



Extension

COLLEGE OF AGRICULTURAL, CONSUMER
& ENVIRONMENTAL SCIENCES

Illinois Fruit and Vegetable News

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Editors: Nathan Johannang & Bronwyn Aly

A newsletter to provide timely, research-based information that commercial fruit & vegetable growers can apply to benefit their farming operations.

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editors, Nathan Johannang, 618-687-1727, njohann@illinois.edu or Bronwyn Aly 618-382-2662, baly@illinois.edu. The *Illinois Fruit and Vegetable News* is available on the web at: <http://ipm.illinois.edu/ipv/>. To receive email notification of new postings of this newsletter, contact Nathan Johannang at the phone number or email address above.

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Upcoming Programs

Check the **Illinois SARE calendar** for a full list of programs and links for registration.

<http://illinoissare.org/> and <http://illinoissare.org/calendar.php>

Also see the **University of Illinois Extension Local Food Systems and Small Farms Team’s website** at:

<http://web.extension.illinois.edu/smallfarm/> and the calendar of events at

<http://web.extension.illinois.edu/units/calendar.cfm?UnitID=629>.

- **Produce Safety Alliance Grower Training Course, Monday, August 13, 2018 8 a.m. – 5 p.m.** Jefferson County Extension Office, 4618 Broadway, Mt. Vernon, IL. For more information on this grower training and to register visit <http://go.illinois.edu/PSAMtVernon2018> or contact Laurie George at ljgeorge@illinois.edu or 618-242-0780. Registration will close on July 27, 2018. **There are a limited number of seats available for this training.** Once the course is full, registrations will close.
- **Tomato Production Twilight Meeting and Open House, Monday August 13, 2018. Open House starting at 5 p.m. and Tomato meeting at 6 p.m.** Jackson County Extension Office, 402 Ava Rd. Murphysboro, IL 62966. Free in field program sharing the determinate tomato variety trial at the office during peak production and discussing management issues this season. The open house before is a time for growers to look at the high tunnel and other research and talk with local educators. To register or for more information contact Nathan Johannang at 618-687-1727 or njohann@illinois.edu.
- **Southern Illinois Summer Twilight Series: Blake Gerard Farms, 26845 Ditch Rd., McClure, IL, Monday, August 20, 2018 6 p.m. 6 p.m.** This fourth and final twilight meeting of the summer series will be at the first rice farm in Illinois and cover production and developing local wholesale and retail marketing and

branding of specialty rice. For further information contact Bronwyn Aly at baly@illinois.edu or 618-695-6060.

- **2018 Pumpkin Field Day, Thursday, September 6, 2018, 10 a.m.** Ewing Demonstration Center (located about 20 minutes south of Mt. Vernon, IL) 16132 N. Ewing Rd. Ewing, IL 62836. Pumpkin Variety & Pest Management trials, No-till Production and more! This program is FREE and includes lunch but please register at <https://go.illinois.edu/pumpkinday2018> or by calling the Jackson County office at 618-687-1727, by Monday, September 3, 2018. For additional information contact Nathan Johanning at 618-687-1727 or njohann@illinois.edu.
- **Midwest Mechanical Weed Control Field Day Wednesday September 26, 2018 PrariErth farm in Atlanta, Illinois.** Visit <https://thelandconnection.org/farmers/mechanical-weed-control-field-day-2018> for more details and information about the field day as time gets closer.

News and Announcements

Open House & Tomato Production Twilight Meeting

Please join us Monday, August 13, 2018 for an Open House and Tomato Production Twilight Meeting at the Jackson County Extension Office at 402 Ava Rd. Murphysboro, IL. This year we have a research trial with 12 determinate red slicing tomatoes, including some new releases along with other on vegetable trials including asparagus, sweet snacking peppers, cucumbers, and cut flowers both in field and high tunnel. We will start with an Open House to tour the other research trials between 5 and 6 PM and then at 6 PM we will discuss tomato production and the variety trial. This is a great chance to see all 12 of the tomato varieties during the peak of the harvest season.

Please join us for this FREE, in-field program to learn more! The program will be rain or shine. For more information or to register call the Jackson County Extension office at 618-687-1727 or email Nathan Johanning at njohann@illinois.edu.



Tomato Variety Trial. Photo: K. Bell.

Regional Reports

From west central Illinois... During this year, there have been two occasions when we've received a rainfall of more than one inch. The first was in March, the second was this past Sunday (July 29) when we received 2.5". The drought this year isn't over, but we've managed to get by. For everyone in this area, if you aren't providing supplemental water, you don't have much of a crop.

On two separate occasions earlier in July, we had to quit picking sweet corn due to the lack of soil moisture, as the plant couldn't fill kernels (our corn isn't irrigated). It was in a stalling pattern. The ears were good and every kernel was there, but the corn kernels just wouldn't fill. I've never seen anything like that, even in 2012, which everyone remembers as a drought year, we didn't experience this. We were approaching this same scenario again, when we received this past rain.

Otherwise the corn crop was been good, although the corn we're picking now has somewhat shortened ears, due to the drought. No real weed or disease issues, and corn earworm numbers have been light (with the exception of late June, when numbers were high).

The high tunnel tomato yield has been reduced by 50% since around July 20, I believe due to the high temperatures we experienced earlier. There just weren't many blossoms that survived. The plants continue to look good and there are plenty of green tomatoes coming on, so the plant did recover.

We pulled our cabbage, cauliflower and broccoli crops a couple weeks ago, as they just weren't performing. As you're aware, they don't like high temperatures, and this summer has not been kind to them. Others have made similar comments to me. And the onion crop had the same issue, very few large onions this year. Peas, lettuce and spinach sure didn't enjoy the heat.

Summer heat loving crops raised on dirt, and kept watered, are doing great. Tomato, pepper (although some problems associated with sunburn), zucchini and squash, eggplant, melons, okra, green beans, etc. are doing great. Very little disease issues, but insect concerns are still present (squash bugs and cucumber beetles).

We got our bare root strawberry plants in the ground, planted on white plastic, two weeks ago. They're off to a good start. After the recent rains, we'll be able to pull up raised beds for the plug plants that will be planted the end of August.

The pumpkin crop looks good, we irrigated several times and they are beginning to flower. We've even seen a few with fruit set. Our fungicide spray program will begin in a couple of weeks. Visit <https://web.extension.illinois.edu/smallfarm/downloads/75931.pdf> for the latest fungicide recommendations from U of I pathologist Mohammad Babadoost.

Mike Roegge, Retired Extension Educator & Mill Creek Farms (roeggem@illinois.edu)

From southern Illinois... We have had a very pleasant break in the heat and humidity with a few days this past week not even making it to 80°F and even some morning lows down to the upper 50s. We have been in the midst of a low pressure system that has brought us rain chances from Sunday afternoon through Tuesday night. By now we are supposed to be past most of the rain chances and highs in the 80s and back up to about 90 by the weekend with no additional rain in the forecast for the rest of the week. Everyone got some rain and it was welcomed as most were fairly dry. At my office in Murphysboro we got a little over an inch across those days, but I heard reports from Union County of from 2 to 4 inches.

We are still picking the very last of the Red Havens and now in to Bounty, Contender, PF 17, and Blushingstar peaches among others. The peach crop overall has been light and some varieties very light which has made it challenging to keep a consistent supply of peaches with gaps between varieties. Out in the vegetable field, the rain was welcomed, but with rather dry conditions before, we have seen some extra cracking on tomatoes. We made our first harvest our determinate tomato trial and the plants and fruit set all looks good with minimal disease thus far with fungicide spray program in place. We will have a twilight meeting at my office with the trial on Aug. 13 and see the news and announcements for more details.

Pumpkins are off and growing good. We have our first set of fruit on most varieties at our Pumpkin Field Day Trials at the Ewing Demonstration Center. The plants are looking great and have appreciated the precipitation and moderate temperatures we have had. We sidedressed them with about 60 lbs N/A with ammonium nitrate to keep up their momentum now that we have fruit set. This is actually the first nitrogen we have applied directly to the pumpkins, but you can see from the picture they are not suffering. The pumpkins were double-cropped after wheat that had split nitrogen applications; however, due to late wheat planting and cold winter we had an lower yields (35-60 bu/A) than we were fertilizing for so the pumpkins have gotten a good start capturing the residual nitrogen left out in the field. This is the nice thing about splitting your nitrogen applications because you can watch the plants and adjust the rate based on the growth you are seeing.



Pumpkin Trials for Pumpkin Field Day at the Ewing Demonstration Center (left). First fruit set on pumpkins (right). Photos: N. Johannning

Nathan Johannning (618-687-1727; njohann@illinois.edu)

From Dixon Springs Ag Center...Just a brief update from DSAC for this issue. Looks like after 11 weeks of cucumber harvest, we are finally finished collected yield data for the SARE project. We plan to play around with a couple of different fertilizer application rates and pruning techniques with the remaining cucumbers now that data collection has stopped. San Andreas strawberries in the vertical stacks have started to yield fruit again after several weeks of just throwing running but not setting any new fruit. This was most likely due to the prolonged period of high heat we had earlier this summer. Tomatoes and peppers are still performing well with no signs of disease and very few insects. The two day workshop to put up the 20 x 48 high tunnel for youth programming was a success. With the efforts of 4-H youth and parents, we were able to set the posts and get the bows in place (with W trussing). To see a couple of videos from the workshop, check out our Local Foods Facebook page for southern Illinois [U of I Ext Local Foods/Small Farms - Southern Illinois](#)

Bronwyn Aly (618-382-2662; baly@illinois.edu)

Fruit & Vegetable Production & Pest Management

Putnam Scale on Blueberries

In mid-July Bronwyn Aly, Extension Educator in southern Illinois, sent me photos of blueberries (the berries themselves) infested with Putnam scale. Illinois growers (and I) have little experience with this insect. Here's a summary on it from Norman L. Gauthier and Mary Conklin of the University of Connecticut, originally published in the 1990s and updated in 2012 ...

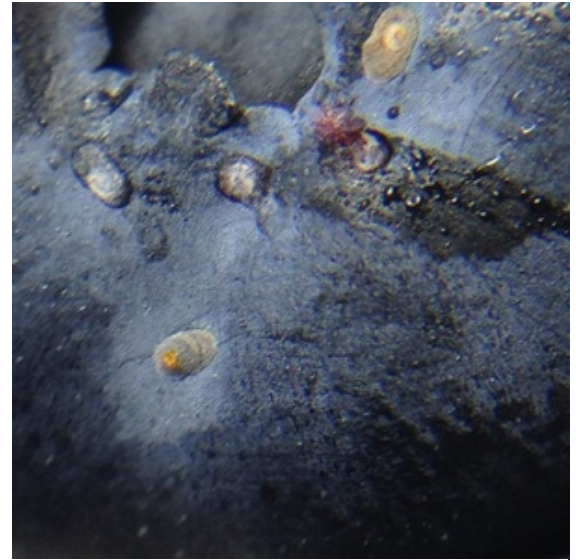
(<http://ipm.uconn.edu/documents/raw2/Scale%20Control%20on%20Highbrush%20Blueberry/Scale%20Control%20on%20Highbrush%20Blueberry.php?aid=271>)

Putnam Scale. In the last few years, we have seen an increase in Putnam scale (*Diaspidiotus ancylus*) infestations in Connecticut blueberry plantings. These usually occur in older plantings where irregular or improper pruning has allowed excessive old wood to remain on the bush. Stems and old canes are most likely to be infested, but scale colonization of new growth under heavy infestation and fruit infestations have been seen in some cases. Any planting more than six years old may be a candidate for Putnam scale invasion.

The Putnam scale is an armored scale insect that has a life cycle typical of this large group of pests. The scales pass the winter in Connecticut as fully developed adult insects, which appear as grey waxy dots about 1/16-inch in diameter. With old grey bark and wood that is scaly, these scale encrustations blend in with the color of the bark and are often invisible to the naked eye. The aid of a 10x to 20x hand lens is needed to detect infestations on wood. However, on leaves and fruit the detection is easier. The small grey dots stand out on waxy green leaves and even more so on coloring berries. On fruit, the scale appears to be surrounded by a circular red discoloration. Often the fruit is dimpled at the site of scale attachment. Even a single scale attachment per fruit can completely distort the fruit at harvest.

Life Cycle. If the waxy scale covering is carefully lifted, the immobile yellow insect can be observed. Under this waxy covering, the female feeds, mates and produces living young, called crawlers. The adult male is a tiny winged insect, which emerges from the scale covering and mates with the female. The adult male does not feed. In the spring, female scales lay a mass of eggs under their scale coverings. Around mid-May, the young scale insects, called crawlers, hatch. This stage is highly mobile and can migrate to leaves and fruit. Crawlers are mite-like in size, six-legged, yellow, with two antennae and flattened. As it matures, it stops moving, then settles down to feed. It molts, shedding legs and antennae to become flattened yellow sacs attached to the bark. It then begins to form the typical grey waxy scale covering over its body. These scales also secrete honeydew while feeding. Honeydew can drop onto leaves and fruit below. Black sooty mold may grow on this honeydew.

Putnam Scale Control. This scale is a much greater problem if bushes are not frequently pruned. The best strategy for management of scale insects is an annual pruning of old wood. Putnam and other scales that attack blueberry are principally stem feeders and do not thrive on strong, vigorous wood. Dormant pruning of old, weak canes and scale-encrusted wood prevents the scales from increasing. This should be followed by dormant oil application. Treat from March 1 to first bloom with horticultural oil. Thorough spray coverage of all stems and branches is essential. Large volumes of spray, 200 to 300 gallons per acre, are needed under heavy scale infestations. Use high pressure so that the plant is well soaked. Do not apply oil sprays within twenty-four hours before or after temperatures dipping to 32oF or below. It is best to wait for the temperature to rise above 50oF and the wind to be calm. Oil and lime sulfur, if used for the disease *Phomopsis*, should be put on as separate sprays and not combined. Sulfur is physically incompatible with superior oils.



Putnam scale on blueberry.

<https://ask.extension.org/questions/362194>

Mark Longstroth Michigan State University explained a little more about Putnam scale for growers and consumers at <https://ask.extension.org/questions/362194>, noting that increases in the prevalence of this insect may be linked to increased use of insecticides in blueberries for control of spotted wing Drosophila. These insecticides kill natural enemies of Putnam scale but not a high percentage of the scales, resulting in its increased prevalence.

Twospotted Spider Mites on Sweet Corn

Yes ... sweet corn. In the last week of July I looked at a few plantings of sweet corn in southern Illinois that were infested with twospotted spider mites – more than I’ve seen in many years of monitoring sweet corn pests. Infestations were greatest in sweet corn plantings where harvest was underway or just completed, but mites were numerous in plantings that were in full silk as well. Plantings that were still in the whorl stage also were infested, and although mite numbers were lower in these plantings, treatment was still warranted. The [2018 Midwest Vegetable Production Guide](#) does not include mite control in the sweet corn section, but Oberon is labeled and effective. If small colonies of spider mites are found on the lower leaves of young plants throughout the field, control may be cost effective. Treat when corn is 2 to 4 feet tall; applications made after the plants exceed 4 feet in height usually result in poor control because good coverage is difficult to obtain.

Corn Earworm and Other “Leps” on Tomatoes

Counts of corn earworm moths in traps have remained high in recent weeks at least in some locations in southwestern Illinois. Earworms (also correctly called tomato fruitworm) and other Lepidopteran larvae such as armyworms and cabbage looper are common late summer pests on ripening tomato fruits. They feed first on foliage or lightly on the surface of the fruit, then make a cavity and feed partially inside the fruit. Monitor plantings at least weekly for larvae and signs of their damage. The [2018 Midwest Vegetable Production Guide](#) lists insecticides that are effective for control of Lepidopteran larvae; effective products include pyrethroids, Coragen, Radiant, and a few other insecticides.

Preharvest Intervals for Insecticides on Apples

At this time of year, preharvest intervals for pesticides used on apples become a concern for apple growers with early varieties. Pages 135-136 of the [2018 Midwest Fruit Pest Management Guide](#) list the preharvest interval (PHI) for most insecticides labeled for use on apples. PHIs for some of the insecticides most commonly used on apples in Illinois in late season for codling moth or stink bug control are listed in the table below. Because of concerns over late season stink bug damage, I’ve included pyrethroids that we usually avoid using in apples, especially earlier in the season, because they trigger European red mite problems. (Related ... page 34 of the [2018 Midwest Fruit Pest Management Guide](#) provides ratings of the effectiveness of registered insecticides against several common apple pests; pages 130-131 cover PHIs for fungicides labeled for use on tree fruits.)

Insecticide	PHI (days) in Apples
Actara	14
Altacor	5
Assail	7
Baythroid	7
Belay	7
Danitol	14
Delegate	7
Entrust	7
Exirel	3
Mustang Maxx	14
Rimon	14
Sevin	3
Warrior	21

Rick Weinzierl (Weinzierl Fruit and Consulting, LLC, raweinzierl@gmail.com)

Contributions from Weinzierl Fruit and Consulting, LLC are provided through support by the Illinois Specialty Growers Association. Visit www.specialtygrowers.org for more information or to join the association.

Evaluating the Performance and Coverage of Fungicide Spray Applications



Fruit rots in several crops (especially apple and grape) are starting to make themselves known, despite many growers reporting no holes in their spray program, timing- or product-wise. This is where water sensitive cards are most useful for determining whether sufficient residue (droplets) was applied to the target area; in this case the fruit. It can be really eye opening to make a spray application only to learn that little to none was deposited on the target area, or that so much was applied it just ran off. Keep in mind at this time of the year, canopies can easily become too dense for sufficient spray penetration, allowing for the establishment and/or spread of disease. Sometimes it is just the travel speed that needs adjustment; too fast results in not enough residue; too slow sometimes results in residue collecting to run off. Sometime a more aggressive pruning and canopy management program is required. Regardless, water sensitive paper cards are a very useful tool for optimizing pesticide applications of all types.

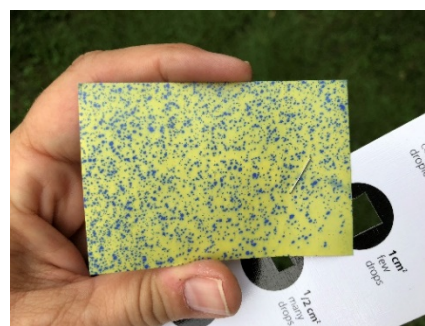


Water Sensitive paper turns blue where contacted by water

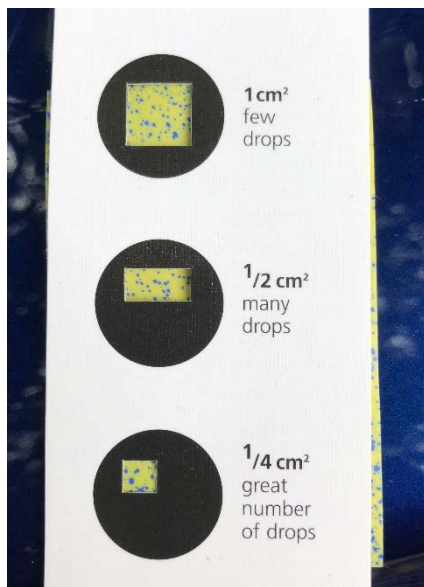
Water sensitive paper cards are usually sold in packs of 50 and usually cost \$1.00 - \$1.25 per card. Unused cards store for years if kept sealed/dry and stored in a dark, cool location. Because water sensitive paper will react to even the sweat on your hands, always handle them with gloves. I use disposable vinyl/latex gloves. Staple water sensitive cards (2" x3") randomly throughout the canopy within a row (top, bottom, inside, outside), making sure that you staple cards near fruit as well. Also staple cards at the beginning and end of the row to assess whether the applicator is starting soon enough at the start of the row and spraying through to completion at the end of the row. I use a plier grip handheld stapler or a small office stapler to attach cards to leaves and/or pedicels. This can be done ahead of an actual pesticide application, or it can be done as a test run with just water in the tank. I prefer a test run with just water in the tank for two reasons. Doing this with just water in the tank allows you to reenter the spray area immediately without the need for personal protective equipment (PPE). It also allows you to make adjustments if necessary ahead of the actual pesticide application. If you do this ahead of an actual pesticide application though, remember to abide by the reentry restriction(s) on the label(s) before retrieving the cards for evaluation...including the need for PPE. The cards need about 10 minutes to dry before you retrieve them.



Avoid wet surfaces when attaching cards, including perspiration from hands



What a water sensitive paper card should look like after a fungicide application; 50-70 drops per cm²



Overlay of the droplet counting aid

When you purchase water sensitive paper, it comes with a handy droplet counting aid. Somewhat like an apple sizing ring for thinning decisions, you place the droplet counting aid over an “exposed” water sensitive paper card and count droplets in the window. My eyes have gotten old, so counting droplets can be difficult...but I have a solution. If you have a phone with a camera, take a picture of the droplet counting aid over the “exposed” water sensitive paper. From the picture, you can zoom as close as needed to count the droplets. Also included on the droplet counting aid is a recommended droplet density for various types of spray. Fungicides for example are recommended at 50-70 droplets per cm^2 . So what can you do if you are not achieving sufficient coverage? Well it depend on where you are missing coverage. In some cases, nozzle angle needs to be adjusted to cover not just the middle of the canopy, but better angled to hit the bottom and top. In other cases, tractor speed needs to be adjusted up or down to increase or decrease deposition/number of droplets. Most importantly though in terms of fruit protection is whether you are getting sufficient penetration into the canopy. If not, you need to employ canopy management methods that result in a more open canopy. This not only increases air flow but improves spray penetration. Though probably obvious, make sure no rain is expected while you have water sensitive cards in the plant canopy...cards get real blue, real fast and are essentially useless.



Take a picture of the counting window on your mobile phone, then enlarge for easier counting (left). Fungicides require more drops per cm^2 than other types of applications (right).. All Photos: E. Wahle.

Elizabeth Wahle (618-344-4230; wahle@illinois.edu)

10 Useful Rules for Fungicide Applications

Here are a list of 10 rules I have that will help vegetable growers apply fungicides effectively and safely.

1. Apply fungicides prior to the development of disease. Although many fungicides have systemic (“kick back”) action they will not completely eradicate diseases after they have started. And by the time a single disease lesion is observed in the field, many more lesions too small to observe are already working at your crop. Most systemic fungicides move less than an inch toward the tip of the plant or may just move from the upper to the lower side of the leaf.
2. Use shorter spray intervals during weather conducive to plant disease. Each plant disease has its own “personality” and thus prefers different weather. However, most plant diseases require leaf wetness. Therefore, during periods of rain and heavy dews, more frequent fungicide applications are a good idea. The normal range of spray applications is every 7 to 14 days. Cantaloupe and watermelon growers have the guesswork taken out of this process with a Purdue University program known as **MELCAST**. Ask the author for more details by calling (812) 886-0198 or go to melcast.info.
3. Apply fungicides before a rain if possible. Water is necessary for most fungal spores to infect a plant and for the splash dispersal of many spores. Therefore, apply fungicides before a rain if it appears that the fungicide will have a chance to dry before the rain. It is not necessary to apply fungicides again after every rain. Most fungicides have a good sticker and will persist through rains pretty well. The **MELCAST** program takes into account the affect weather has on fungicides.
4. Know when to alternate fungicides. Systemic fungicides, those with a single mode of action, if applied again and again in sequence, may cause disease causing fungi to mutate into a form resistant to the fungicide. It is always a good idea to alternate fungicide applications from one FRAC code (MOA code) number to another. Read the label carefully to find language about fungicide alternation. Contact fungicides with a FRAC code of M like chlorothalonil and mancozeb are very unlikely to cause such mutations and therefore may be applied in sequence. Although some fungicides may have designations such as M01 or M02, any fungicides with an M does not need to be alternated. (Products with copper as an active ingredient may have resistance issues-see article about bacterial spot of tomato in the last issue of the *IFVN*) Table 32 in the *Midwest Vegetable Production Guide* <http://mwveguide.org/> will help growers alternate fungicides.
5. Timing of fungicide applications is more important than nozzle type and spray pressure. Studies here in southern Indiana as well as by researchers in other areas of the country have found that nozzle type and spray pressure doesn’t make as much difference as we once thought. See this article in the *Purdue Hotline* for more details <https://vegcropshotline.org/article/spray-pressure-and-nozzle-type/>. In general, the more water one uses per acre, up to about 50 gallons, results in better coverage.
6. Some diseases cannot be managed by foliar sprays. Problems caused by soil borne fungi or nematodes cannot be controlled with foliar fungicides. Examples of these types of problems would be Fusarium wilt of watermelon or root-knot nematodes of tomatoes. Also, be certain that the problem you observe is really a disease. No amount of fungicide will improve a problem caused by soil fertility. Send a sample to the university Plant and Pest Diagnostic Laboratory to find out the official diagnosis. U of I Plant Clinic: <https://web.extension.illinois.edu/plantclinic/> .
7. Use copper products for bacterial diseases. For the most part, copper products are more effective against bacterial diseases than they are against fungal diseases.
8. Some diseases require specialized fungicides. Diseases, such as downy mildew and Phytophthora blight, may require specialized fungicides. It may be wasteful to apply specialized fungicides all season long for diseases that are not a threat. For example, downy mildew of cucurbits usually does not arrive in Indiana until late in the season.
9. Double-check the label for details. Rates may vary widely based on label changes and different formulations. While you are checking the rate, also make sure that the crop and disease are on the label. (Can this fungicide

be applied in the greenhouse?) Did you get the rate from the *Midwest Vegetable Production Guide for Commercial Growers*? <http://mwvegguide.org/> Check the label anyway.

10. Play it safe. Always adhere to the Post-Harvest Intervals, Re-Entry Intervals and Worker Protection Standards listed in the label. No one wants an accident or lawsuit. Besides, the label is the law.

Dan Egel, Extension Plant Pathologist, Purdue Vegetable Crops Hotline, Purdue University (812-886-0198; egel@purdue.edu)

Less Seriously...

While out working on the pumpkin trials at Ewing I happened to spot this...

This pumpkin plant decided to take weed control into its own hands. I think we may need more pumpkins plants that have this kind of attitude about weeds!!

This 'Eagle City Gold' pumpkin plant has this waterhemp by its claws!!... (Ok or tendrils ☺)



Photo: N. Johannig

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