

# VEGETABLE CROPS HOTLINE

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

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## From The Editor's Desk

(Petrus Langenhoven, [plangenh@purdue.edu](mailto:plangenh@purdue.edu), (765) 496-7955)

Welcome to the [Vegetable Crops Hotline](#) (VCH), Purdue Extension's exclusive newsletter for people in the business of growing vegetables.

This issue features our insect and weed spotlight articles. We also examine June-bearing strawberries and the weather and get updates on auction prices from the Clearspring Produce Auction. The newsletter also includes updates regarding upcoming field days. The program for the July 18 Purdue Fruit and Vegetable Field Day is now available!

### Timeless Articles

Timeless articles include articles published by Dan Egel, who is now retired from Purdue University.

**Time to Scout for Squash Vine Borer (SVB).** Issue 691.

<https://vegcropshotline.org/article/time-to-scout-for-squash-vine-borer-svb/>

**Tomato Bacterial Diseases — Bacterial Canker.** Issue 706.

<https://vegcropshotline.org/article/tomato-bacterial-diseases-bacterial-canker/>

**Alternating Fungicides to Avoid Fungicide Resistance.**

Issue 721.

<https://vegcropshotline.org/article/alternating-fungicides-to-avoid-fungicide-resistance/>

**Dry Weather and Fungicide Applications.** Issue 721.

<https://vegcropshotline.org/article/dry-weather-and-fungicide-applications/>

## Website Links

Frequently, we include links to websites or publications available online. If you can't access these resources, don't hesitate to contact your local Extension office or us to request a hard copy of the information.

## Midwest Vegetable Production Guide

This annually revised guide is a summary of currently suggested fertility, cultural, and pest management techniques and tools for commercial vegetable growers and is a collaboration of land-grant universities from eight states. It provides vegetable production information that is valid for the current year in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, and Ohio. The audience for the Midwest Vegetable Production Guide is commercial growers.

The searchable [online guide](#) is available at [mwveguide.org](http://mwveguide.org). There is no charge for accessing the guide, and any updates will be available immediately. Therefore, access the online guide to get the most up-to-date version of the Midwest Vegetable Production Guide [mwveguide.org/guide](http://mwveguide.org/guide). You can also download a free copy of the guide from your computer or purchase a hard copy for \$12 from Stephen Meyers, [slmeyers@purdue.edu](mailto:slmeyers@purdue.edu).

Do not hesitate to contact me at [plangenh@purdue.edu](mailto:plangenh@purdue.edu) if you have any questions or suggestions for improving the newsletter. Let me know if there are specific topics you would like to see more of in the newsletter. Also, let us know if things are not working for you. We want to improve the newsletter, and your input is valuable.

We hope you enjoy the newsletter. Happy reading!

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## Insect Spotlight: Blow Flies

(Robert Grosdidier, [rgrosdid@purdue.edu](mailto:rgrosdid@purdue.edu)) & (Laura Ingwell, [lingwell@purdue.edu](mailto:lingwell@purdue.edu), (765) 494-6167)

Blow flies are a group of iridescent green or blue flies belonging to the family Calliphoridae. Flies undergo complete metamorphosis, transitioning through egg-larva(maggot)-pupa-adult. Often in this situation, the larvae and adults occur in different environments and feed on different food sources. In fact, blow fly larvae are carrion feeders, meaning they feed on the decaying flesh of dead animals. Because of this, blow flies are important decomposers in nature and can also provide useful information to forensic entomologists. Adult blow flies often seek nectar resources from flowers and, subsequently, can act as

pollinators. Therefore, blow flies can positively impact the yield of flowering crops!

The presence of blow fly adults has been linked to increased fruit set and quality for small fruit crops like blueberries and strawberries. They have also been shown to be efficient pollinators for carrots and leeks for seed production purposes. Because flies, in general, are active across a wider range of climatic conditions (e.g., temperature, precipitation, altitude, etc.) compared to bees, they make ideal pollinators for crops grown in protected culture, including greenhouses and high tunnels. They can tolerate the high temperatures that occur in these structures. In fact, our team at Purdue sees many blow flies pollinating in the high tunnels we visit across the state of Indiana!

Blow flies get a bad rap for the unsavory conditions in which the larvae live and feed, but these insects contribute to pollination services in some of the more unfavorable environments for bees, and therefore, we are especially interested in understanding their contributions to pollination in high tunnels. If you happen to see some blow flies visiting your crops this growing season, let them be. They're working for you!



Figure 1. Blow fly visiting Brassica flowers in a high tunnel on an Indiana farm (Photo by Robert Grosdidier).

## Weed Spotlight: Common Milkweed

(Carlos Lopez, [clopezma@purdue.edu](mailto:clopezma@purdue.edu)) & (Stephen Meyers, [slmeyers@purdue.edu](mailto:slmeyers@purdue.edu), (765) 496-6540)

### Common names

Common milkweed, silkweed, cotton-weed, Virginia silk, wild cotton, silky milkweed, common silkweed, showy milkweed, swallow wort.

### Latin name

*Asclepias syriaca*.

- "*Asclepias*" from Asklepios, the Ancient Greek god of medicine and healing.
- "*syriaca*" is Latin for the country of Syria and was so named because Linnaeus mistakenly thought this plant came from Syria.

### Family

Apocynaceae – "the dogbane family". Previously, milkweeds were assigned to their own family, Asclepiadaceae.

### Life cycle

Common milkweed is a perennial plant that often forms large colonies through the growth of underground rhizomes. New plants can originate from seeds, and successful seedlings quickly establish a deep taproot system. During the first year of growth, the plant typically has a single stem, may not reach its full mature size, and often does not flower. However, in subsequent years, especially in favorable conditions, the plant can spread horizontally, and more stems will emerge from the rhizome network.

Interestingly, the stems of established common milkweed plants often emerge later in the spring compared to many other plant species. This delayed emergence may be a strategy to avoid frost damage or competition with earlier-growing plants.

### Identification

- **Seedlings** have smooth, light green stems and round cotyledons (seed leaves) 0.5 inches long. The first true leaves are dull green with prominent veins and pointed tips. The leaves appear in pairs across the stem from one another, referred to as an "opposite" leaf arrangement. Vegetative sprouts (Figure 1) are more common than seedlings and have folded leaves that unfold as the stem elongates.



Figure 1. Common milkweed sprouts emerging at the Purdue Student Farm, West Lafayette, IN (Photo by Carlos Lopez).

- **Mature plants** reach 3 to 5 feet tall on a single, hollow, unbranched, and hairy green stem that turns reddish with age. Leaves are opposite, 3 to 8 inches long, elliptical, and hairless on top but hairy underneath, with a prominent white midvein (Figure 2). Round flower clusters develop in the upper leaf axils in the summer months, followed by fruit. The fruit of a common milkweed is referred to as a "follicle" because it splits at only a single suture. Each follicle is 3 to 5 inches long, teardrop-shaped, bumpy, and spiny. Follicles often appear in pairs on the plant. Mature follicles split open, releasing hundreds of brown, oval seeds with a raised center and thin, papery edges. Each seed has a tuft of silky white hairs that facilitates seed dispersal by wind.



Figure 2. An established common milkweed plant 3 feet tall (left) and a view of leaves growing in an opposite leaf arrangement (right) at the Purdue Student Farm, West Lafayette, IN (Photo by Carlos Lopez).

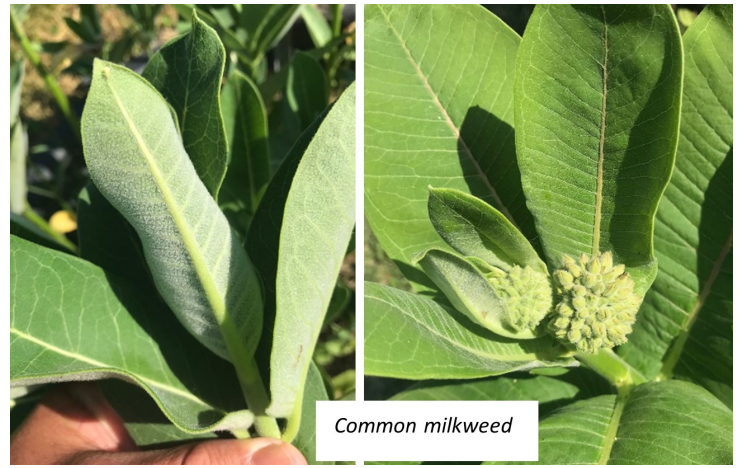


Figure 4b. Lower leaf surface and top common milkweed (below) plants (Photo by Carlos Lopez).



Figure 3. Developing flower buds (left) and a milky hollow stem (right) of common milkweed (Photo by Carlos Lopez).

- **How can I tell common milkweed from hemp dogbane?** Hemp dogbane leaves are almost hairless when they are young, but milkweed leaves have fine hairs. Hemp dogbane stems are typically reddish-purple and thinner than milkweed stems; milkweed usually does not branch, but hemp dogbane often does.

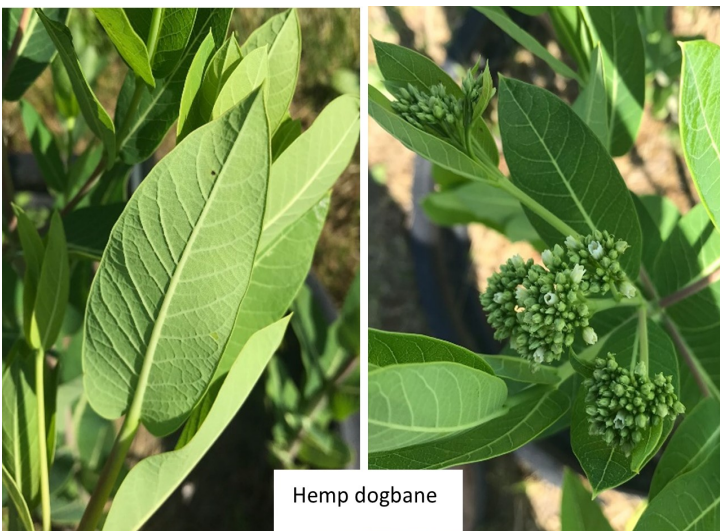


Figure 4a. Lower leaf surface and top of hemp dogbane plants (Photo by Carlos Lopez).

## Integrated weed management strategy

### Cultural and mechanical practices

- Tillage: Repeated shallow cultivation that cuts shoots before they can replenish the roots is required, as the shoots can emerge from roots well below the plow layer. A tilled fallow period from late spring through summer can help get heavy infestations under control, as carbohydrate storage in the roots reaches a minimum in July to September.
- Crop Rotation: Rotate with crops that establish a leaf canopy before common milkweed emergence to maintain a competitive canopy through the season and greatly suppress this weed.
- Ecological Considerations: Common milkweed hosts aphids that provide a food source for parasitic wasps, which can attack and control the European corn borer (*Ostrinia nubilalis*). Maintenance of low milkweed densities near crop fields may contribute to a balanced landscape management strategy that realizes the ecological benefits of common milkweed while avoiding its agricultural liabilities.

### Chemical Control Options

The use of herbicides should be carefully considered, taking into account factors such as the crop being grown, potential environmental impact, and the development of herbicide resistance.

- The post-emergence (POST) herbicides 2,4-D, dicamba, and glyphosate can be used to control common milkweed with variable success.

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## Clearspring Produce Auction Update

(Jeff Burbrink, [jburburink@purdue.edu](mailto:jburburink@purdue.edu))

The Clearspring Produce Auction is located just 2 miles south of US 20 in Clearspring Township in the Heart of the LaGrange-Elkhart Amish Settlement. It is within easy driving distance of the

towns of Shipshewana, Topeka, Emma, and LaGrange.

Produce is sold 3 days a week throughout most of the growing season (Tuesday, Thursday, Friday), with a hay sale on Saturdays. Office hours are Monday and Wednesday, 1 to 4 pm, and Tuesday, Thursday, and Friday, 8 am to 4 pm. An auction report can be heard by calling (260) 463-4131. Besides the produce and hay auctions, Clearspring has an equipment and supply business operating onsite for growers.

Are you curious about vegetable pricing?

In an effort to communicate more market information, we are publishing Clearspring Produce Auction volumes and prices. You will be able to view volumes and pricing below:

June 4, 2024

June 11, 2024

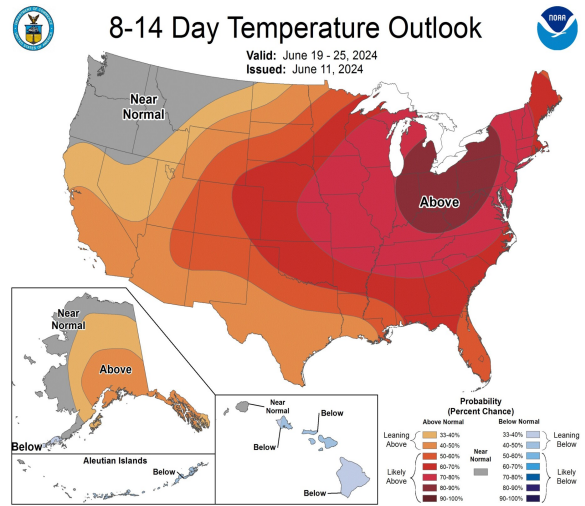


Figure 1. The National Weather Service's Climate Prediction Center's 8-14 day temperature outlook displays high confidence in above normal temperatures for the period June 19-25.

## Drying Out and Heating Up

(Jacob Dolinger, [jdolinge@purdue.edu](mailto:jdolinge@purdue.edu))

Meteorological spring (March-May) roared to a close on May 31, and the data is in—it was the 26<sup>th</sup> wettest on record in 130 years of records, with 14.28 inches of precipitation statewide, over 1.5 inches above normal. At the local level, Fort Wayne had its 4<sup>th</sup> wettest meteorological spring on record, with 15.93 inches of rain. South Bend had its 25<sup>th</sup> wettest on record with 12.10 inches of precipitation, and Indianapolis came in at 24<sup>th</sup> with 15.5 inches. Any drought conditions are long gone!

The wetter pattern has calmed down, though. The National Weather Service's Climate Prediction Center (NWS CPC) is predicting near normal precipitation for the entire Hoosier State through June 25, and equal chances for above or below normal precipitation through the beginning of July.

Even more noteworthy is the degree of confidence in above normal temperatures through much of the rest of June. Through at least June 25, the CPC has almost all of Indiana in an 80-90% chance of above normal temperatures (Figure 1). We're likely staring down many hot and humid days ahead for the rest of June, including heat index values potentially climbing above 100°F. NWS HeatRisk, a new experimental product used to forecast the risk of heat-related impacts, is already predicting moderate heat impacts for Indiana by June 16, and major heat impacts by June 17 (Figure 2). This means people should start making contingency plans for any long-duration outdoor activity in the coming days and weeks.

As temperatures have warmed, growing degree days have also accumulated rapidly, especially since May 1 (Figure 3). GDD accumulations have been above normal statewide for months now, and since just the beginning of May, accumulations have been above normal, most notably through central Indiana (Figure 4).

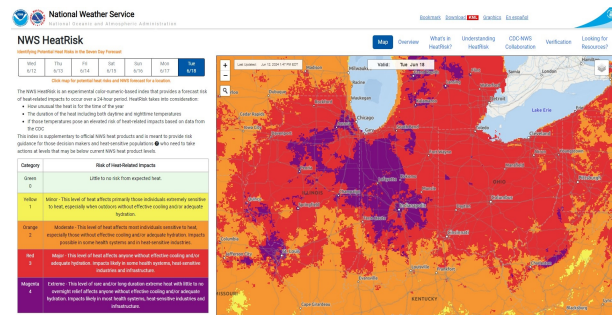


Figure 2. The National Weather Service's experimental HeatRisk product shows much of Indiana at risk of extreme heat on June 17. This means long-duration outdoor activity will negatively affect most people.

## Growing Degree Day (50 F / 86 F) Accumulation

May 1 - June 10, 2024

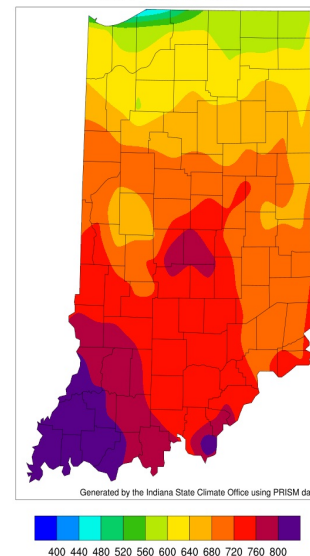


Figure 3. Growing Degree Day Accumulations for May 1-June 10.

## Growing Degree Day (50 F / 86 F) Departure From Average

May 1 - June 10, 2024

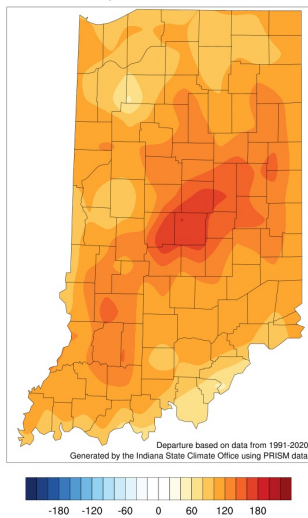


Figure 4. Growing Degree Day Departure from Average for May 1-June 10

## Do June-bearing Strawberries Harvest in June?

(Wenjing Guan, [guan40@purdue.edu](mailto:guan40@purdue.edu), (812) 886-0198)

This year, the strawberry season throughout Indiana seems to be early by about 10 days to 2 weeks, regardless of the production system. In southern Indiana, I heard the harvest lasted from mid/late April until mid-May in some fields. In central Indiana, the harvest started in mid-May and is nearing its end in early June. I was asked why the season started early, and here are my thoughts.

First, we experienced several hot days in April and May, with temperatures exceeding 80°F and even reaching 90°F on some days in southern Indiana. These high temperatures stimulate fruit ripening. Typically, it takes about 30 days from anthesis to harvest, but the process can be shortened to 25 days or less under such high temperatures.

The second reason for the early strawberry season could be the generally warm winter, especially the warm days in February, which might have caused the strawberries to wake up earlier in the spring.

In addition to weather conditions, planting strawberries on black plastic-covered beds and using floating row covers instead of straw for winter production also enhances early harvest.

Lastly, as far as I am aware, most fields did not experience major frost or freeze events that caused significant damage to strawberry blooms this year. As a result, most early blooms were able to set fruit, which may also contribute to the early harvest.

Will early strawberry harvests become a new trend? This will largely depend on the weather. In recent years, we've seen longer warm periods in the fall and milder winters, which could lead to more early blooming. However, whether these early blooms will result in an early harvest will depend significantly on whether we have frost/freeze events during the bloom period and

our ability to protect the flowers from these weather events.

## Irrigation Workshop for Small-Scale Vegetable Producers on Sept. 4

(Wenjing Guan, [guan40@purdue.edu](mailto:guan40@purdue.edu), (812) 886-0198)

**Date:** September 4, 2024

**Time:** 3:00 – 8:00 PM EST

**Location:** Southwest Purdue Ag Center, 4369 N Purdue Rd, Vincennes, IN

**Dinner Provided**

Join us for an informative workshop designed specifically for small-scale vegetable producers. This event will be held at the Southwest Purdue Ag Center in Vincennes, IN, on September 4th, 2024, from 3:00 to 8:00 PM EST. Dinner will be provided.

### Workshop Highlights:

- **Understanding Irrigation:** Learn the importance of proper irrigation management for vegetable production.
- **NRCS EQIP Programs:** Discover available programs and how to apply for them.
- **Expert Speakers:**
  - Cara Bergschneider, NRCS Urban Conservationist
  - Wenjing Guan, Purdue Extension Specialist
  - Scott Wagner, NRCS Agricultural Engineer

### Topics Covered:

- Plant Response to Water
- Irrigation Scheduling
- Automatic Irrigation Control
- Estimating Soil Moisture and Soil Moisture Sensors
- Irrigation Water Quality
- Water and Soil Health

The workshop includes both indoor presentations and field tours to demonstrate the concepts discussed.

### Registration:

This program is free but limited to 50 participants. If you are interested, please register through the [link](#). For questions about registration, contact Valerie Clingerman at [clingerman@purdue.edu](mailto:clingerman@purdue.edu) or (812) 882-3509. For sponsorship inquiries, contact Barb Joyner at [joynerb@purdue.edu](mailto:joynerb@purdue.edu) or (812) 886-0198.

### Partnership and Funding:

This event is a partnership between Purdue Extension, NRCS, and the Indiana Urban Soil Health Program. Funding is provided by the Indiana State Department of Agriculture through grant number A337-22-SCBG-21-003. The contents are solely the responsibility of the authors and do not necessarily represent the official views of the ISDA.

# Purdue Fruit and Vegetable Field Day on July 18, 2024

(Petrus Langenhoven, [plangenh@purdue.edu](mailto:plangenh@purdue.edu), (765) 496-7955)

We are happy to announce that Purdue Extension is presenting its annual Fruit and Vegetable Field Day on July 18, 2024, at the Throckmorton/Meigs Horticulture Farm, Lafayette, IN.

**Registration is now open! Register here: [Purdue Fruit and Vegetable Field Day](#)**

The program is now available. Download [HERE](#).

[Fruit and Veg Field Day 2024\\_Agenda FINAL\\_page1](#)

[Fruit and Veg Field Day 2024\\_Agenda FINAL\\_page2](#)

Contact [Lori Jolly-Brown](#) or [Petrus Langenhoven](#) if you have any questions.



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Editor: Petrus Langenhoven | Department of Horticulture and Landscape Architecture, 625 Agriculture Mall Dr., West Lafayette, IN 47907 | (765) 496-7955



**Market Report for**  
 Clearspring Produce Auction  
 2050 S 300 W  
 LaGrange, IN 46761  
 \* Phone (260) 463-4131  
 \* Fax (260) 463-4362  
 \* Market Report (260) 463-4131

Order Buyers:  
 David Schrock & Richard Yoder

Date of Report:	4-Jun	2024
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Description of Product	Unit	Units Sold	Price	
			Average	High
Beans, Green	lb	6	\$ 3.75	\$ 3.75
Beets, Red	qt	3	\$ 1.00	\$ 1.00
Bok Choy	bunch	30	\$ 1.00	\$ 1.00
Carrots	bunch	96	\$ 3.15	\$ 3.75
Cherries, Sweet	qt	16	\$ 5.00	\$ 5.00
Cucumber	1/2 bu	3	\$ 27.00	
Cucumber	peck	5	\$ 24.00	
Flower Flats		15	\$ 2.00	\$ 2.00
Flowers, 4 inch pots		1078	\$ 0.19	\$ 0.55
Flowers, 6-8 inch pots		315	\$ 1.69	\$ 6.00
Garlic	head	100	\$ 0.90	\$ 0.90
Hanging Baskets, 10 inch		588	\$ 4.57	\$ 8.00
Hanging Baskets, 12 inch		82	\$ 10.41	\$ 30.00
Herbs	various	246	\$ 1.64	\$ 6.00
Kolrabi	ct	414	\$ 1.29	\$ 1.50
Lettuce	head	608	\$ 0.66	\$ 1.75
Onions	ct	611	\$ 1.65	\$ 1.85
Peas	peck	5	\$ 19.00	\$ 19.00
Perennials	pots	142	\$ 4.47	\$ 13.00
Potato, Red	5#	1	\$ 4.50	\$ 4.50
Radishes	bunch	120	\$ 1.33	\$ 1.50
Raspberry starts		10	\$ 2.00	\$ 2.00
Rhubarb	lb.	368	\$ 1.18	\$ 2.00
Strawberries	qt	1355	\$ 4.02	\$ 5.25
Strawberry pots, 4 inch		14	\$ 3.25	\$ 3.25
Succulents	various	83	\$ 0.73	\$ 3.00
Tomato, Red	peck	23	\$ 15.70	\$ 20.00
Tomato, Yellow	peck	4	\$ 24.00	
Tomato, Yellow	10#	5	\$ 29.80	\$ 37.00
Tomatoes, Canner	1/2 bushel	33	\$ 17.55	\$ 19.00
Tomatoes, Cherry/Grape	pt	24	\$ 4.00	\$ 4.00
Tomatoes, Red	10#	241	\$ 20.93	\$ 26.00
Urns/Specialty Baskets		14	\$ 10.29	\$ 14.00
Vegetable Flats		2	\$ 3.00	\$ 3.00







**Market Report for**

Clearspring Produce Auction

2050 S 300 W

LaGrange, IN 46761

\* Phone (260) 463-4131

\* Fax (260) 463-4362

\* Market Report (260) 463-4131

Order Buyers:

David Schrock & Richard Yoder

Date of Report:	11-Jun	2024
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Description of Product	Unit	Units Sold	Price	
			Average	High
Beans, Green	lb	23	\$ 3.84	\$ 4.00
Bok Choy	bunch	24	\$ 1.25	\$ 1.75
Broccoli	head	125	\$ 3.75	\$ 3.75
Carrots	bunch	319	\$ 2.87	\$ 3.00
Cauliflower	head	444	\$ 4.48	\$ 5.00
Cucumber	1/2 bu	3	\$ 27.00	\$ 27.00
Cucumber	peck	47	\$ 19.81	\$ 23.00
Flowers, 6-8 inch pots		176	\$ 0.96	\$ 5.00
Garlic	head	120	\$ 1.10	\$ 1.10
Hanging Baskets, 10 inch		157	\$ 5.49	\$ 7.00
Hanging Baskets, 12 inch		85	\$ 6.21	\$ 10.00
Herbs	various	257	\$ 1.46	\$ 5.00
Kolrabi	ct	459	\$ 0.91	\$ 1.00
Lettuce	head	500	\$ 0.71	\$ 1.00
Onions	ct	923	\$ 1.09	\$ 2.00
Onions, green	bunch	20	\$ 1.75	\$ 1.75
Peas	peck	10	\$ 22.80	\$ 26.00
Perennials	pots	40	\$ 9.88	\$ 19.00
Potato, Red	5#	93	\$ 5.67	\$ 7.00
Radishes	bunch	12	\$ 1.50	\$ 1.50

Raspberry starts			10	\$ 5.00	\$ 5.00
Rhubarb		lb.	44	\$ 2.18	\$ 3.00
Strawberries		qt	622	\$ 4.81	\$ 5.50
Succulents		various	131	\$ 0.48	\$ 6.00
Tomato, Green		peck	5	\$ 24.00	\$ 27.00
Tomato, heirloom		10#	3	\$ 27.00	\$ 27.00
Tomato, Red		peck	25	\$ 16.67	\$ 20.00
Tomato, Yellow		peck	6	\$ 19.00	\$ 30.00
Tomato, Yellow		10#	10	\$ 30.00	\$ 30.00
Tomatoes, Canner		1/2 bushel	42	\$ 18.33	\$ 23.00
Tomatoes, Cherry/Grape		pt	39	\$ 3.10	\$ 3.25
Tomatoes, Red		10#	350	\$ 22.04	\$ 27.00
Urns/Specialty Baskets			11	\$ 13.45	\$ 22.00
Vegetable Flats			28	\$ 2.71	\$ 5.00
Zucchini		1/2 bu	15	\$ 10.47	\$ 12.00
Zucchini		peck	33	\$ 15.00	\$ 16.00
Zucchini, Yellow		peck	2	\$ 28.00	\$ 28.00

# Purdue Fruit and Vegetable Field Day

THURSDAY, JULY 18, 2024

Purdue Meigs Ag Center  
9101 S 100 E, Lafayette, IN 47909



Extension



## SCHEDULE

Registration: 8:00 – 9:00 am

Field Demonstrations:  
9:00 am – 12:30 pm

Lunch: 12:30 – 1:30 pm

## QUESTIONS? CONTACT

Petrus Langenhoven:  
(765) 496-7955  
[plangenh@purdue.edu](mailto:plangenh@purdue.edu)

Lori Jolly-Brown:  
(765) 494-1296  
[ljollybr@purdue.edu](mailto:ljollybr@purdue.edu)

## REGISTRATION

<https://am.ticketmaster.com/purdue/fvfield>

or scan QR code



## Purdue Fruit & Vegetable Field Day 2024

Coordinator: Petrus Langenhoven

Extension Staff: Lori Jolly-Brown, Jay Young, and Chloe Richard

## FIELD DEMONSTRATIONS / *Demo descriptions on page 2*

- Trap Crop System for Multi-generational Control of Flea Beetles in High Tunnel Brassica Crops
- Pollinators in High Tunnels vs. Open Field Production
- Evaluating the Impacts of Insect-Derived Soil Amendments on Crop Production
- Impact of Soil Fertility Amendments and Cover Cropping on Soil Health and Pepper Production
- A Comparison of Silage Tarping and Herbicides for Weed Control in Potato
- Evaluating the Use of Lasers as a Bird Control Strategy in the Vineyard
- Exploring the Use of Herbicide-Impregnated Fertilizer for Improved Crop Tolerance in Pumpkin
- Modern Apple Orchard Systems for Commercial and Backyard Growers

## SPONSORS



## FIELD DEMONSTRATION DESCRIPTIONS



Milena Agila



Wil Brown-Grimm



Josue Cerritos



Robert Grosdidier



Peter Hirst



Laura Ingwell



Ian Kaplan



Petrus Langenhoven



Steve Meyers



Helen Nocito



Miranda Purcell



Chloe Richard



Nathan Shoaf



Carla Wagner



Julie Wooby

### Trap Crop System for Multi-generational Control of Flea Beetles in High Tunnel Brassica Crops

*Julia Wooby, Ian Kaplan, and Laura Ingwell*

Management of flea beetles is made difficult by the high mobility of the adult life stage and overwintering habits, with few viable options for growers who use organic or low-input practices. Planting of a highly attractive trap crop can minimize pest populations on the cash crop, but multivoltine flea beetle species overwhelm cropping systems with the emergence of multiple generations of adult beetles which cause characteristic shotgun foliar damage. This stop will discuss combining a traditional trap cropping system with application of entomopathogenic nematodes (EPNs) to target soil-dwelling flea beetle larvae, reducing subsequent generations of the pest through biological control. *Crops: Collard Greens & Mustard trap crop*

### Pollinators in High Tunnels vs. Open Field Production

*Robert Grosdidier and Laura Ingwell*

The community composition and ecology of insect pollinators that visit crops in high tunnel growing systems is poorly understood. Understanding which pollinators visit crops in high tunnels can provide insights into which pollinators have the greatest impact on fruit set. This stop will discuss which pollinators are commonly found in high tunnels compared to field-grown crops, and how these patterns change in monoculture vs polyculture production. *Crops: Tomatoes, Long Beans, Zucchini, Strawberries*

### Evaluating the Impacts of Insect-Derived Soil Amendments on Crop Production

*Milena Agila and Laura Ingwell*

As the industry around insect-derived protein production grows, a new resource for soil amendments has become available – insect frass fertilizers. This includes cricket frass, black soldier fly compost and pupal casings. This stop will discuss the impact of three insect-derived soil amendments on two crops: bok choy and carrots. *Crops: Bok Choy, Carrots*

### Impact of Soil Fertility Amendments and Cover Cropping on Soil Health and Pepper Production

*Petrus Langenhoven and Nathan Shoaf*

What is the impact of soil management practices on soil health? Does increasing soil health mean reduced input, and does pepper variety performance differ according to soil health status? During this presentation, we will discuss the progress and results of an ongoing 4-year USDA-funded grant, Soil to Market, that was designed to help answer some of these questions. *Crop: Peppers*

### A Comparison of Silage Tarping and Herbicides for Weed Control in Potato

*Josue Cerritos and Stephen Meyers*

While much research has centered on weed management in large-scale agriculture, small farms play a crucial role in local food systems. Innovative tools like silage tarps offer valuable solutions. These reusable plastics or fabrics help create a stale seedbed or facilitate the emergence of slow-germinating crops such as potatoes. This year a field study is being performed to compare the use of silage tarping and herbicides for weed management in potato production. Join us for a field demonstration on silage tarps for early-season weed management and explore how integrating tarping into small-scale systems enhances weed control. We'll also be comparing tarping with traditional herbicide use, offering insights into sustainable weed management. *Crop: Potatoes*

### Evaluating the Use of Lasers as a Bird Control Strategy in the Vineyard

*Miranda Purcell and Carla Wagner*

Bird control is one of the largest issues that grape growers in Indiana deal with. At this point, it seems the best strategy is to use a combination of deterrents, and lasers are one of the up-and-coming strategies that are showing a lot of promise. In this trial, we are evaluating the effectiveness of lasers vs. bird netting on total grapevine yield, % damage to fruit and frequency of birds in the treatment area. *Crop: Grapes*

### Exploring the Use of Herbicide-Impregnated Fertilizer for Improved Crop Tolerance in Pumpkin

*Helen Nocito and Stephen Meyers*

We'll talk about methods and results from an IR-4 funded trial exploring improved crop tolerance through herbicide-impregnated AMS and compare it to traditional broadcast applications. *Crop: Pumpkins*

### Modern Apple Orchard Systems for Commercial and Backyard Growers

*Peter Hirst*

Modern apple orchards, whether a few trees or thousands of trees depend on dwarfing rootstocks. These rootstocks not only keep the trees smaller and easier to reach, but also produce more fruit and higher quality fruit. But when the rootstocks is changed, many other aspects of orchard management also need to be changed. This includes factors such as planting distance, tree staking or support, and pruning style. We will discuss all aspects of management of trees of dwarfing rootstocks. *Crop: Apples*

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