# VEGETABLE CROPS HOTLINE

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



Issue: 631 July 6, 2017

#### In This Issue

- Farewell to Dr. Steve Weller
- Hornworms
- Squash Bugs
- Corn Earworms
- Two-Spotted Spider Mite Control
- Striped Cucumber Beetles
- Caterpillars in High Tunnels
- Caterpillars on High Tunnel Tomatoes
- Foliar Disease of Cucurbit Update
- Blossom End Rot of Tomato and Pepper
- Manganese Toxicity on Cantaloupes
- Call for Sweet Corn for Tasting Event
- Upcoming Events

## Farewell to Dr. Steve Weller

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

Dr. Steve Weller, professor and extension weed scientist in the Dept. of Horticulture and Landscape Architecture is retiring from Purdue. I'm sure many readers share the Purdue Vegetable Extension team's appreciation for all the work he has done to help vegetable growers with weed management and wish him the best in life's next adventures. Thanks from all of us, Steve! You will be missed.



## Hornworms

(Rick Foster, fosterre@purdue.edu, (765) 494-9572)

One of the most impressive insect pests that we deal with on vegetables are the hornworms (Figure 1 and 2). These two species, tomato and tobacco hornworm, can reach up to 4 inches long and consume massive quantities of foliage and fruit. In recent years, we have seen damage in high tunnels that is more serious than we normally see in field situations. The good news is that despite their size, hornworms are relatively easy to kill. A wide variety of insecticides will control them. See pages 143-44 in the *Midwest Vegetable Production Guide* for choices. As with most pests, it is better to treat when the hornworms are small because they are easier to kill and because you can avoid most of their damage. Hornworm damage is usually fairly easy to see, either because of the defoliation or the frass (insect poop) that they leave behind. So, scout regularly and control them early.



Figure 1 and 2. Hornworm feeding on tomato leaves in a high tunnel above. Damage below. (photo by Wenjing Guan)



## Squash Bugs

#### (Rick Foster, fosterre@purdue.edu, (765) 494-9572)

Squash bug is the most consistent insect pest of squash and pumpkins and is the most difficult to control (Figure 1 and 2). The key to management is early detection and control of the nymphs. The adults are extremely difficult to kill. Foliar insecticides should be applied to control the nymphs when you have more than an average of one egg mass per plant. When you find egg masses, mark them with flags and check every day or two to see when they hatch. When many of the egg masses are hatching, that is the time to begin application. Since eggs are laid and hatch over an extended period of time, several applications may be required. Brigade<sup>®</sup>, Mustang Max<sup>®</sup> and Warrior<sup>®</sup> have provided excellent control.



Figure 1. Squash bug and its eggs (photo by John Obermeyer)



Figure 2. Squash bug nymphs (photo by John Obermeyer)

## Corn Earworms

(Rick Foster, fosterre@purdue.edu, (765) 494-9572)

The first generation flight of corn earworm moths continues throughout the state. Heaviest populations as evidenced by pheromone trap catches have been in the northwest. This first generation flight should be ending soon. Then we will likely have a lull in catches for a while (several weeks) until the second generation emerges or we get a migratory flight from the southern US. To check moth catches in your area, please visit https://extension.entm.purdue.edu/cornearworm/index\_doc.html. Remember that sweet corn that silks prior to silking in the dent corn near your sweet corn field is much more vulnerable to egg laying from the moths. That's why we recommend spraying if your sweet corn is silking and you catch any moths in your trap. Once the neighboring dent corn begins silking, that corn will be just as attractive to moths for laying eggs as your sweet corn, so the amount of egg laying is diluted. As a result, during this period of time, we recommend that you don't spray unless your sweet corn is silking and you are catching at least 10 moths per night in the trap. The timing of dent corn silking often coincides with the interval between generations of corn earworms when moth catches are quite low, often zero. This period of time is a great opportunity for growers to save the money and time that they would normally spend spraying their sweet corn since moth catches are low and sweet corn is less vulnerable to attack.

Later, after dent corn pollination has been completed, sweet corn will again become more attractive for egg laying, so we again reduce the spray threshold to 1 moth in the trap. This period of time usually coincides with either the emergence of the second generation or the arrival of migratory moths, often in very high numbers. As a result, these plantings of corn are often severely attacked by earworms, so growers need to be very vigilant in their spray programs to avoid serious losses.

Some growers are still using the pyrethroid insecticides for earworm control. If they work for you, that's fine. However, in most areas, there is a significant level of resistance in earworm populations to those products, so growers have been forced to switch to other, more expensive, alternatives. Currently, Coragen<sup>®</sup> and Radiant<sup>®</sup> are the best options for management of earworms.



Figure 1. Corn earworms

# **Two-Spotted Spider Mite Control**

(Laura Ingwell, lingwell@purdue.edu)

It is that time of year again, when the two-spotted spider mites

(*Tetranychus urticae*; TSSM, Figure 1), and other mite species, show up in full force and wreak havoc on fruit and vegetables. These pests are very inconspicuous and often go unnoticed until the resulting damage appears. For TSSM this includes the webbing produced on heavily infested leaves or to the more trained eye, the characteristic yellow speckles or mottled symptoms on the upper surface of the leaves (Figure 2 and 3). The mites can be found on the underside, feeding with their sucking mouthparts.



Figure 1. Eggs, larvae, nymphs and adult two- spotted spider mites. (Photo by J. Obermeyer)



Figure 2. Yellow speckles on the upper surface of cucumber leaves heavily infested by two-spotted spider mites.



Figure 3. Webbing produced on heavily infested cucumber leaves

#### by two-spotted spider mite.

Cucumber, especially in organic production, can be the most susceptible. However, this pest feeds on a wide range of plants including tomatoes, melons, peppers, strawberries, apples, pears and grapevines, as well as flowers and field crops. Regardless of your production technique, an intervention is almost always necessary to control TSSM. In high tunnels in particular, pest populations thrive under hot and dry conditions and can wipe out a crop in a couple short weeks if no control measures are taken. Here is the best advice that I can offer, from my own experiences of growing cucumbers in high tunnels for four years and consulting with some beneficial suppliers in the region:

If the infestation of TSSM is at the point where webbing is visible on some leaves, especially in high tunnels, chemical intervention is necessary before introducing beneficial predators. There are a variety of miticides that have been effective in the past, leading to control with only one application. We have used Portal® in the past, which has since been prohibited in greenhouses. Ones that are currently silent on the label, and therefore may be used in high tunnel production depending on your local interpretations, include Acramite®, Agri-Mek® and Oberon®. These products can be used in both cucumber and fruiting vegetables. An organic alternative may include various insecticidal soaps, which kill on contact so should be carefully applied to the underside of leaves where the pests are feeding.

If you are considering beneficials for control, there are a variety of predatory mites and a midge available for purchase. *Phytoseiulus persimilis* is a predatory mite that only feeds on TSSM and can be effective at getting an outbreak under control. They become less active at temperatures around 90-95°F. The predatory midge *Feltiella acarisuga* are available for purchase as pupae in plastic trays. They take about 3 weeks to establish in the crop and provide control of TSSM as well as other mite species. The larval form of this insect feed on the mites and can resemble syrphid fly larvae, which are common and feed on aphids. There are a variety of *Amblyseius* species, another predatory mite, that can establish and maintain long term control. The species that is most heat-tolerant and therefore suitable for high tunnels at this time is *Amblyseius californicus*. They remain active at temperatures up to 110°F.

## Striped Cucumber Beetles

(Rick Foster, fosterre@purdue.edu, (765) 494-9572)

In southern Indiana, we are between generations of striped cucumber beetles. That doesn't mean there are none out there, but numbers are lower than they were and lower than they will be. The second generation should be coming out soon. Northern areas are a little behind. The biggest concern we have with the first generation or overwintering cucumber beetles is their ability to feed on seedlings and to transmit the pathogen that causes bacterial wilt to cantaloupes and cucumbers. For the second generation, we are less concerned about bacterial wilt and more concerned about feeding damage to the fruit, particularly watermelons and cucumbers. If you are seeing beetle feeding on fruit, you should probably apply an insecticide to protect the fruit. If not, you are probably safe not spraying. For later planted pumpkins, the biggest concern is feeding on the plants in the seedling stage. Once the plants get larger, they are less susceptible to attack. Again, if feeding damage on the fruit is observed, treatment is recommended.



Figure 1. Cucumber beetle damage on cucumber fruit (photo by Wenjing Guan)

# Caterpillars in High Tunnels

(Rick Foster, fosterre@purdue.edu, (765) 494-9572)

When we first began working in high tunnels about 8 years ago, most of the popular literature said that the tunnels would provide protection from most insect pests, other than the usual greenhouse pests like aphids and mites. What we found very quickly is that that information was untrue. We found very high populations of a variety of insect pests within our high tunnels. Caterpillars of various types seem to be especially problematic in high tunnels. Our theory is that the moths fly into the tunnel and can't figure out how to escape, so the females just lay their eggs on the crop they can reach. The key to managing these caterpillars is regular scouting and treating early. For the crop you are growing, look for the products recommend in the *Midwest Vegetable Production Guide* for caterpillars, then check Table 16 on page 45 to see if it can be used in high tunnels.

## Caterpillars on High Tunnel Tomatoes

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

We are seeing small caterpillars feeding on tomato leaves in high tunnels at Pinney Purdue. The first sign may be feeding partially through the leaf, or 'windowpane' feeding, or small holes on the leaf. By turning the leaf over we find a yellowstriped armyworm or hornworm (Figures 1 and 2). In the morning, we find moths clustered along the hipboard at the top of the sidewall (Figure 3). See Rick Foster's articles in this issue for information on control.



Figure 1. Yellowstriped armyworm on tomato leaf (photo by Liz Maynard)



Figure 2. Hornworm on tomato leaf (photo by Liz Maynard)



Figure 3. European corn borer moth (right) in high tunnel (photo by Liz Maynard)

# Foliar Disease of Cucurbit Update

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

I have observed very few foliar diseases of cucurbits this season. However, I have had several worried phone calls about these diseases, so here is an update. Alternaria leaf blight-this disease is caused by a fungus that survives in crop residue. It usually is not an important disease. However, Alternaria can cause brown lesions with a ring-like structure in them. This disease is more important on cantaloupe. I have not observed this disease in 2017.

Anthracnose-after some effort, I have been able to start this disease in my own plots. Look for jagged, brown lesions on leaves and stems and pitted lesions on fruit. Except for my own experiments, I have not observed this disease in 2017.

Gummy stem blight-this disease does not seem to occur as often as anthracnose. However, this disease showed up uninvited in my research plots. I have not observed this disease in commercial fields. The fungus that causes gummy stem blight can survive in crop residue.

Powdery mildew-many different plants can get powdery mildew. However, this disease is usually pretty specific for a plant family. The powdery mildew that causes powdery mildew of cucurbits does not affect other plant families. It is more common to observe powdery mildew on cantaloupe than on watermelon. I have observed this disease on cantaloupe in a greenhouse.

Downy mildew- this disease has to overwinter on green cucurbit tissue. For example, it has to overwinter on the Gulf Coast or in greenhouses up north. This disease has not been observed in Indiana so far this season. It has been observed in southern Michigan and southern Kentucky. Downy mildew is caused by a fungus-like organism, not related to the organisms that cause Alternaria leaf blight, anthracnose, gummy stem blight or powdery mildew.

Phytophthora blight is caused by a fungus-like organism related to the microbe that causes downy mildew. However, Phytophthora blight survives well in the soil in the absence of a host. And the host range is large. Specialized fungicides should be considered for management of downy mildew and Phytophthora blight. While downy mildew has not been observed in Indiana, many fungicides that are used to manage for Phytophthora blight will also be helpful for downy mildew. Check the labels.

Fusarium wilt of watermelon-This disease causes the plant to wilt. Initially, only a portion of the plant may wilt. This disease often occurs shortly after the watermelon plant begins to run. This year, I have also observed Fusarium wilt on mature plants. It is possible to add the fungicide Proline<sup>®</sup> through the drip, but such a treatment is unlikely to help plants that are already wilting.

Bacterial wilt-This disease causes a wilt of cantaloupe, cucumber and, occasionally, pumpkin. Bacterial wilt is caused by a bacterium that is spread by the feeding of the cucumber beetle. Although it is possible to slow the spread of the disease by controlling the beetle, such a treatment is unlikely to help wilted plants. Even after the beetle feeding stops, it is possible to observe wilt from feeding that occured earlier.

Blossom End Rot of Tomato and Pepper

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

In the past few weeks, we have received several reports about blossom end rot on tomatoes and peppers as the crops start to set fruit. Blossom end rot is a physiological disorder (not an infectious disease) that commonly occurs on tomatoes and peppers. Initial symptoms of the physiological disorder include dark green or brown water-soaked leisure occurring on the bottom of the fruit (Figure 1).



Figure 1. Initial symptom of blossom end rot on a pepper.

The lesion then expands into sunken, leathery brown or black spots (Figure 2 and 3). In severe cases, the lesion can expand to half size of the fruit. The symptoms on tomatoes can be observed on fruit from fruit set to fruit the size of golf balls. Fruit on the same cluster tend to show symptoms simultaneously. On peppers, the symptoms are more likely appear during fruit expansion. The affected fruit often change color prematurely. Under moist conditions, opportunistic molds might develop on the affected tissues (Figure 4). Blossom end rot more often appears on the early setting fruit than fruit develop later in the season.



Figure 3. Blossom end rot of tomato.



Figure 4. Mold develops under moisture conditions

Blossom end rot is caused by a calcium deficiency at the bottom of the fruit. Low concentration of calcium in soil solution might contribute to the problem. In addition, factors that inhibit calcium uptake and prevent enough calcium from moving to the fruit can also cause symptoms. We often see blossom end rot occur on hot and sunny days. Two reasons explain this trend. First, water stress. Calcium must be moved to the fruit with water, if there is not enough water, it is hard for calcium to reach the bottom of tomato fruit, the furthest end from where water is taken. Another reason is that fruit are fast expanding under hot and sunny days. The supply of calcium may not be able to catch up the rate of fruit expansion. If the plant is not provided with enough water, particularly during fruit set and expansion, blossom end rot may become a problem. We also see the symptom occurs in high salinity soils. This is also related to water stress as high salt content in soil prevents plant water uptake. Unbalanced nutrient supply may cause blossom end rot as well. 9Since calcium, magnesium, potassium, and ammonium-nitrogen are all positively charged. Calcium update might be inhibited by oversupply of other cations (positively charged ions) in the soil.

Conduct soil tests and apply preplant fertilizers accordingly is very important to provide crops with a balanced nutrient supply, the first step to prevent the occurrence of blossom end rot. During the production season, doing plant tissue tests in the early season can help detecting potential calcium deficiency. Applying calcium through drip system can effectively correct the problem. Another important step to prevent blossom end rot is water management. Be sure crops are not suffering water stress particularly during fruit set and expansion. If blossom end rot shows on the developing fruit, there is no way to correct the problem on the affected fruit, and they lose marketable value. Growers often ask whether foliar sprays of calcium can help correct calcium deficiency in developing fruit. There is not a conclusive answer from scientific research. Theoretically, since calcium moves in the plant with water flow via the xylem, it is not likely calcium taken up by the leaves can move to developing fruit. When tomato fruit reach golf ball size, they have already developed a waxy outer layer that is almost impermeable to water. Therefore, it is also not likely that calcium can enter the fruit directly if they have started to expand.

## Manganese Toxicity on Cantaloupes

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198) & (Dan Egel, egel@purdue.edu, (812) 886-0198)

Manganese toxicity is a common problem for cantaloupes growing in sandy soils across southwestern Indiana. Because symptom of manganese toxicity can easily be confused with foliar diseases, growers may misdiagnose the problem and waste fungicides by spraying for nonexistent diseases. As we now know that manganese toxicity is a nutrient related disorder caused by low soil pH, it is important for growers to learn the symptom and address the problem in right directions.

Manganese toxicity can develop on both cantaloupes and watermelons. But the symptom is more often observed on cantaloupes as they are more sensitive to acid soil conditions than are watermelons. The symptom on cantaloupes is first noticed when light green to yellow color shows between the veins on older leaves (Figure 1). Look at the leaves toward the sun and you will notice the chlorosis is formed by numerous tiny light green to yellow pin-hole type spots growing together (Figure 2). As the affected tissue dies, yellow areas become necrosis (Figure 3). Affected leaves may stand erect after the entire leaflet has died and dried out (Figure 4). The rapid breakdown and death of older leaves dramatically reduces plant photosynthesis rate and may cause considerable yield loss (Figure 5).



Figure 1. Initial symptoms of manganese toxicity on cantaloupe leaves.



Figure 2. chlorosis of manganese toxicity is formed by numerous tiny pin-hole type spots growing together.



Figure 3. Necrosis lesions on the leaves affected by manganese toxicity.



Figure 4. Cantaloupe leaves affected by manganese toxicity may stand erect after the entire leaflet died and dried out.



Figure 5. Breakdown and death of older cantaloupe leaves caused by manganese toxicity.

Dr. James Simon and others noticed most of the foliar degeneration on cantaloupes occurred in the fields or sections of the fields with acid soils (pH  $\leq$ 5.5) back to 1980s. By conducting a comprehensive survey of soil pH, complimented with tissue analysis of cantaloupes growing in southwestern Indiana, Scientists confirmed that two nutrient elements that are out of desirable range cause the foliage injuries on cantaloupes in southwestern Indiana. One of them is Manganese. Manganese is most abundant in soils with high iron content such as the soils in southwestern Indiana. It exists in soil solution as either Mn<sup>2+</sup> or Mn<sup>3+</sup>. Plants take up manganese in the form of Mn<sup>2+</sup>. The proportion of exchangeable Mn<sup>2+</sup> increases dramatically as soil pH decreases, and the reaction is promoted in waterlogged soils.

The symptom was observed in cantaloupe research trials at the Southwest Purdue Ag. Center this year. The research plot where we have observed the symptom has initial pH of 5.6. The soil was limed with pelletized lime at the rate of 200 lbs per acre in the spring. After laying plastic, we experienced heavy rainfalls in the early May that resulted in flooding of the adjacent field. Four weeks after transplanting when the symptom was first observed, soil pH around the root zones of affected plants was 5.1. Manganese toxicity was observed in the cantaloupe variety trial this year, which provides us an opportunity to observe relative tolerance to the nutritional disorder of different varieties. Interestingly, we noticed that some of the long shelf-life cantaloupe varieties seem more susceptible to this physiological disorder than traditional eastern-type cantaloupes.

Properly limed the soil is essential to maintain soil pH in the desirable range during the season. Lime is recommended to be applied in the fall for full reaction. If manganese toxicity is detected during the season, there is not much we can do to alleviate the problem, especially when fertigation is not applicable. If the system is set up to apply fertigation through drip tapes, using fertilizers with nitrogen source from nitrate-nitrogen (calcium nitrate and potassium nitrate) instead of ammonium-nitrogen may help by increasing soil pH. Potassium carbonate can also raise soil pH. It is water soluble and can be applied through drip systems. However, as correcting soil pH can be a prolonged process, it may be too late to see a yield response in the current season if the symptom has already been noticed. Emphasis should be always placed on correcting soil pH problem prior to season starts.

# Call for Sweet Corn for Tasting Event

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



We are looking for sweet corn growers to participate in our 2017 Vegetable Field Day and Sweet Corn Tasting. Our field day on Aug. 15 at Pinney Purdue Ag Center in Wanatah, will feature tours of tomato production in moveable high tunnels, using both conventional and organic management systems. The event also will include walking tours of sweet corn and pumpkin variety trials, an overview of research findings about the opportunities available through high tunnels, and information about the NRCS program. Attendees will learn about managing pollinators; lowcost high tunnel structures for the home gardener; irrigation solutions; site and structure considerations for new high tunnel users; and finding, preserving, and preparing fresh produce. Private applicator recertification credits (PARP) are anticipated. This event includes a dinner and sweet corn variety tasting.

If you would be willing to donate 2 ½ dozen ears of corn, please contact Lyndsay to arrange pick-up/drop-off arrangements. Lyndsay Ploehn, Purdue Extension—Porter County, Agriculture & Natural Resources Educator. (219) 465-3555 or Iploehn@purdue.edu.

# **Upcoming Events**

Purdue Extension and Indiana University are collaborating to offer a series of field days featuring high tunnels. The events will be hosted July 18 at the Meigs Horticulture Research Farm in Lafayette; Aug. 10 at the Southwest Purdue Agricultural Center in Vincennes; Aug. 15 at the Pinney Purdue Agricultural Center in Wanatah; and Sept. 27 at the Hamilton County Extension Office and Full Hand Farm in Noblesville.

## Meigs Horticulture Research Farm High Tunnel Field Day

Date: Tuesday, July 18, 10 a.m.-1 p.m. (EDT)

Location: Meigs Horticulture Research Farm, 9101 S. 100 E, Lafayette, IN, 47909

**Registration:** Visit http://tinyurl.com/yc5lqvez or call (765) 494-1296

For more information, contact: Lori Jolly-Brown at (765) 494-1296 or ljollybr@purdue.edu

The field day at Meigs Horticulture Farm will focus on high tunnel production of cucurbit crops. It will feature tours of conventional and hydroponic high tunnel cucumber and melon production. The use of insect-exclusion screens to control cucumber beetles and bacterial wilt will be on display in the conventional high tunnel systems. Presentations on vegetable grafting and future research in tomato systems also will be included in the tour. Attendees will also have an opportunity to discuss current challenges and future directions of research areas for high tunnel production systems. Lunch will be provided.



Tuesday, July 18th 10AM-1PM (lunch provided) Meigs Horticulture Research Farm 9101 S. 100 E, Lafayette

Talks • Soilless production of melons in high tunnels • Augmentation Biological Control • Insect Exclusion Screens • Future research on soil health and tomato production

Tours + Hydroponic melon production • Insect exclusion screens in cucumber and melon production • Footprint for tomato research (new construction of 6 tunnels) Challenges & needs discussion



## Southwest Purdue Ag Center High Tunnel Tour

Date: Thursday, August 10, 7 p.m.-9 p.m. (EDT)

**Location**: Southwest Purdue Agricultural Center, 4669 North Purdue Road, Vincennes, IN, 47591

**Registration:** Visit http://tinyurl.com/yc5lqvez or call (812) 886-0198

For more information, contact: Wenjing Guan at guan40@purdue.edu or Dan Egel at egel@purdue.edu

During the evening event at Southwest Purdue Agricultural Center, attendees will see demonstrations of soil solarization, end-of-season clearance of soil covers, sprayers used for smallscale plots, and an innovative season-long low tunnel system for growing tomato and pepper. Attendees will also learn how to ID tomato diseases by walking in the field with a plant pathologist. A NRCS representative will share the insights about high tunnel cost-share program. We will also discuss issues relating to how to choose, locate and make pre-construction decisions for a high tunnel.



Tour is free, to register please visit <u>http://tinyuri.com/vc5igver</u> or call (812) 886-0198 For more information please contact: Dan Egel (<u>egel@purdue.edu</u>) or Wenjing Guan (<u>guan40@purdue.edu</u>)

## Pinney Purdue Vegetable and High Tunnel Field Day

Date: Tuesday, Aug. 15, 5 p.m. -8:30 p.m. (CDT)

**Location:** Pinney Purdue Agricultural Center, 11402 South County Line Road, Wanatah, IN 46390

**Registration:** Visit http://tinyurl.com/yc5lqvez or call (219) 386-5232

For more information, contact: Kym Schwinkendorf at kschwink@purdue.edu or (219) 386-5232.

The field day at Pinney Purdue Agricultural Center will feature tours of tomato production in moveable high tunnels, using both conventional and organic management systems. The event also will include walking tours of sweet corn and pumpkin variety trials, an overview of research findings about the opportunities available through high tunnels, and information about the NRCS program. Attendees will learn about managing pollinators; lowcost high tunnel structures for the home gardener; irrigation solutions; site and structure considerations for new high tunnel users; and finding, preserving and preparing fresh produce. Private applicator recertification credits (PARP) are anticipated. This event includes a dinner and sweet corn variety tasting.

## Purdue Beginning Farmer Program/Full Hand Farm Tour

Date: Wednesday, Sept. 27, 9 a.m. - 5 p.m. (EDT)

Locations: Hamilton County Extension Office (9 a.m. – 1 p.m), 2003 Pleasant St, Noblesville, Ind., 46060 and Full Hand Farm (1:30 p.m. – 3:30 p.m.), 3844 State Road 13 North, Noblesville, IN,

#### 46060

#### Registration: Visit http://bit.ly/2puUV4I

For more information, contact: James Wolff at 260-481-6434 or jmwolff@purdue.edu; or Analena Bruce at 412-716-5040 or anabruce@indiana.edu

This fall event, which is part of the Purdue Beginning Farmer Program, includes educational workshops on top considerations for site and high tunnel structure selection, and advice on managing pests that are common in high tunnels. During an afternoon tour at Full Hand Farm, attendees will observe a successful high tunnel operation that utilizes moveable high tunnel systems. Full Hand Farm is a diverse vegetable farm that produces winter salad greens and a variety of other specialty crops. Lunch will be provided to pre-registrants. Registration is limited.

It is the policy of the Purdue University that all persons have equal opportunity and access to its educational programs, services, activities, and facilities without regard to race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability or status as a veteran. Purdue is an Affirmative Action Institution. This material may be available in alternative formats. 1-888-EXT-INFO Disclaimer: Reference to products in this publication is not intended to be an endorsement to the exclusion of others which may have similar uses. Any person using products listed in this publication assumes full responsibility for their use in accordance with current directions of the manufacturer.

Vegetable Crops Hotline © Purdue University - vegcropshotline.org Editor: Wenjing Guan | Department of Horticulture and Landscape Architecture, 625 Agriculture Mall Dr., West Lafayette, IN 47907 | (812) 886-0198