

VEGETABLE CROPS HOTLINE

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



Issue: 652
October 26, 2018

In This Issue

- [Time to Renew](#)
- [Growing Grafted Cucumbers for Early Season Production in Protected Cultural Systems — Lessons Learned from on-farm Trials](#)
- [Are You Interested in Participating in a Grafted Cucumber Study?](#)
- [New Disease Report – Target Spot of Tomato](#)
- [New Disease Report – Charcoal Rot of Cucumber](#)
- [IPM Revisited: A Cost-effective Solution for Balancing Pest and Pollinator Management](#)
- [Striped Cucumber Beetles: Densities and Effective Scouting in Watermelons](#)
- [We Need Your Feedback on Veggie Rotations and Field Layouts](#)
- [Vegetable Disease Extension Bulletin](#)
- [Indiana Hort Congress—Vegetable Session](#)
- [Upcoming Events](#)

Time to Renew

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

This is the final issue of the *Vegetable Crops Hotline* (VCH) for 2018. Subscribers who receive a paper copy in the mail need to renew. A renewal form is included with this issue. We are providing up-to a three years' subscription of VCH at a reduced price (1 year for \$15, 2 years for \$25, and 3 years for \$30). You can check the number on the right bottom corner of your VCH envelope to find what year your subscription will last through.

You can sign-up for Veggie Texts with the same form. Email subscribers will remain on the subscription list for VCH as long as the email address works. Email subscribers will need to send us an email or call us to sign-up for Veggie Texts. An Indiana Vegetable Grower Association (IVGA) membership form is included here too. IVGA membership no longer automatically includes the VCH subscription. You need to indicate you would like to subscribe the VCH on the membership form.

Thank you for your support of VCH. If you have any suggestions, ideas, comments, please do not hesitate to send me a note (guan40@purdue.edu or Southwest Purdue Agricultural Center, 4369 North Purdue Road, Vincennes, IN 47591). Thank you for helping us to improve the newsletter!

Growing Grafted Cucumbers for Early Season Production in Protected Cultural Systems — Lessons Learned from on-farm Trials

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

Cucumbers are extremely sensitive to cold. Locally grown cucumbers are almost only available in the summer. While in Asia, without the use of fancy heated greenhouses, cucumbers can grow all winter. Growing grafted cucumbers with cold tolerant squash rootstock is one of the key factors making this possible.

Since 2016, we started to evaluate opportunities of using grafted plants to extend early season cucumber production under protected cultural systems in the Midwest. We observed promising results in our research trials. However, knowing research trials can only tell part of the story, we initiated multiple on-farm trials across Indiana to better understand if and under what circumstances growers would benefit from this technique. This article discusses the lessons we have learned so far and raises questions that need to be answered.

Heated greenhouses

A pronounced advantage of using grafted cucumbers was observed in the situations that cucumbers were grown in soils in heated greenhouses (Figure 1). Trials were conducted in three greenhouses across Indiana. Cucumbers were planted in soils at the same time as early tomatoes were planted at the end of February. Soil temperatures across the three sites were in the lower 60°F in March, and 2 to 3 degrees higher in April. All the cucumber plants survived transplanting. At one location, the non-grafted cucumbers struggled badly and never seemed to put out new growth. The grower eventually decided to take out the non-grafted plants and replanted cucumbers later in the season. In another situation, an unknown pest damaged cucumber stem right above soil-line that caused about 30% plant loss at the end of March. Interestingly, this damage was only observed on non-grafted cucumbers. The grower also noticed that non-grafted cucumber plants had premature blooms, considerably earlier than the grafted plants. The observation indicated that the non-grafted plants were suffering from environmental stresses. Harvesting started in early April, mainly from grafted plants. Yields (per plant basis) from the remaining non-grafted plants were 65% and 39%

lower compared to the yields of grafted ones in April and May. The growers commented that they have never harvested cucumbers that early, and they were very happy about the yield of the grafted plants. Although this is a favorable situation, some growers may face the challenge of finding buyers in April as most farmers' markets in Indiana do not open until May. Another problem expressed by the grower is that they are uncertain about how to price the cucumbers in the early months.

Unheated high tunnels

Another significant benefit we observed on grafted cucumbers is a higher transplant survival rate under lethal soil temperatures in the spring in unheated high tunnels. Newly planted cucumber seedlings may wilt and die when average soil temperatures were around 55°F for two or more nights depending on the variety, the status of the seedlings, and temperatures during the day. A significant amount of plants will be lost if average soil temperatures are in the lower 50°F range. An advantage of using grafted cucumbers is that they are likely to survive in these lethal soil temperatures. A grower located in central Indiana commented that he is really amazed by the hardiness of the grafted plants. He lost more than 70% of non-grafted cucumber plants but none of the grafted ones after transplanted on March 31, 2018, in an unheated high tunnel. The grower reported a low air temperature inside the high tunnel at 21°F one morning in early April 2018. Data loggers recorded minimal air (under row covers) and soil (4"-depth) temperatures were 33°F and 48°F in his high tunnel after transplanting.

Undoubtedly, the grower is very experienced at managing temperatures in an unheated high tunnel in the spring. But still, there is an extremely high risk of losing all the plants when temperatures dropped to that level. Actually, this is exactly what happened at another farm. The temperature around the plants dropped to 28°F, that temperature killed all the cucumber plants regardless of whether grafted or not.

Using grafted plants provides a higher chance for seedling survival if frost occurs after transplanting. This is surely an advantage of using grafted plants. However, we realize that in reality, growers may not take the risk of planting cucumbers in an unheated high tunnel if frost is expected shortly after transplanting. Most growers may wait until the frost has passed. So that they may not benefit from a higher transplant survival rate of grafted plants under lethal soil temperatures.

The next question is whether grafted plants bring higher yield if they were planted after the spring frost passed. Not surprisingly, we found this is very weather-dependent. In 2018, we experienced an unusually cold April. Most growers delayed planting cucumbers in unheated high tunnels till about end April. May is quite warm in 2018. Average soil temperatures were in the upper 60°F in May and stayed above 70°F in June and July in our trials across Indiana. We saw little difference in plant growth and yield between grafted and non-grafted cucumbers. While in 2017, cucumbers were planted on March 31 and successfully established in two growers' unheated high tunnels. Growers reported more vigorous and healthier looking grafted plants

compared to non-grafted. Yield improvement ranged from 6% to 159% depending on varieties. In the situations that yield on grafted plants was almost doubled compared to non-grafted cucumbers, this was due to plant loss caused by bacterial wilt. However, we did not see differences in susceptibility to bacterial wilt between grafted and non-grafted cucumbers on other farms.

More questions need to be answered

A big surprise to us is that we noticed grafted plants were less healthy, and yield was reduced on grafted plants in one greenhouse. The same trend was observed for two years on the same farm. A unique situation for this greenhouse was very high, above 8 soil pH. It will be very interesting to find if the high soil pH contributed to the lower yield of the grafted cucumbers. Or if there are other factors involved.

The observation that unexpected pest damaged stems of non-grafted cucumber plants but not the grafted plants in one greenhouse was a surprise. Unfortunately, we were not able to catch the pest and confirm it, but according to our entomologist, the damage looked like it was caused by seedcorn maggot, which is a common pest that occurs in early spring when the soil is cool.

We would like to confirm this observation and understand why this happens.



Figure 1. Cucumbers were grown in a greenhouse in April 2018

This research is supported by the National Institute of Food and Agriculture, USDA through the North Central Region SARE program under project number LNC17- 390 and ONC17-027.

Are You Interested in Participating in a Grafted Cucumber Study?

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

We are going to continue the study of evaluating grafted cucumbers for early season production in greenhouses and high tunnels by collaborating with farmers. You will find what we have learned through the process in the [previous article](#).

The same as last year, we are going to supply grafted and normal

cucumber plants for free. These plants were grown in a conventional greenhouse. We will use untreated rootstock seeds, but they are not certified organic. What we want for you is to grow the same number and variety of grafted and normal cucumber plants, and keep track of the yields. We will provide a stipend for your efforts in tracking the data. In addition, we encourage farmers to learn grafting technique and produce grafted plants on your own. We will provide you with technical support and help with the process on site if it is needed. If you are interested in the project, please contact Wenjing Guan at guan40@purdue.edu or (812) 886-0198.

This project is supported by North Central Region SARE program under project number LNC17- 390 and ONC17-027.

New Disease Report – Target Spot of Tomato

(Dan Egel, egel@purdue.edu, (812) 886-0198)

The following two articles describe two vegetable diseases new to Indiana that were recorded this past season. While neither of the disease reports are from severe outbreaks, it might be a good idea to become familiar with what may become a new disease situation.

Target spot of tomato was identified from a tomato plant growing in a high tunnel in early July in Carroll County. At first glance, the disease appears to be early blight (Figure 1). Target spot may cause necrotic lesions in a concentric pattern. Although target spot may cause lesions on fruit, we did not observe such lesions. After incubation of the leaves, spores that appeared to be *Corynespora cassiicola*, causal agent of target spot were observed. This fungus was isolated in our lab and the identity of the fungus was confirmed by sequencing on campus. This is the first report of target spot of tomato in Indiana.

Like charcoal rot, the fungus that causes target spot also has a huge host range including soybeans, cucumber, many ornamental and some weeds. However, there appears to some host specialization in *C. cassiicola*: strains of the fungus from soybean are more likely to be a problem on soybeans, while strains from tomato are more likely to be a problem on tomato. Target spot of tomatoes is a big problem in Florida. We don't have any information on the geographical or host origin of the strain that we collected on tomato in Carroll County.



Figure 1. Target spot of tomato often causes necrotic lesions in a concentric pattern, similar to early blight.

Target spot of tomato is favored by temperatures of 68 to 82°F and leaf wetness periods as long as 16 hours. The target spot fungus can survive in host residue for a period. Therefore, it is possible that the target spot fungus could overwinter and cause disease during warm, wet weather in 2019.

Although the target spot fungus has a large host range, the apparent specialization of this fungus makes crop rotation a possible disease management option. Any practice such as adequate crop spacing and pruning that helps to lessen leaf wetness should lessen the severity of target spot of tomato. In greenhouse experiments here at the Southwest Purdue Ag Center, mancozeb products (e.g., Dithane®, Manzate®, Penncozeb®) helped lessen disease severity. Most mancozeb products are labeled for greenhouse or high tunnel use, however, the 5-day Pre-harvest Interval (PHI) would make this product difficult to use during harvest.

If you suspect target spot, be sure to get an official diagnosis.

New Disease Report – Charcoal Rot of Cucumber

(Dan Egel, egel@purdue.edu, (812) 886-0198)

This disease was identified on a long Asian cucumber growing in a high tunnel in Mid-June in Knox County. The first symptom noted was wilting of the cucumber plant. Upon closer examination, a light, gray necrosis was observed on the lower portion of the plant. In Figure 1, you may notice dark spots in the necrotic area. These symptoms, plus the resin-like drops on the stem might look like gummy stem blight. However, a look under the microscope revealed fungal structures and spores that were not from the gummy stem blight fungus. Plus, gummy stem blight is rare in a greenhouse situation where there is little moisture. When we isolated for a fungus, we found numerous micro-sclerotia. The sample was sent up to campus to confirm that the fungus was *Macrophomina phaseolina*, causal agent of charcoal rot.



Figure 1. Charcoal rot of cucumber often causes a light gray necrotic area on the crown in which may be observed numerous dark fungal bodies.

The charcoal rot fungus has many hosts and the fungus is not new to Indiana. However, cucumber have never been reported as a host. Perhaps the most common host in Indiana is soybean. Other hosts are strawberry, potato, corn and sorghum.

Charcoal rot seems to be favored by hot, dry soils. The fungus that causes charcoal rot may survive several years in the soil without a host. The hot, dry soil inside a high tunnel may have favored charcoal rot.

Management of charcoal rot is dependent on crop rotation with less susceptible hosts. Plants should be managed so as to avoid stresses such as fertility, irrigation and other diseases. Some varieties may be less susceptible to charcoal rot.

If you suspect charcoal rot, be sure to get an official diagnosis.

IPM Revisited: A Cost-effective Solution for Balancing Pest and Pollinator Management

(Jacob Pecenka, jpecenka@purdue.edu)

Insecticides are often needed to control pests in vegetable crops, but in crops that require pollinators we often worry about the impact those insecticides may have on those pollinators (Figure 1). In the summer of 2018, a team of researchers at Purdue University explored the effects of insecticide applications on watermelon yield across Indiana, considering their impacts on both pests and pollinators.

Using 5 of the Purdue Agricultural Centers (PACs), pairs of ½ acre watermelons plots were planted, each in the middle of a 15-acre corn field (10 total plots) (Figure 2). The two watermelon plots at each site were assigned either to a conventional or an integrated pest management (IPM) system. The corn surrounding the conventionally managed watermelons had a neonicotinoid seed treatment, the watermelons were given a neonicotinoid soil drench at transplant, and 4-5 pyrethroid sprays were applied

throughout the summer regardless of pest pressure. The IPM system had no insecticides applied to corn or watermelons at planting, and foliar sprays were only applied when striped cucumber beetle, reached the economic threshold of 5 beetles per plant. Only the IPM plot at the Pinney PAC (outside Wanatah, IN) ever reached the threshold and received a single pyrethroid application. The other four IPM plots received no insecticide applications. Each pair of watermelon plots had the same fungicide applications throughout the summer using the MELCAST system. Striped cucumber beetle populations were higher in the IPM plots than in the companion conventional plot in all locations. The yields for the IPM plots were higher than the conventional plots with two plots showing significantly greater yields.

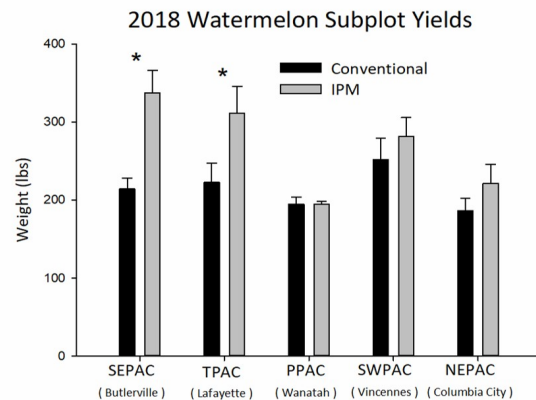


Figure 1: Watermelon weight in 50 m² subplots at 5 Purdue Ag Centers (PACs) with nearest town below. Conventional plots had prophylactic insecticides applied while only the IPM plot at PPAC reached the economic threshold and received a single spray. Other four IPM plots never reached thresholds and no insecticides were applied.

How can yields be **lower** in fields with more applied insecticides and fewer pests? We believe that the crucial difference comes from a non-target effect of insecticides on visiting pollinators. During 5 weekly surveys during peak watermelon flowering, there were 653 pollinators in the IPM plots, as opposed to just 349 in the conventionally managed plots. These visitors included “managed” species such as honeybee and bumblebees along with numerous native sweat bees and syrphid flies. The total number of visits to flowers and number of pollinating events (traveling from a male to a female flower) were recorded for all of the surveyed insects. The IPM plots had twice as many total flower visits and three times as many pollinating events compared to the conventional watermelon plots. Since multiple insect visits are required for watermelon to produce healthy and marketable fruit, the reduced frequency of pollination could be leading to the differences in yield. These trends show that a “less is more” approach may be a superior management strategy when it comes to insecticides in watermelons and the other vegetable crops that rely on bees for pollination.

This work was led by entomology PhD student Jacob Pecenka and he, along with other members of the team will continue to look at these trends for the next few years, examining the effects that insecticides have on managed pollinators like honey bees or bumble bees that are often found near cucurbits. The goal is to provide guidelines for growers who want to employ more sustainable management practices in their farming operations. It

seems that a return to an old, and often neglected practice – IPM – may offer a solution.

If you have questions or would like to learn more contact at jpecenka@purdue.edu or check out the project's website for updates and information: pollinatorprotection.org



Figure 1. Honey bee visiting a male watermelon flower.



Figure 2. Example of research plot design; ½ acres of watermelons within a 15-acre corn field.

Striped Cucumber Beetles: Densities and Effective Scouting in Watermelons

(John Ternest, jternest@purdue.edu)

Striped cucumber beetle can be a significant pest in watermelon production systems. These pests can cause feeding damage to roots, stems, leaves, and flowers of plants as well as the watermelon fruit itself (Figure 1). In large enough densities, this damage can lead to economic loss. The economic threshold for striped cucumber beetles in watermelon has been set at 5 beetles per plant, since they are not susceptible to bacterial wilt. When densities of the beetles reach this level, growers should treat their fields with an insecticide to avoid yield loss. To make good decisions, pest densities should be determined with scouting.

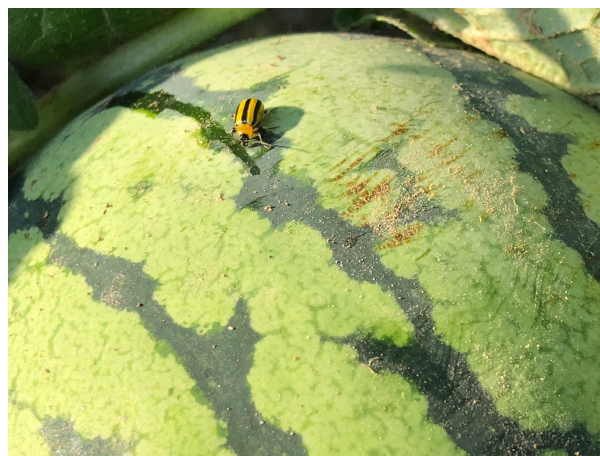


Figure 1. Striped cucumber beetle feeding on a watermelon.

To investigate the pressure of striped cucumber beetles on commercial watermelon fields in Indiana we worked with 16 growers during the summers of 2017-18. Fields ranged in size from less than half an acre to 100 acres. The growers used a variety of management strategies and insect scouting programs. This diversity of strategies among growers provided the opportunity to better understand the impact of striped cucumber beetles, the effectiveness of management, and grower management decisions. Over the two years of the study, beetles were sampled on plants weekly until flowering and bi-weekly thereafter, to assess densities. The average number of beetles per plant was calculated for each sampling date.

During the two-year study, a total of 5,000 individual plants were sampled across 30 fields. **No individual field ever reached threshold.** A variety of management tactics were used by this diverse group of growers, and all of them maintained the population density at low levels. Even the one organic field never reached the threshold, suggesting that much of the insecticide use by conventional growers was unnecessary. Fewer applications will reduce exposure to pollinators in the system and reduce input costs for the crop. The data presented in the previous article suggests that applying too many insecticides can result in reduced yields. These results are similar to those found in muskmelons several years ago. Yield tends to be the highest when fields are scouted and only treated when the threshold is reached.

We have developed a scouting plan that will effectively detect beetles in densities of 2-4 per plant with 75% confidence which is typical of scouting protocols. We recommend sampling between 8 and 15 randomly selected plants across the field on a weekly basis until flowering and bi-weekly thereafter. To do this, count beetles on 8-15 plants scattered around the field. An effective means of sampling can be to use transects which sample four plants at set distances that span the field; repeat transects at different locations to reach the desired number of plants scouted. If the average is 5 beetles/plant or greater, an insecticide should be applied. If densities are approaching threshold, fields should be scouted more frequently. In most fields, scouting will only take about 20- 45 minutes depending on number of plants sampled (8 or 15). The use of scouting information and thresholds can reduce insecticide use (cost), lower pollinator exposure to pesticides, and

potentially increase yields.

We Need Your Feedback on Veggie Rotations and Field Layouts

(Ian Kaplan, ikaplan@purdue.edu)

Crop rotation is a standard part of vegetable crop production. At its core, crop rotation is a management tactic meant to disrupt pest lifecycles and decrease the incidence of economically damaging infestations of insects and pathogens. However, surprisingly little scientific research appears to have explored which rotations are most effective for breaking pest lifecycles and increasing crop yield. Most vegetable production guides, for example, do not provide any specific rotations, and just provide the general advice: "Separate similar crops or families of crops as much as possible." If one digs around online, some rotations are recommended by some prominent organic vegetable growers, but the scientific justification of these rotations is not clear.

To better understand the value of diversity in crop rotations, researchers in the Departments of Entomology at Purdue and Penn State University are collaborating to explore how crop species relatedness influences pest populations in crop rotations. At the same time, we are also asking how crop species relatedness of adjacent plantings influences insect pests.

To properly address these questions, however, we need to establish the justification for current typical rotations and field layouts used by commercial vegetable growers. Therefore, we need feedback from as many commercial vegetable farmers as possible. To gather this feedback, we have established an online survey with 15 questions that should take someone less than 5 minutes to complete. The survey can be found here:

<https://docs.google.com/forms/d/1UJRcbOsdCPUCYtv1ybrtKHv-W4luf992YGVzok6OiU/edit?usp=sharing>

Thank you for providing your feedback!

Vegetable Disease Extension Bulletin

Two new versions of vegetable disease extension bulletins: Downy Mildew of Cucurbits and Fusarium Wilt of Watermelon are available. They can be downloaded at:

Downy Mildew of

Cucurbits: <https://mdc.itap.purdue.edu/item.asp?itemID=23207>

Fusarium Wilt of

Watermelon: <https://mdc.itap.purdue.edu/item.asp?itemID=23211>

Indiana Hort Congress—Vegetable Session

(Liz Maynard, emaynard@purdue.edu, (219) 548-3674)

Vegetable growers will find information-packed sessions at the Indiana Hort Congress next February. A few of the featured topics

are highlighted in this article. Visit inhortcongress.org to see the full schedule and register.

Climate will be the focus on Tuesday afternoon in a session sponsored by the USDA Midwest Climate Hub, Midwestern Regional Climate Center, and Purdue Extension. Climatologists and production specialists will take a look at existing climate and weather tools useful for Indiana vegetable and fruit growers. They will also generate discussion on what kinds of information about climate and weather would make planning and production easier in future. They will take results of that discussion back to the 'shop' to help plan future work. This will be an excellent opportunity to get up-to-date information about climate AND to help shape what kind of climate information is available and how you can get it in the future. Bring your wish list!

Watermelon Wednesday starts at 8:30 on February 13. Purdue entomologists have completed the first year of a major project investigating insect management and pollinators in watermelons. At Purdue Ag Centers around the state they took a close look at how insecticide application strategies affected honey bees, bumble bees, wild bees, as well as pests and yield. They looked at pollinators on commercial watermelon farms. Entomologists at Ohio State and Michigan State did similar work in pumpkins and cucumbers, and results from that work will be presented also. This is the place and time to learn about pollinators and pest management in cucurbits from the people who are spending hours looking closely and analyzing what they see. The session will wrap up with an update on best management practices for insect and mite pest management in watermelons based on the latest research.

After the morning break on Wednesday, invited speaker from Tennessee Dr. Annette Wszelaki will give us the latest about biodegradable mulches. A team across the country has been investigating new types of products in vegetable production. I think most growers agree that non-degradable plastic mulches are expensive and labor-intensive to remove, and disposal options can be expensive or problematic. Participants in this session will learn what researchers found about how the new mulches perform in the field, how well they degrade, which are suitable for certified organic production, and more.

Wednesday morning will wrap up with the latest recommendations for managing insects in sweet corn.

Wednesday afternoon features one of the most frequently suggested topics this year: biostimulants. Dr. Lori Hoagland from Purdue and Dr. Matt Ruark from Univ. of Wisconsin will team up to teach about microbial inoculants, protein hydrolysates, kelp, and other biostimulants. Growers thinking about whether, when, and which biostimulants to use will get information to inform their decision-making from scientists involved in researching the materials and how they work.

Thursday morning is the vegetable variety showcase. Speakers will cover pumpkins, tomatoes, watermelons, cantaloupe, peppers, summer squash and sweet corn. Produce Safety Alliance GAPS Training will also be provided on Thursday.

High Tunnel and Greenhouse Production session will be on

Tuesday, February 12. Topics include cover crops in high tunnels, high tunnel seedless cucumber production, fertility management, supplemental lighting and heating etc. A poster session will highlight graduate students' research in controlled environment agriculture.

Other sessions at IHC include Business and Marketing, Food Safety on Tuesday; Strawberries and Fruit on Wednesday, Raw Products on Wednesday, and Wine Grape on Tuesday and Wednesday. Private Applicator Recertification (PARP) Credits and Commercial Applicator CCH's will be available.

The Indiana Hort Congress luncheon will be on Wednesday, instead of Thursday as in previous years.

The Indiana Vegetable Growers Association annual membership meeting will be held Wednesday, February 13, at 3:30 to 4:30 pm.

The Trade Show will be open Tuesday afternoon through Thursday morning.

Hope to see you in Indianapolis at the 2019 IHC!

Upcoming Events

SWIM meeting * Parke Co. Veg. meeting * Illiana Veg Symposium
* Indiana Hort Congress * Small Farm Conference

Southwest Indiana Melon and Vegetable Growers' Technical Meeting

Date: November 15, 2018 5:00 pm to 8:00 pm (EST)

Location: Southwest Purdue Ag Center (SWPAC), 4369 N. Purdue Road, Vincennes, IN

The main focus of the Southwest Indiana Melon and Vegetable Growers' Technical Meeting is to discuss watermelon and cantaloupe varieties based on results of variety trials conducted at the Southwest Purdue Agricultural Center in 2018. The meeting will start at 5:00 pm for board members to discuss topics for the upcoming Southwest Indiana Melon and Vegetable Growers Annual Meeting, which will be held on March 8, 2019 in French Lick, IN. Any member who wants to participate in the discussion is welcome. At 6:00 pm, dinner will be served. Following that, we will showcase variety trials. Any grower interested in becoming a member is invited to attend. Membership dues are \$15 per year and can be paid at the meeting. To register please call (812) 886-0198. Registration is due by Nov. 7. Any questions, please contact Wenjing Guan guan40@purdue.edu



PrimusGFS v. 3 Training

Date: Dec. 5, 6, 7, 2018

Location: Southwest Purdue Ag Center, 4369 N. Purdue Road, Vincennes, IN 47591

This 3 day workshop will cover the newest version of the PrimusGFS audit scheme.

Registration fee is \$750 per person and will be available soon through the Safe Produce Indiana website (www.SafeProduceIN.com)

Parke County Vegetable Growers Meeting

Date: Dec. 12, 2018 9:30 to noon (EST)

Location: John Fisher Farm, 5191 East St Rd 236, Marshall IN 47872

Topics include timing of fungicide application and efficacy, cucumber production in greenhouse and high tunnels, and season extension with grafting. PARP credit will be provided.

Illiana Vegetable Growers Symposium

Date: January 8, 2019 8:00 am – 4:00 pm Central Time

Location: Teibel's restaurant in Schererville, IN.

Growers in NW Indiana and Northeast Illinois: Why not start the new year by attending the Illiana Vegetable Growers Symposium at Teibel's Restaurant in Schererville on Tuesday, January 8.

Speakers from Purdue and the University of Illinois will deliver talk in the day-long program, with luncheon provided by Teibel's. Topics include managing insects and pollinators in watermelons and diseases in pumpkins; getting a handle on the new worker protection standards; high tunnel cucumber production, urban farming, and an afternoon breakout session on pumpkins including basic production, varieties, cover crops and no-till systems.

Before presentations, during breaks, and over lunch there will be time to talk with vendors, network with other growers and Extension workers, and catch up with friends and neighbors.

Registration opens in late November. Visit

<http://tinyurl.com/ivgs2019> or contact Nikky at (219) 755-3240 to request a paper registration form. Registration for vendors is already open at <http://tinyurl.com/ivgs2019business>



Indiana Hort Congress & Trade Show

Date: Feb. 12-14 2019

Location: Indianapolis Marriott East, 7202 East 21st Street, Indianapolis, IN 46219

The Indiana Horticultural Congress is an educational meeting designed to meet the needs of fruit, vegetable, wine, organics and specialty crop growers and marketers in Indiana and surrounding states. All interested individuals are invited to

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attend. Registration opens in November 1.

Visit www.inhortcongress.org for more information, or contact Lori Jolly-Brown at (765) 494-1296 or ljollybr@purdue.edu.

2019 Indiana Small Farm Conference

Date: Feb. 28 to March 2, 2019

Location: Hendricks County Fairgrounds in Danville, Indiana

At the 2019 Indiana Small Farm Conference, you can:

- Learn from leaders and experts at workshops and breakout sessions
- Enjoy keynote talks from [Michael Phillips](#) of Lost Nation Orchard and [Karen Washington](#) of Rise & Root Farm
- Join discussions and demonstrations of what's new and what's next
- Attend a trade show with 50+ vendors of equipment, marketing, and more
- Network with fellow farmers to cultivate Indiana's small-farm community

Online registration opens December 3 at purdue.ag/sfc For additional information, visit purdue.ag/sfc or call (888) EXT-INFO

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2019 Vegetable Crops Hotline Subscription Form

The *Vegetable Crops Hotline* newsletter provides the commercial vegetable grower with timely information about disease, insect and weed pests, fertility practices, post-harvest problems, pesticide label changes, meetings and much more. Each year, the *Hotline* is published 12 times during the growing season (April - September) with additional issues in February, March and October.

In addition to the regularly scheduled issues of the *Hotline*, subscribers will be emailed articles published between issues about pressing matters. Growers may also use this form to sign-up for Veggie Texts. These texts, which will be of 160 characters or less, will deliver critical information to mobile phone numbers or email addresses.

This year we will offer 3 subscription options: 1 year for \$15 / 2 years for \$25 / 3 years for \$30

Yes, I would like to subscribe to the 2019 *Vegetable Crops Hotline*. Enclosed is a check made payable to **Purdue University**. (one year \$15, two years \$25 or three years \$30)

Mail to: Vegetable Crops Hotline Subscription
Southwest Purdue Ag Program
4369 North Purdue Road
Vincennes, IN 47591

***** (Please complete the following) *****

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ (home) and/or _____ (work)

____ **Yes, I would like to receive Veggie Texts.** Please provide your cell phone number and provider or an email address:

Cell Phone: _____

Carrier: (eg: Verizon, AT&T) _____

Email address: _____

If you would like to receive free email notification when a new issue of the *Vegetable Crops Hotline* is published online, please give us your email address or visit lists.purdue.edu/mailman/listinfo/vch to sign up: E-Mail address: _____

Indiana Vegetable Growers Association

Membership Renewal/Application

To renew or join, fill out the form below and send in with your check payable to IVGA. Memberships run January – December.

Your contact information will be included in the membership directory and used for IVGA correspondence.

Name: _____

Company: _____

Address: _____

City, State, Zip: _____

Tel: _____ Fax: _____

Email: _____

Web: _____

Would you like to receive **free subscriptions** to trade magazines that may be offered to IVGA members? If yes, we will provide your address to publishers who offer this. ☐ Yes ☐ No

Payment Form

Membership Dues

Regular, \$20/year \$____.00

Industry/Corporate, \$80/year \$____.00

Publications

Midwest Vegetable Production Guide ID-56,
\$15 each. \$____.00

Postage if mailed to you \$5 \$____.00

Vegetable Crops Hotline, \$15 for hard copy \$____.00

Vegetable Crops Hotline, email notice
check here to receive email _____ \$0.00

Total Due \$____.00

Make check payable to:

Indiana Vegetable Growers Association (IVGA).

Return to:

Indiana Vegetable Growers Association

PO Box 1321

Valparaiso, IN 46384-1321

Questions? Call 219-508-1429 or email ivga@ivga.org

Office Use Only: Check no. _____ Check Date _____

Date Received: _____ Received by: _____