-2340.

**Clunette Elevator** - Interview at 12:30 p.m. (EDT). Mini-tours at 1:15 p.m. on enhancing crop performance with custom seed treatments; crops technology and in season monitoring; and managing plant nutrient requirements/suspension fertilizers. At 2:30 p.m. (EDT) Dr. Chris Hurt will update the market outlook for grains, soybeans, and livestock.

Providing value to customers has always been the focus at Clunette Elevator. Starting in the 1950's primarily as a grain business, Clunette has grown and changed as customer needs have changed. Today fertilizers and crop protection products are a core part of the business, and there is increasing growth in the area of crop seeds and precision services. Clunette adds value by assisting customers with technical advice and access to technologies. Custom seed treatments are applied on-site. Fertilizers and crop protection products are applied using variable rate rigs and GPS-enabled automated steering for precise application. Clunette owns an RTK network, and sells and services guidance systems. Clunette values, and works hard to maintain, long-term relationships with its customers, employees, and suppliers. Clunette plans to align its grain business with end users such as the livestock industry, soybean processors, and ethanol/biodiesel plants.

Lodging: For information, contact the Kosciusko County Convention and Visitors Bureau at (800) 800-

6090 or (574) 269-6090 or <[www.koscvb.org](http://www.koscvb.org)>. For more information contact 1-888-EXT-INFO or call the Kosciusko County Extension Office at (574) 371-2340.

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**CENTER PIVOT IRRIGATION SYSTEM UNIFORMITY** - (*Gene Matzat*) - Lyndon Kelley, Michigan State/Purdue Extension Irrigation Educator, and Beth Clarizia, Indiana NRCS Ag Engineer, will be conducting a Center Pivot Irrigation System Uniformity Evaluation Workshop on Thursday, July 12, 2007, beginning at 9:30 a.m. CDT (note local time!) at Pinney Purdue Ag Center, Wanatah. The workshop will conclude at about 2:30 p.m. Cost will be \$10 to cover refreshments and meal (pay on the day of the workshop). Please register by calling our office (219) 324-9407.

Irrigators, crop consultants, irrigation industry professionals, agricultural agency personnel and Extension educators can all benefit from learning about the center pivot irrigation system uniformity evaluation process. Those attending will participate in the set-up, irrigation run-off observation and uniformity data collection before returning to an office location to enter the data into the spreadsheet to create a report back to the irrigator. Currently available irrigation scheduling tools will also be reviewed.

This training may be important to those producers who irrigate and who have enrolled or plan to enroll in the NRCS EQIP irrigation program, as NRCS personnel will be available to answer program questions and Extension staff will share research and other information based on experiences. CCA CEUs will be available (**no** PARP or CCH credits will be given).

A map to Pinney PAC can be viewed at <[www.agriculture.purdue.edu/pac](http://www.agriculture.purdue.edu/pac)>.

For more information contact Gene Matzat, Extension Educator-Ag & Natural Resources in LaPorte County, (219) 324-9407.

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Vegetable Crops Hotline  
c/o Chris Gunter  
Southwest Purdue Agricultural Program  
4369 N Purdue Rd  
Vincennes, IN 47591