

VEGETABLE CROPS HOTLINE

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



Issue: 667
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In This Issue

- [Time to Renew](#)
- [Broccoli under Heat Stress](#)
- [Alternaria Leaf Spot of Broccoli](#)
- [Wirestem of Broccoli](#)
- [High Tunnel Off-season Management](#)
- [Weed Science Updates](#)
- [Are you Interested in Growing Hemp? A Message from Purdue Hemp Extension Specialist](#)
- [Illiana Vegetable Growers Symposium](#)
- [Purdue Extension Food Safety Training Hub Open House](#)
- [Southwest Indiana Melon and Vegetable Growers Winter Meeting](#)
- [Indiana & NCRAC Water Quality Workshop](#)
- [Indiana Horticulture Conference and Expo](#)
- [Dates Announced for Produce Safety Alliance Grower Training](#)
- [Survey for Attitude, Knowledge, and Barriers towards Value-Adding Business](#)
- [Survey for Wildlife Damage](#)

4369 North Purdue Road, Vincennes, IN 47591). Thank you for helping us to improve the newsletter!

Broccoli under Heat Stress

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

Cool nights have finally arrived after the first week of October. Before, we had quite a few days when temperatures were above 90°F. The unusual high temperature has caused problems on early-planted broccoli.

Broccoli is a heat-sensitive crop. The critical period for heat sensitivity is when plants shift growing tips from vegetative growth to flower bud initiation. This is about 10 days before the crown is visible. Temperatures above 90°F during the critical period cause injury on the flower buds. As the crown continues to grow, an uneven head becomes noticeable, and these heads are inclined to be affected by pathogens. Another response broccoli often has toward the heat stress is to grow leaves in the head (Figure 1), although it may be less a concern compared to bud damage.

Time to Renew

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

This is the final issue of the *Vegetable Crops Hotline* (VCH) for 2019. 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 date 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,



Figure 1. Broccoli grows leaves in the head. A response toward heat stress (Photo by Luis A. Santiago)

Varieties are varied by heat sensitivity, and they may have slightly different responses toward high-temperature. For example, the very popular variety Emerald Crown tends to make leafy heads while being less susceptible to head unevenness compared to other popular conventional varieties. The organic variety Belstar handles high-temperatures the best among organic varieties.

How long does it take for the crop to reach the critical heat-sensitive window? Studies have found that it could happen within a month in the summer after transplanting. With that said, broccoli crops transplanted in late July or August may suffer heat stress this year.

The market potential is great for broccoli harvested in the early fall. This means crops would develop heads in late summer. The take-home message here is that growers should balance the risk of heat damage and the market potential for early broccoli production. Surely, sometimes, luck plays an important role.

We appreciate Dr. Thomas Björkman at Cornell University for providing valuable information for this article.

Alternaria Leaf Spot of Broccoli

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

This disease was recently observed in southern Indiana. Moderate damage to leaves in broccoli does not usually cause yield or quality loss. However, *Alternaria* leaf spot may also affect Chinese cabbage, bok choy and leafy brassicas such as cabbage.

The most common symptom is a leaf spot (Figure 1). The lesions start out small; as lesions become larger they may have a light brown border with a light gray center. Lesions may also occur on leaf petioles. Under conducive conditions, some defoliation may occur, affecting the size or quality of broccoli heads. In severe cases, broccoli heads may be affected by this disease (See article in this issue about heat damage to broccoli heads).



Figure 1. *Alternaria* leaf spot of broccoli may cause a round lesion with a light brown border and a gray center.

There are two species of the fungus that may cause *Alternaria* leaf spot. The species that was isolated recently (*Alternaria brassicicola*) is favored by temperatures from 68 to 86°F and 12 hours of 90% relative humidity. In southern Indiana, we have had a relatively warm and dry late summer and fall. However, dew periods in combination with overhead irrigations and light rains may be conducive to this disease.

The fungus that causes *Alternaria* leaf spot of broccoli may survive in crop residue. Therefore, crop rotation and fall tillage will help to lessen the severity of this disease. No-tillage systems may increase the severity of *Alternaria* leaf spot of broccoli. Some cultivars are more susceptible to this disease than others; pay

close attention to differences in disease severity among cultivars and discuss this disease with your seed representative. In addition, this disease may be transmitted in seed.

Foliar fungicides may help to reduce the severity of *Alternaria* leaf spot although light infections may not require fungicides. The *Midwest Vegetable Production Guide for Commercial Growers* lists several recommended products. These include: products with the active ingredient azoxystrobin (e.g., Quadris®, Satori® and Quadris Top® with difenconazole); Cabrio EG; several products with chlorothalonil as an active ingredient (e.g., Bravo®, Echo®, Equus®, Initiate®); Endura®; Fontelis®; Inspire Super®; Reason 500SC®; Switch 62.5 WG®.

Wirestem of Broccoli

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

The fungus *Rhizoctonia* can be a nuisance to many vegetable growers. Readers may recognize this unusual name as a cause of many diseases such as damping off and root rot in many different crops. This article is about *Rhizoctonia* as the cause of wirestem in broccoli.

Rhizoctonia may affect several brassica crops such as broccoli, cauliflower, Chinese cabbage and radish. Recently, a disease known as wirestem was observed on broccoli. The first symptoms that growers are likely to observe is a wilt of very young broccoli plants. When the plants are examined more closely, it can be observed that the stem has rotted away, as if to a wire (Figure 1). This can cause the plant to wilt and collapse.



Figure 1. Wirestem of broccoli. The stem has been washed and the discolored tissue has mostly been removed.

The *Rhizoctonia* fungus may survive in the soil for long periods without a host. And, as mentioned above, the fungus has many hosts. *Rhizoctonia* diseases are favored by warm soil temperature (above 68°F) and wet conditions.

When direct seeding, fungicide treated seed is an option that may lessen wirestem severity. When transplanting, avoid transplanting

too deep. Avoid brassica crops in crop rotations. Deep tillage practices which reduce crop residue may help to lessen disease. Products with the active ingredient pentachloronitrobenzene (PCNB) (e.g., Blocker 4F®) applied at planting are labeled for wirestem of broccoli. It is difficult to predict, however, when or if such a treatment is warranted.

High Tunnel Off-season Management

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

Although high tunnels make it possible for Indiana farmers to grow vegetables year-round, many growers may choose to end the production season in the fall. After a busy summer, it is not unusual that off-season management is overlooked. Nevertheless, these good management practices determine the success of the next year. It is an old lesson, but we can never put too much emphasis on the importance of good management practices during the off-season.

1. **Terminate plants after final harvest, and remove crop residues out of the tunnel.** The worst scenario I have ever seen was a high tunnel full of weeds in late fall, and a few tomato plants still standing in the middle of the weeds. No doubt, the plant materials provide a cozy environment for insect pests to survive the winter. Under the ground, the roots of tomato plants, as well as roots of several weeds continue to feed plant parasitic nematodes, helping them survive the winter. It is not difficult to imagine that all the pests are ready to multiply and attack the new crop when it is planted next year. The best practice is to terminate crops after final harvest as soon as possible. Clean all the leaves, stems, dropped fruit, and pull up plant roots as far as you can. As Dr. Dan Egel always says, remove the plant residue as far away from the high tunnel as possible. Not only the plant materials, but also the trellises system like tomato stakes should also be removed and sanitized.
2. **Keep high tunnel open during the coldest time of the winter.** The idea is to allow low temperatures to kill pests. It is true that the lowest temperature inside the high tunnel is not that much different as the lowest temperatures outside. A closed high tunnel can bring temperatures back quickly after the sun is up. Keep in mind that not just the threshold temperature, but also how long the pests are exposed to the threshold temperatures kill pests. When the tunnels are open, do not forget to watch for strong winds.
3. **Expose soil to natural rain and snow.** If it is time to change plastic, do this during the off-season, and allow plenty time before installing the new plastic, so the natural rain and snow can wash excessive salt off of the top soil. If you do not have a plan to change the plastic, there is still chance to get a decent amount of snow covering the soil if the sides of the high tunnels are wide open.
4. **Adjust soil pH if it is needed.** Out-of-chart soil pH leads to many problems in crop production, while it is one of the

most difficult issues to be addressed during the growing season, especially for organic production. Due to irrigation water quality, we saw a trend of increased soil pH in the high tunnel after multiple years of crop production in Indiana. If this happens, you may want to consider adding sulfur to bring soil pH down. The general rule is to add 2 lbs elemental sulfur per 100 square feet to bring soil pH from 7.5 to 6.5 depending on soil types. The way sulfur works is through a biological process: bacteria in the soil converts elemental sulfur to sulfuric acid, which reduces soil pH. Because microorganisms are involved, soil conditions such as temperature determine how effective this process is, and the conversion process takes time.

Last note, vegetables differ in their sensitivity to high salts and high pH. Among the most widely grown crops in high tunnels, tomatoes in general are more tolerant to adverse soil conditions than cucumbers and peppers. That's probably why growers may not realize they have soil problems until they start to grow cucumbers and peppers in a high tunnel that used to grow tomatoes.

Weed Science Updates

(Stephen Meyers, slmeyers@purdue.edu, (765) 496-6540)

As the production season winds down there are two weed-related news items that producers should be aware of:

New Requirements for Users of Paraquat Herbicide.

Paraquat dichloride is the active ingredient in products such as Gramoxone®, Devour®, Cyclone®, and Quik-Quat®. Earlier this year the Environmental Protection Agency (EPA) announced the following changes to paraquat requirements:

1. Additional labeling requirements and the distribution of supplemental warning materials at the point-of-purchase are now required and highlight the toxicity and risks associated with paraquat products.
2. Paraquat use is now restricted to certified applicators only. No longer can an uncertified handler use paraquat, even under the direct supervision of a certified applicator.
3. Specialized, approved paraquat training is now required for anyone who will mix, load, apply, or handle paraquat.
4. New, closed-system packaging will be used to prevent the transfer or removal of paraquat into unapproved containers or equipment.

These changes were sparked by unnecessary deaths of individuals who consumed paraquat which had been illegally poured into drink containers. Three of these deaths were children. Paraquat is highly toxic. Please, make no mistake about it, one sip of concentrated paraquat is nearly always fatal.

Prior to writing this newsletter article, I took the EPA-approved paraquat training. It consists of a 30 minute video followed by a 15 question quiz. The video is well-made, informative, and its content is a good refresher for how to safely handle all pesticides—even though its focus is paraquat. All 15 questions of the quiz

must be answered correctly to pass. However, the quiz can be taken as many times as necessary to pass with no required waiting time before reattempting. For more information and a link to the EPA-approved paraquat training, please visit the EPA website here:

<https://www.epa.gov/pesticide-worker-safety/paraquat-dichloride-training-certified-applicators>

Updates to Indiana's Noxious Weed List. On September 18, 2019 the Office of the Indiana State Chemist received approval to add weedy amaranth species to its list of restricted noxious-weed seeds. This means that weeds such as Palmer amaranth, waterhemp, and other weedy pigweeds will now be subject to restrictions under the state's seed law. The restriction will not apply to *Amaranthus* species sold as vegetables, ornamentals, or edible grains for human consumption. According to state seed law, "It is unlawful for any person to distribute agricultural seeds if the seed consists of or contains restricted noxious-weed seeds in excess of 0.25%, or if it contains more than 2.5% of all weed seeds. If less than 0.25% of such weed seeds by weight are present, the number per pound must be declared on the labeling." Indiana joins Iowa, Minnesota, North Dakota, Tennessee, Washington, and Wisconsin in designating Palmer amaranth as a noxious-weed seed species. Wisconsin also recognizes waterhemp as a noxious-weed seed species. The official update to the Indiana noxious-weed seed list will be October 18, 2019 with enforcement starting January 1, 2020.



The author stands next to a Palmer amaranth plant in sweet potato research plots in North Carolina, 2007

Are you Interested in Growing Hemp? A Message from Purdue Hemp Extension Specialist

(Marguerite Bolt, mbolt@purdue.edu)

I am a Northern Michigan native that grew up on a specialty crops farm where I spent many days outdoors playing in the field and

helping my family plant and harvest crops. I pursued a bachelor's in Entomology at Michigan State University and received my degree in 2015. While I was at MSU, I spent three summers working as a field technician at the Northwest Michigan Horticulture Research Center conducting research on chemical and non-chemical techniques to reduce insect pests in sweet and tart cherries, apples, and wine grapes. I then spent a year working as a commercial beekeeper before moving to West Lafayette to pursue a master's degree in Entomology with Dr. John Couture. My research project focused on the influence of agronomic management practices on hemp-insect interactions. I have thoroughly enjoyed working with hemp over the last two years and I am excited that I was given the opportunity to continue my work on this crop.

My goal as the new hemp Extension specialist for Purdue is to design a hemp program that provides the informational groundwork for prospective commercial hemp producers through public meetings, online webinars, field days, workshops, and guides. This summer there were several hemp field days hosted at Purdue Agricultural Centers and on private hemp farms. These events attracted hundreds of current and prospective growers, which demonstrated a need for active involvement from Purdue and Purdue Extension. Now that the outdoor growing season has wrapped up for hemp farmers, there are some upcoming events to look forward to. There are several large events coming up in the Indianapolis area this fall and winter. Hemp at the Crossroads will take place November 16-17 at Marriott East hotel in Indianapolis and is organized by the Midwest Hemp Council. This two-day conference will feature talks on regulatory issues, business and marketing, and hemp production, and will include an expo hall. To learn more and register for this event, please visit <https://www.hempatthecrossroads.com/>. Farm Journal will be putting on a Hemp College in Indianapolis on December 16. Previous Farm Journal events have attracted hundreds of attendees and have a lineup of great speakers. To learn more and register for this event, please visit <https://www.agweb.com/events/hemp-college>. The next big event hosted by Purdue will be the Indiana Horticulture Conference and Expo. This three-day conference will feature a hemp track with talks focused on regulatory and license information, pest management, and production guidelines. This event will take place February 11-13 at the Marriott East hotel in Indianapolis. To learn more, please visit <https://www.indianahortconference.org/>. There will be county and regional Extension meetings around the state throughout the winter and spring months. Look for these on the Purdue Extension website and the Purdue Hemp website and Facebook page. I am looking forward to working with hemp farmers across Indiana and can be reached through hemp@purdue.edu or at (765) 496-1567.

Illiana Vegetable Growers Symposium

(Nikky Witkowski, nikky@purdue.edu, (219) 465-3555)

The Illiana Vegetable Growers Symposium will be held Tuesday, January 7, 2020, from 8:00 a.m. to 4:00 p.m. Central Time, at Teibel's Restaurant in Schererville, Indiana. This symposium, sponsored by Purdue Extension and University of Illinois Cooperative Extension Service, offers commercial vegetable growers and market farmers opportunities to learn more about pest management, production practices, variety selection, and marketing; visit with vendors; and network with other growers.

Information about registration and more details about the program content will be available online in November at puext.in/IVGS. For more information regarding the program, contact Nikky Witkowski at (219) 465-3555, or at nikky@purdue.edu.



Purdue Extension Food Safety Training Hub Open House

(Scott Monroe, jsmonroe@purdue.edu, (812) 886-0198)

Please join us for the grand opening of the Purdue Extension Food Safety Training Hub, located in the newly constructed Vincennes University Agricultural Center. Located on Highway 41 adjacent to SWPAC, the new facility features lab and office space, a large postharvest research area, classroom and audio-visual room for use in food safety programming.

The event will be held on November 4 from 3:00 - 5:00 pm and will include guided tours, as well as remarks from individuals involved in the project. Light refreshments will be served. Those attending are asked to RSVP at

<http://bit.ly/FoodSafetyGrandOpening> by October 21.



Southwest Indiana Melon and Vegetable Growers Winter Meeting

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

Date: November 14, 2019 5:00 pm (EST)

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

This event is a great opportunity to learn about watermelon, cantaloupe and other specialty melon production regardless if you have been growing watermelon all your life or are new to this crop. The meeting will start at 5:00 pm with a casual discussion about this production season. We will solicit topics for the upcoming Southwest Indiana Melon and Vegetable Growers Annual Meeting, which will be held in French Lick, IN on March 6, 2020. At 6:00 pm, dinner will be served. Following the meal, we will present the variety trial results including 40 seedless watermelons, 18 personal-size watermelons and 30 varieties of cantaloupe and specialty melons.

Any grower interested in becoming a member is invited to attend the meeting. Membership dues are \$15 per year and can be paid at this meeting, if they were not paid at the spring meeting in March 2019. The annual membership dues covers the registration fee for both the spring meeting in March as well as the winter meeting, and are typically due in March.

To register please call (812) 886-0198. Registration is due by Nov. 7. Any questions, please contact Wenjing Guan at guan40@purdue.edu

Save the Date
Southwest Indiana Melon & Vegetable Growers
Winter Meeting
November 14, 2019 5:00 PM
Southwest Purdue Ag Center, Vincennes, IN
(HWY 41 North of Vincennes)

For more information, contact the
Southwest Purdue Ag Program
812-886-0198



Indiana & NCRAC Water Quality Workshop

Date: October 26, 2019 8:30 am sign-in

Location: Elkhart County Fairgrounds 17746 County Rd. 34, Goshen, IN 46528 Home and Family Arts Building

This one-day hands-on workshop will offer a view into aquaculture and aquaponics water quality parameters and considerations. The day will consist of information that will benefit new and established producers.

More information about the event and registration:
indianaaquaculture.com/shop

14. Poster ^{NEW}

*The Organic track will not be presented as a stand-alone track. Presentations will be incorporated in other existing tracks.

Visit us at www.indianahortconference.org for more information. The conference schedule will be available on November 1, 2019 and registration will open on the same day. Register before November 27, 2019 to benefit from our discounted early bird registration fee.



Indiana Horticulture Conference and Expo

(Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955) & (Kyle Daniel, daniel38@purdue.edu)

We are pleased to announce that the 2020 Indiana Horticultural Conference & Expo (previously known as the Indiana Horticultural Congress) will be from **February 11 through 13, 2020** at the Indianapolis Marriott East Hotel, located in Indianapolis, IN. There are numerous and very exciting changes that will occur at IHC 2020. Additional tracks are added to the already great lineup of previous years. New tracks such as Urban Agriculture, Hemp Production, Agronomic Crops, and Woman in Agriculture will create additional opportunities to serve our audience. A targeted selection of educational tracks, a joint plenary session, a diverse set of expo vendors and ample opportunities for networking will set the stage for a great conference. A trade show lounge featuring coffee and couches will allow an abundance of networking opportunities with fellow Indiana and other Midwestern farmers and vendors.

Educational Tracks

1. Wine Grape
2. Food Safety
3. Fresh Vegetables
4. Organics*
5. Raw Products
6. Fruit
7. Greenhouse / High Tunnel Production
8. Business / Marketing / AgriTourism / Succession Planning
9. Joint Plenary Session ^{NEW}
10. Hemp ^{NEW}
11. Agronomic Crop Production ^{NEW}
12. Woman in Agriculture ^{NEW}
13. Urban Agriculture ^{NEW}

Dates Announced for Produce Safety Alliance Grower Training

(Scott Monroe, jmonroe@purdue.edu, (812) 886-0198) & (Amanda J Deering, adeering@purdue.edu)

Beginning this month, Purdue Extension will offer produce food safety trainings throughout Indiana. The trainings utilize the Produce Safety Alliance (PSA) training curriculum and will be offered at multiple locations across the state.

For produce farms that are covered under the Food Safety Modernization Act Produce Safety Rule, at least one manager or responsible person is required to receive food safety training equivalent to FDA's standardized curriculum. Completion of a PSA grower training is one way to meet that requirement.

For growers who are not covered by the Produce Safety Rule, the trainings are an excellent introduction to produce food safety and will be useful to those who are beginning to develop a food safety program on their farm, or who want to learn more about this topic.

There are currently 6 offerings across the state. Classes are from 9:00 am - 5:00 pm. Cost is \$100. This includes a curriculum manual, certificate of completion, and lunch. Participants may register for any location by going to www.SafeProduceIN.com and clicking on the "Get Trained" option.

In addition to the scheduled classes, groups of growers may request additional trainings by contacting Scott Monroe (jmonroe@purdue.edu) or Amanda Deering (adeering@purdue.edu). Additional class offerings will be posted on the Safe Produce Indiana website as they are scheduled. Current offerings for 2019-20 are:

November 15, 2019

Purdue Extension Food Safety Training Hub (located in the

Vincennes University Agricultural Center).

4207 N. Purdue Rd. Vincennes, IN 47591

Start Date: Friday November 15, 2019 | Start Time: 9:00 AM | End Time: 5:00 PM All Times Eastern

December 20, 2019

Harrison County -Purdue Harrison County Extension Office

247 Atwood St, Corydon IN 47112

Start Date: Friday December 20, 2019 | Start Time: 9:00 AM | End Time: 5:00 PM All Times Eastern

January 17, 2020

Porter County-Pinney Purdue Agricultural

11402 S. County Line Rd, Wanatah IN 46390

Start Date: Friday January 17, 2020 | Start Time: 9:00 AM | End Time: 5:00 PM All Times Eastern

February 10, 2020

Marion County – Hort Congress- Indianapolis Marriott East Hotel

7202 East 21st Street, Indianapolis IN 46219

Start Date: Monday February 1, 2020 | Start Time: 9:00 AM | End Time: 5:00 PM All Times Eastern

March 20, 2020

Lagrange County – Location TBA

Start Date: Friday March 20, 2020 | Start Time: 9:00 AM | End Time: 5:00 PM All Times Eastern

April 7, 2020

Ivy Tech-Richmond McDaniel Hall

2357 Chester Blvd., Richmond IN 47374

Start Date: Tuesday April 7, 2020 | Start Time: 9:00 AM | End Time: 5:00 PM All Times Eastern

Survey for Attitude, Knowledge, and Barriers towards Value-Adding Business

(Han Chen, chen2401@purdue.edu)

Have you thought about producing your own value-added products (value-added: further process fresh produce to increase its value)? What's the challenges for you to start or scale up your own value-adding business?

We would like to invite you to participate in the study "Attitude, Knowledge, and Barriers towards Value-Adding Business among Indiana Fruit and Vegetable Growers". We are interested in learning about your perspective and experiences. Your feedback will be very valuable for us to develop better food safety curriculum for value-adding business that address your

challenges. All the responses will be kept confidential.

We have two projects that you can participate in:

- Online Survey: this survey mainly focuses on understanding your attitude and experience on value-adding production, and your barriers to building value-adding process. You can participate in this project if you are **Fruit and/or Vegetable Grower**. You do not need to have a value-adding business!

Please help us by completing this survey:

https://purdue.ca1.qualtrics.com/jfe/form/SV_dcnfjzLZu39fD

If you enter your e-mail address in the last survey question, you will have a chance to receive \$35 monetary reward. The winner will be notified via e-mail.

- Focus group: this will be a one-time 2-hour session that you will share your thought and/or experience on value-adding business with a small group of farmers. You can participate in this project if you are **Fruit and/or Vegetable Grower**. But you do not need to have a value-adding business to participate in the focus group. We will assign you to the focus group based on your background information.

All the participants will receive \$100 monetary incentives as a token of thank you! The location of focus group will be determined based on the preferred location of each participant.

You can participate in one or both two projects. Here is the link that you can sign up for the focus group:

https://purdue.ca1.qualtrics.com/jfe/form/SV_OwTlHssHS84MuYI

If you have any questions, please feel free to contact me at chen2401@purdue.edu or (317) 970-6827

Thank you for your time!

Purdue University
Farmers Food Safety Education Research Study
Will you share with us your farming story?

What is the purpose of this study?

We want to gain a deeper understanding of your attitude towards value-adding business and your barriers to enter the value-added business or to scale up your business in order to develop better educational materials and activities for you and other farmers

Who is eligible?

Produce growers

What will participants do?

- ❖ Participate in 2-hour focus group
- ❖ Share your farming experience and thoughts

Potential benefit?

\$100 monetary incentive will be provided for each household

Interview location?

Interview location will be determined depending on your convenience

All your information will be kept confidential!

Interested?

Please contact Han Chen at chen2401@purdue.edu or (317)970-6827



Survey for Wildlife Damage

Agricultural producers face a plethora of wildlife issues on the farm, from biosecurity in animal agriculture to food safety requirements for fresh produce farmers. Many wildlife species have social or economic value and may be regulated or protected,

constraining timely mitigation strategies. Additionally, research and science-based management recommendations to help farmers address wildlife on the farm are limited, available for some crops and pest species but not others.

The last national [United States Department of Agriculture \(USDA\)](#) survey of U.S. wildlife damage to agriculture took place in 2001 and estimated \$944 million in losses. At the national level, primary wildlife species resulting in losses to field crops included deer, turkeys, raccoons and waterfowl (collectively 75% of the reported losses), with 22% attributed to other species. For vegetables, fruits and nuts, deer, ground squirrels and other small rodents, crows, raccoons and rabbits were most frequently reported (64%), with other species accounting for 36% of the reported losses. All of these species have the potential to significantly impact agriculture in the Midwest as they are generally abundant and widespread in agriculture-dominated

landscapes.

In an effort to identify and address agriculture and wildlife priorities in Michigan, Michigan State University has developed a [brief survey](#) (less than 3 minutes) and are asking all farmers to participate. The results of the survey will drive future research and mitigation efforts.

Take the survey

at: https://msu.co1.qualtrics.com/jfe/form/SV_bxRihLjhPa5EkuN

The survey is tablet- and mobile-friendly.

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Editor: Wenjing Guan | Department of Horticulture and Landscape Architecture, 625 Agriculture Mall Dr., West Lafayette, IN 47907 | (812) 886-0198

2020 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 2020 *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: _____