In This Issue

From the Editor's Desk

(Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955)

Dear Valued VCH Readers,

Welcome to this week's edition of the Vegetable Crops Hotline!

As we move deeper into the growing season, this week's edition brings you essential insights and timely updates to help navigate the opportunities and challenges ahead. From understanding how vegetable growers are integrating sustainable practices through our latest producer survey findings to exploring practical solutions for pest management and soil health, we've compiled resources that speak directly to the diverse needs of Indiana's agricultural community.

This issue highlights the power of learning from one another, featuring upcoming educational opportunities including Purdue's Small Farm Education Field Day in July, the new Cut Flower Tour series launching statewide, and registration reminders for specialized field days focusing on mechanical weed control and fruit and vegetable production. We also want to emphasize the final call for registration at the Southwest Purdue Agricultural Center (SWPAC) Field Day, located in Indiana's premier watermelon-growing region, where specialty crops meet cutting-edge agricultural innovation—an event that showcases how research and Extension priorities are evolving to meet modern agriculture's changing demands. We also address current environmental conditions affecting your operations, from the hazy skies caused by Saharan dust storms and Canadian wildfire smoke to the early arrival of hurricane season and its potential impact on regional weather patterns.

For those dealing with immediate field challenges, you'll find targeted guidance on beneficial insects like soldier beetles that can help control cabbage aphids, summer cover crop strategies to improve soil health and manage weeds, and our insect spotlight on cabbage loopers to help you identify and address this migrating pest. Whether you're a small-scale grower exploring cut flower production or managing large vegetable operations, this week's content offers practical, research-backed information to support your success throughout the season.

Growers and Purdue Extension Educators

Your input and expertise make this newsletter a truly useful resource. If you have hot topics you'd like us to cover, success stories to share, or questions for our Extension specialists, please get in touch with us at plangenh@purdue.edu or contact the specialist directly. We also welcome high-quality photos of pest issues, unusual symptoms, or innovative production practices you've implemented on your farm.

Website Links in Newsletter Articles

We frequently include links to websites or online publications. If you are unable to access these resources, please don't hesitate to contact your local Purdue Extension office or us to request a hard copy of the information.

Midwest Vegetable Production Guide

The 2025 Midwest Vegetable Production guide is now available for growers to visit online at **mwveguide.org**, or you can download and print a guide from your computer at **mwveguide.org/guide**. The guide can also be purchased for $15 per copy. Contact your Extension Office or Stephen Meyers (slmeyeres@purdue.edu) directly to buy a copy.

Midwest Vegetable Trial Reports

Are you still considering purchasing vegetable seeds? The Midwest Vegetable Trial Reports feature many articles to help you

make an informed decision. The resource also hosts research results related to production.

Best regards,

Petrus Langenhoven
Clinical Assistant Professor and Vegetable Extension Specialist
Department of Horticulture and Landscape Architecture
Purdue University

Don’t Miss Out: Final Call for SWPAC Field Day Registration!

(Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955)

Time is running short—register TODAY to secure your spot at this year’s Southwest Purdue Agricultural Center Field Day!

Located in the heart of Indiana’s premier watermelon-growing region, the Southwest Purdue Agricultural Center (SWPAC) stands as one of Purdue’s eight agricultural research centers, uniquely positioned where specialty crops meet cutting-edge agricultural innovation. This field day represents your chance to witness firsthand how research and Extension priorities are evolving to meet the changing demands of modern agriculture.

Why This Field Day Matters Now More Than Ever

Southern Indiana’s agricultural landscape continues to diversify beyond its famous watermelon and cantaloupe production. With fruit and vegetable operations expanding alongside traditional agronomic crops, the research happening at SWPAC directly impacts the future of farming across our region. This field day offers an unparalleled opportunity to see these advances in action—but only if you register immediately.

What Awaits You

Tour active research plots and attend presentations covering the most pressing agricultural topics of 2025:

Crop Diversification & Market Opportunities

- Winter canola production and emerging market potential
- Sorghum as a viable alternative crop across Indiana
- The Diverse Corn Belt project and its implications

Innovation in Production Practices

- Drone technology for pesticide application
- High tunnel tomato production techniques
- Enhancing seed quality traits in cowpeas

Sustainability & Resilience

- Pollinator health and strategic pollenizer use in watermelon production
- Purdue’s resilient agriculture initiative and implementation strategies
- Cut flower research for diversified farm income

Disease Management & Food Safety

- Latest synthetic and biological fungicide evaluations for watermelon and tomato
- Current field crop disease updates
- New food safety regulation changes and related research projects

Special Feature Presentation

Don’t miss Dr. Fred Whitford’s captivating presentation, “*Horsepower on the Farm: From Hay-Powered Horses to Gas-Powered Tractors*“—a fascinating journey through agriculture’s mechanical evolution that connects our past to our future.

Register NOW—Before It’s Too Late

The SWPAC Field Day is completely FREE, and lunch is provided courtesy of our generous sponsors. However, space is limited, and registration is filling fast.

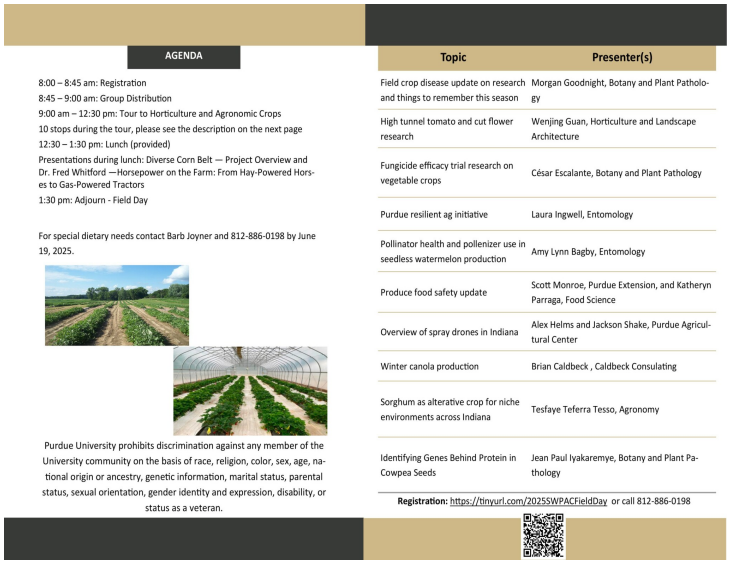
To avoid disappointment, you must register TODAY:

- Online: https://tinyurl.com/2025SWPACFieldDay
- Phone: 812-886-0198

Whether you’re a grower, researcher, Extension professional, or anyone passionate about agriculture’s future, this field day will provide insights you can’t afford to miss. The innovations showcased here today will shape farming practices tomorrow.

Don’t wait—register now and be part of agricultural progress in action!

For complete event details, refer to the official flyer or contact SWPAC directly.



AGENDA

8:00 – 8:45 am: Registration
8:45 – 9:00 am: Group Distribution
9:00 am – 12:30 pm: Tour to Horticulture and Agronomic Crops
10 stops during the tour, please see the description on the next page
12:30 – 1:30 pm: Lunch (provided)
Presentations during lunch: Diverse Corn Belt — Project Overview and Dr. Fred Whitford —Horsepower on the Farm: From Hay-Powered Horses to Gas-Powered Tractors
1:30 pm: Adjourn - Field Day

For special dietary needs contact Barb Joyner and 812-886-0198 by June 19, 2025.

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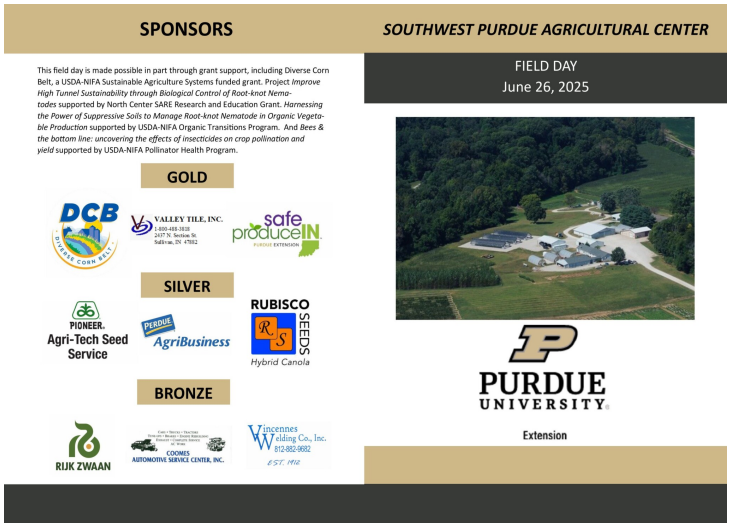
Topic	Presenter(s)
Field crop disease update on research and things to remember this season	Morgan Goodnight, Botany and Plant Pathology
High tunnel tomato and cut flower research	Wenjing Guan, Horticulture and Landscape Architecture
Fungicide efficacy trial research on vegetable crops	César Escalante, Botany and Plant Pathology
Purdue resilient ag initiative	Laura Ingwell, Entomology
Pollinator health and pollenizer use in seedless watermelon production	Amy Lynn Bagby, Entomology
Produce food safety update	Scott Monroe, Purdue Extension, and Katheryn Parraga, Food Science
Overview of spray drones in Indiana	Alex Helms and Jackson Shake, Purdue Agricultural Center
Winter canola production	Brian Caldbeck , Caldbeck Consulating
Sorghum as alterative crop for niche environments across Indiana	Tesfaye Teferra Tesso, Agronomy
Identifying Genes Behind Protein in Cowpea Seeds	Jean Paul Iyakaremye, Botany and Plant Pathology

Registration: https://tinyurl.com/2025SWPACFieldDay or call 812-886-0198



Understanding Farm Decision-Making: Insights from the 2024-2025 Producer Survey

(Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955), (Maria Marshall, mimarsha@purdue.edu), (Nathan Shoaf, nlshoaf@purdue.edu) & *(Renee Wiatt, reneewiatt@purdue.edu)*


Small and medium-sized vegetable farms face unique challenges balancing profitability with sustainable production practices and food safety requirements. To better understand how these farmers navigate complex decision-making processes, the Soil to Market Team—comprising Maria Marshall, Renee Wiatt, Petrus Langenhoven, Betty Feng, and Nathan Shoaf—conducted a comprehensive survey of 500 small and medium-sized farmers across the United States during 2024-2025. This research, funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture, focuses on holistic farmer decision-making processes.

This article series will present key findings from the survey, offering insights that can help both growers and Extension educators better understand the interconnected nature of farm planning. These findings aim to support more profitable and sustainable vegetable farming operations by examining the relationship between strategic planning and farm performance.

From Soil to Market: How Vegetable Growers Are Integrating Sustainable Practices

Recent survey data from nearly 500 vegetable growers reveals a compelling picture of how growers are making integrated decisions that span from soil health to market demands. The findings highlight a strategic shift toward practices that balance productivity, sustainability, and economic viability in the soil-to-market continuum.

Fertilizer Strategies: Balancing Traditional and Organic Approaches

The survey data shows that vegetable growers employ a diverse fertilizer strategy influenced by careful decision-making across the production cycle (Figure 1). Inorganic fertilizers remain the most frequently used input, with 58% of growers using them frequently. This high adoption rate suggests that conventional fertilizers continue to play a crucial role in meeting immediate crop nutrient needs and market timing requirements.

However, the widespread adoption of compost tells a different story about long-term soil management. Over 90% of growers use compost to some degree, with 54% using it frequently. This represents a significant commitment to soil health that extends beyond single-season production goals. The fact that 47% of growers make their own compost indicates a deep integration of soil building into their overall operation planning (Figure 2).

Animal manure and byproducts show moderate adoption patterns, with most growers using them rarely or seldom. This measured approach likely reflects logistical considerations, regulatory requirements, and the need to coordinate these inputs with market timing and food safety protocols.

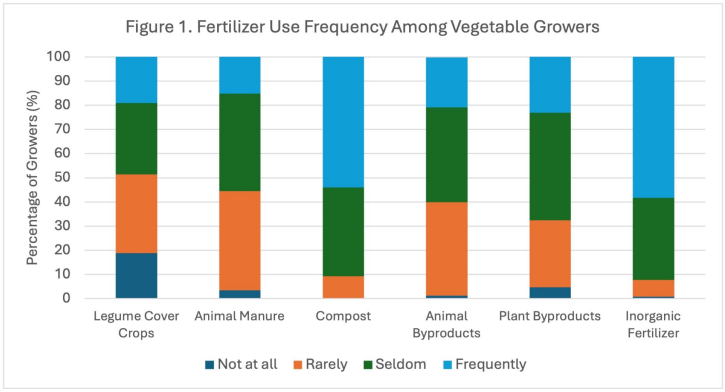


Figure 1. Fertilizer Use Frequency Among Vegetable Growers.

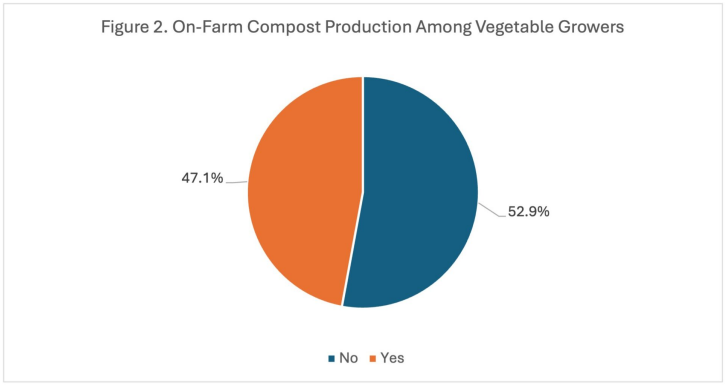


Figure 2. On-Farm Compost Production Among Vegetable Growers.

Conservation Practices: Building Soil Capital for Market Success

The adoption of conservation practices reveals how growers are thinking systematically about soil-to-market connections (Figure 3). Crop rotation shows remarkable adoption, with 89% of growers using it to a moderate degree or more. This practice exemplifies integrated decision-making, as rotation decisions must account

for soil health, pest management, market demand cycles, and labor scheduling.

Conservation tillage practices are used by 76% of growers to some extent, indicating that they recognize that soil structure preservation supports both environmental goals and consistent crop quality. Strip cropping, used by nearly all growers surveyed, demonstrates how growers are managing field-level variability to optimize both soil protection and harvest efficiency.

The data reveals an important distinction in how growers approach cover crops. When asked specifically about legume cover crops as a fertilizer input, as shown in Figure 1, only 19% of growers use them frequently. These are nitrogen-fixing species like sunn hemp, crimson clover, hairy vetch, and winter peas grown primarily for their fertilizer value. However, when asked about cover crops as a conservation practice more broadly (Figure 3), 81% of growers use them to some degree. This significant difference (19% vs 81%) indicates that growers are selecting from a diverse toolkit of cover crop species to meet multiple objectives simultaneously. Rather than focusing solely on nitrogen fixation, growers are choosing cover crops for soil protection, weed suppression, organic matter building, and compatibility with their planting schedules. This broader approach reflects integrated thinking that considers cover crops as multi-functional tools in the soil-to-market system rather than simple fertilizer replacements.

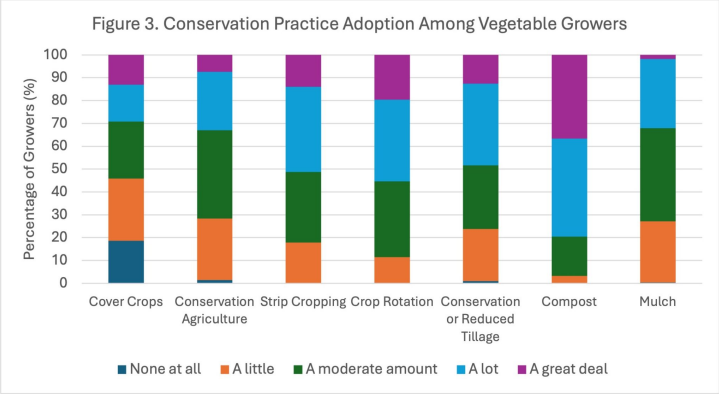


Figure 3. Conservation Practice Adoption Among Vegetable Growers.

Production Systems: Meeting Market Demands Through Diverse Approaches

The production system data reveals strategic market positioning, with 63% of production remaining conventional while 37% involves some form of organic practices (Figure 4). The 18.5% certified organic segment represents growers who have made comprehensive soil-to-market commitments, often commanding price premiums that justify the intensive management required.

The 10% using organic practices without certification suggests growers who are integrating sustainable soil management for reasons beyond market premiums—possibly focusing on soil health, certification cost savings, or preparing for future market opportunities. The 8% transitioning to organic represents active investment in soil building and market repositioning.

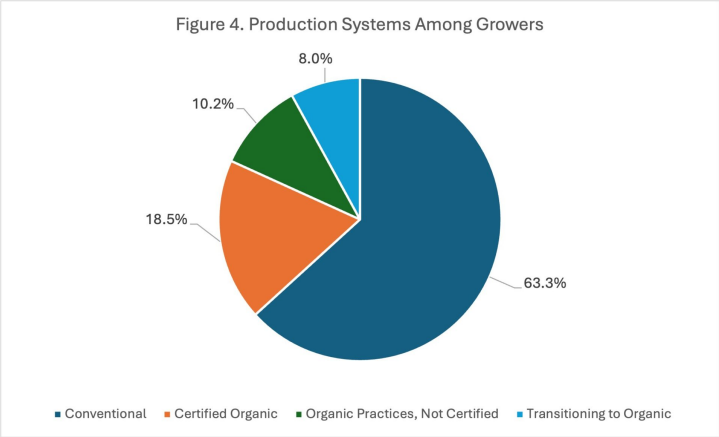


Figure 4. Production Systems Among Growers.

Integrated Decision-Making in Practice

These survey results demonstrate that successful vegetable growers are making decisions that integrate soil health, production efficiency, and market requirements. The high adoption of compost and crop rotation alongside continued reliance on inorganic fertilizers suggests that growers are building soil health capital while maintaining production reliability.

The prevalence of conservation practices across production systems indicates that building soil health has become integral to business planning rather than an add-on consideration. Growers appear to recognize that healthy soils support consistent quality, reduce input costs over time, and provide resilience against weather variability, which are all factors that affect market success.

Implications for Extension and Advisory Services

These findings suggest that vegetable growers are ready for technical information that addresses integrated systems rather than single practices. Extension programming that connects soil health practices to harvest timing, post-harvest quality, and market positioning will likely resonate with producer decision-making processes.

The high rate of on-farm compost production indicates strong interest in closed-loop nutrient management, suggesting opportunities for technical assistance in compost quality, timing, and integration with other fertility inputs.

As the vegetable industry continues evolving toward more integrated production systems, the soil-to-market perspective will become increasingly important for maintaining both environmental sustainability and economic viability in vegetable production.

Funding Acknowledgement

This work is supported by the Agriculture Food Research Initiative-Small and Medium Sized Farms Program, project award no. 2021-68006-33893, from the U.S. Department of Agriculture's National Institute of Food and Agriculture.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s)

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Insect Spotlight: Cabbage Looper

(Milena Agila, magilaen@purdue.edu) & *(Laura Ingwell, lingwell@purdue.edu, (765) 494-6167)*

Trichoplusia ni, commonly known as the cabbage looper, is a moth in the family Noctuidae. Native to North America, it is a polyphagous pest (feeds on lots of different plants) that can cause significant damage in a variety of crops and potentially lead to plant death. While cabbage looper has a large geographical distribution, it does not overwinter in the Midwest. However, they migrate into the region from warmer southern areas from early spring through late fall. While the cabbage looper feeds on a wide range of plant species, it is most associated with cruciferous vegetables, including broccoli, cabbage, cauliflower, radish, turnip, and bok choy. Other host plants can include alfalfa, cotton, soybeans, tomato, and pepper, although less frequently.

Figure 1. Eggs of the cabbage looper. (Photo by John L. Obermeyer).

Figure 2. Early instar larvae of cabbage looper (Photo by John L. Obermeyer).

The cabbage looper has multiple generations per year, depending on weather conditions. Its life cycle consists of four stages (complete metamorphosis): egg, larva, pupa, and adult. A female can lay up to 350 eggs—the eggs, which are green, pale, and oval, hatch after three to six days (Figure 1). Then, the larvae, which are light green with a white stripe on each side, undergo five instars in 15 to 20 days, depending on the temperature (Figure 2). The distinct looping movement of cabbage looper larvae sets them apart from the majority of other caterpillars found in brassica crops. They move by bringing their back end forward to meet the front legs and arching a section of their body (Figure 3). This is the life stage that is most destructive to the crop, chewing large holes and they consume plant tissue and progress through their larval instars (Figure 4). The larger they get, the more they eat! The pupa is found in a thin cocoon, often on the plant tissue, and takes around 14 days to turn into an adult (Figure 5). The cabbage looper adult is a mottled, gray-brown moth, a nocturnal flyer that lays eggs during the night and spends most of the day resting on its host plants (Figure 6). Its body is about 1 inch (2.5 cm) long with a wingspan of 1.5 inches (3.8 cm).

Figure 3. The characteristic loop shape for which it is named. This is a result of the way their body attaches to the plant as they move along the leaf (Photo by John L. Obermeyer).

Figure 4. Damage caused by cabbage looper larvae (Photos by John L. Obermeyer).

Figure 5. Cabbage looper pupa (Photo by John L. Obermeyer).

Figure 6. Cabbage looper adult. (Photo by John L. Obermeyer).

The management of cabbage loopers can be achieved by monitoring pheromone traps to detect the emergence (or immigration) of adults and conducting regular scouting to look for eggs and small larvae on the underside of leaves on host plants. There are two beneficial insects that aid in managing this voracious pest: a parasitic wasp (e.g., *Trichogramma pretiosum*) and a tachinid fly (e.g., *Voria ruralis*). Including insectary plants, such as sweet alyssum, can help attract natural enemies that contribute to pest suppression. The biopesticides *Bacillus thuringiensis* and Spinosad offer good control but may need to be reapplied often. Other control measures can be found in the Midwest Vegetable Production Guide. These will also help manage the other Brassica caterpillars that are often found in conjunction with cabbage loopers. As with all chemical applications, it is important to follow the instructions provided on the product label – the label is the law.

Soldier Beetles: Summer Allies Against Cabbage Aphids

(Allison Zablah) & (Laura Ingwell, lingwell@purdue.edu, (765) 494-6167)

If you're scouting for cabbage aphids (Figure 1) in your brassicas this summer, don't overlook one of your garden's lesser-known allies: soldier beetles, also known as leatherwings (Figure 2). These beneficial insects can be valuable predators, especially when aphid populations begin to surge in warm weather. Cabbage aphids are difficult to manage due to their rapid reproduction and their ability to hide within curled leaves. For this reason, conserving natural enemies that can reduce aphid populations is important.

Figure 1. Cabbage aphids (Photo by John Obermeyer).

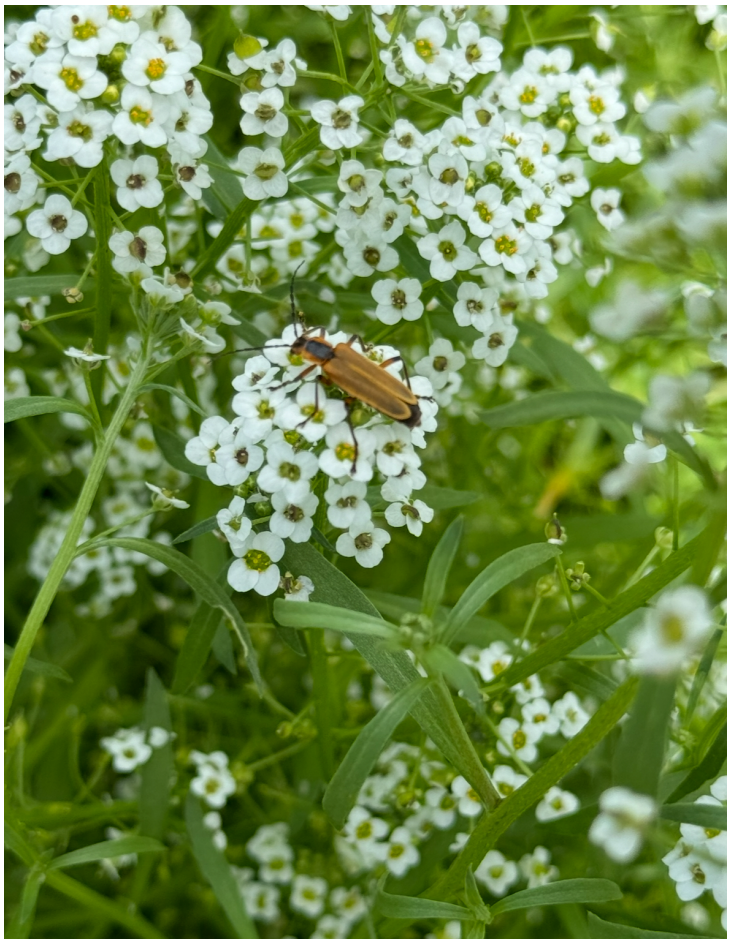

Figure 2. Soldier beetle adult (Photo by Allison Zablah).

Soldier beetles are most active during the summer and are commonly found visiting flowers. Adults feed on nectar and pollen, but they don't stop there! They also prey on a variety of soft-bodied insects, including cabbage aphids (*Brevicoryne*

brassicae) and even the eggs of some caterpillars. Both the adults and larvae are predatory, making this beetle a double threat to garden pests.

Last season, we observed soldier beetles in raised beds planted with kale and sweet alyssum. These beds had a steady floral presence, which likely helped sustain beetle populations. The adults were frequently spotted patrolling kale leaves and flower heads.

Soldier beetles undergo complete metamorphosis as they develop from egg to adult. Adult females typically lay their eggs in clusters in the soil or in organic litter/topsoil, often at the end of summer. After feeding as larvae (Figure 3) in the soil, they pupate underground and emerge as adults later in the season. These larvae are primarily carnivorous, feeding on a variety of insect eggs, larvae, and pupae of other arthropods found in the soil. They are known to prey on pests like grasshopper eggs, cucumber beetles, and corn rootworms. To support them, maintaining undisturbed soils and floral resources is key. Plants like sweet alyssum, cilantro, dill, and other small-flowered herbs can provide essential nectar sources to keep them around.

Figure 3. Soldier beetle larva (Photo by John Obermeyer).

Tips to Encourage Soldier Beetles in Your Garden or High Tunnel:

1. Plant companion flowers like sweet alyssum, cilantro, or dill around brassicas.
2. Avoid broad-spectrum insecticides, especially during flowering periods.
3. Keep soil healthy with living plant material for as many months of the year as possible and minimize disturbance (tillage or cultivation), giving larvae a safe place to develop.

Soldier beetles may not get the spotlight like lady beetles or lacewings, but they play an important role in the summer insect community. They are large, brightly colored, and sometimes mistaken for fireflies because of the coloration on their abdomen. This season, keep an eye out for these leather-winged predators; they just might be helping you more than you think.

It's a Hazy Shade of .... June

(Beth Hall, hall556@purdue.edu)

Welcome to the start of Hurricane Season, which runs from June through November each year. Why would Indiana care about hurricane season? Certainly, by the time any hurricane might impact the state, it will have been greatly downgraded to what is called an extratropical (i.e., poleward of the Tropic of Cancer (23.5° north latitude)) storm or the remnants of the hurricane. Regardless, these hurricane remnant storms can bring often-needed rainfall with enough moisture to potentially be drought busters.

While our first tropical storm of 2025 (would be named "Andrea") has yet to develop, forecasters are keeping an eye on strong wind patterns coming from western Africa and areas of low pressure that could strengthen to tropical storm levels (maximum sustained surface winds reaching 39-73 mph (34-63 knots)).

Speaking of those easterly winds coming from western Africa, another reason why Indiana may be interested in these and other tropical storm patterns is due to massive Saharan dust storms that can be carried thousands of miles across the Atlantic Ocean. There is currently a massive dust cloud, fed by the Sahara Desert and carried by the northeast trade winds, that is headed our way (Science Alert). AccuWeather provides a fun animation of the size and path of this dust storm that is currently impacting the Caribbean Sea and is projected to steer northward into the United States from the Gulf region (AccuWeather). Depending upon how far north this dust plume goes, we may see hazy skies that are likely to reduce the amount of solar radiation reaching our surface.

Smoke from Canadian wildfires is also creating hazy skies across Indiana. The National Oceanic and Atmospheric Administration (NOAA) provides an experimental smoke forecast product that predicts smoke intensity for the next 48 hours. The *New York Times* offered a color-shaded product of the NOAA tool, as shown in Figure 1. As long as the wildfires continue burning and upper-atmospheric winds continue to steer the smoke southeastward, we can expect hazy skies across our area.

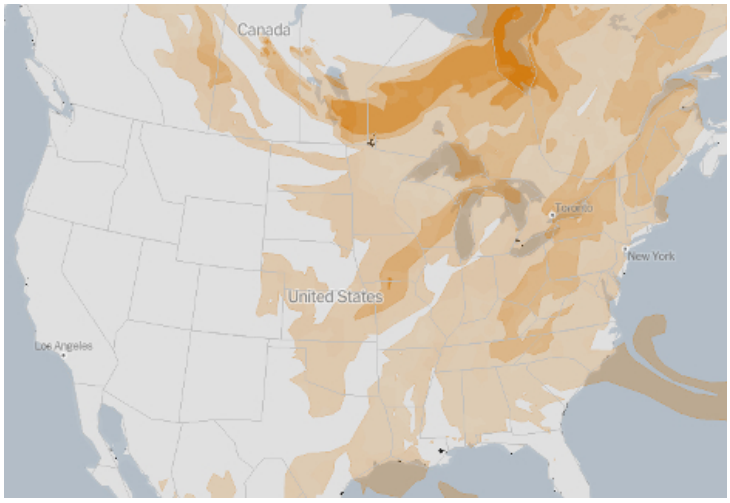

Figure 1. Example of the NOAA experimental forecast product showing smoke intensity for 3 PM EDT on Wednesday, June 4, 2025. Product enhanced by the New York Times.

How do hazy skies impact crop production? There are both positive and negative impacts. As mentioned, smoky skies can block incoming solar radiation, which is necessary for photosynthetic development. However, the reduced solar radiation can also reduce daytime heating by several degrees, causing a reduction in evapotranspiration and other possible drought impacts. Smoke and dust particles – depending upon their concentration – also serve as cloud condensation nuclei (i.e., particles that water vapor can condense onto). With the right amount of suspended particles and water vapor in the air, cloud droplets may grow enough to cause precipitation, another important component to crop production. On the other hand, too many suspended particles could simply haze up the sky without encouraging those cloud droplets to grow.

Finally, smoke and dust can create health hazards, particularly for the elderly and those vulnerable to respiratory ailments. Be sure to monitor the Indiana Department of Environmental Management's near real-time air quality maps and data to assess air quality risk levels for your area before spending too much time outdoors. Figure 2 provides an example of one of their maps.

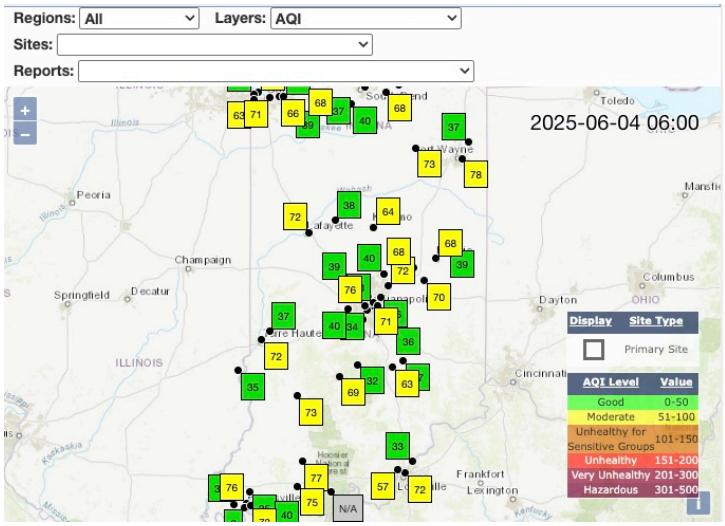

Figure 2. Example output from the Indiana Department of Environmental Management's near real-time air quality map. (https://www.in.gov/idem/airmonitoring/air-quality-data/).

Summer Cover Crops for Improved Soil Health and Weed Management

(Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955)

Summer cover crops offer clear benefits to vegetable growers and the environment. Cover cropping offers clear benefits to growers and the environment. It is a valuable opportunity to add organic material to the soil, and it increases soil carbon, enhances soil fertility and nitrogen cycling, reduces erosion, and helps to reduce weed pressure in subsequent cash crops. Building soil health requires a lot of biomass, and summer cover cropping can provide a sustainable solution. When planted after early spring vegetable harvests or during fallow periods, summer cover crops can transform bare soil into productive, biologically active ground that benefits successive crops. This article focuses on four proven summer cover crop options: sorghum sudangrass, sunn hemp, buckwheat, and cowpea.

Benefits of Summer Cover Crops

Summer cover crops provide multiple benefits for vegetable production systems. They protect soil from erosion during heavy summer rains, add organic matter to improve soil structure, and can supply significant amounts of nitrogen for the following crops when legumes are used. Non-leguminous cover crops can utilize nitrogen in the plant-soil system by assimilating it into the biomass. Cover crops suppress weeds while their abundant blossoms attract pollinators and beneficial insects, creating conditions for a more balanced farm ecosystem. Additionally, these living mulches help regulate soil temperature and conserve moisture during hot summer periods.

Sorghum Sudangrass (Sorghum × drummondii)

Sorghum sudangrass, sometimes called sudex, is a heat-loving hybrid cover crop species that excels at building biomass in hot conditions. No other cover crop is like sorghum-sudangrass for adding organic matter to soils, and it can produce impressive amounts of dry matter.

Figure 1. Sorghum sudangrass five weeks after seeding (Photo by Petrus Langenhoven).

Establishment and Management

In Indiana, a reliable establishment window is from May 20 to August. Earlier plantings will produce more biomass. Plant when soil temperatures reach 65°F or higher for best germination. Seeding rates range from 20 to 50 pounds per acre, with 30 pounds per acre for modest biomass production or 50 pounds per acre for effective weed suppression. Plan for 60-70 days to be an effective growth period.

Sorghum sudangrass grows up to 12 feet tall. Stalks can reach up to 0.5 inch in diameter, and the plants can generate very aggressive and large root systems. Under good conditions, the crop typically produces about 4,000 to 5,000 pounds of dry matter per acre.

Benefits and Considerations

Sorghum sudangrass is particularly valuable for building soil

organic matter and reducing root-knot nematode pressure. The crop's deep root system reduces subsurface hardness, making it excellent for improving soil structure. The extensive root system helps alleviate soil compaction and stabilize the soil while adding significant organic matter. It can be cut up to four times during the growing season, cutting it every 4-6 weeks.

Termination challenges are the most significant disadvantage to using sorghum sudangrass in a vegetable production system. The crop requires heavy-duty equipment like a flail mower and an offset disc harrow for effective termination, and needs about 40 pounds of nitrogen per acre at planting to grow well. Sorghum sudangrass produces a lot of biomass with a high C:N ratio, which may immobilize nitrogen and reduce nitrogen availability in the next crop. Intensive vegetable production systems can manage the nitrogen negative period by using integrated fertility management techniques.

Sunn Hemp (*Crotalaria juncea*)

Sunn hemp is a tropical legume that adapts well to temperate growing conditions, making it an excellent summer cover crop option. Its rapid growth rate combined with strong nitrogen-fixing ability makes it particularly valuable for producers seeking to add nitrogen, increase surface residue, suppress weeds during fallow periods, and enhance overall soil health.

Figure 2. Sunn hemp (Photo by Petrus Langenhoven).

Figure 3. No weeds are visible under Sunn hemp canopy (Photo by Petrus Langenhoven).

Establishment and Performance

Sunn hemp is a tropical plant, and the optimum soil temperature for planting is more than 50°F. In Indiana, the best time to establish Sunn hemp is between the first week of June and the end of July. Plant 15-25 pounds per acre at 0.5-1 inch depth.

Sunn hemp grows rapidly and can produce 2.5 tons of biomass and 120 pounds of nitrogen per acre over a 60-to-90-day period. Research shows it can be particularly effective when mixed with other summer covers. Sunn hemp and sorghum sudangrass are often mixed, creating complementary benefits.

Management Considerations

Mow Sunn hemp 60 to 90 days after planting. Its excessive plant height (up to 10 feet tall) and tough, fibrous stems make it difficult to cut and incorporate Sunn hemp after 90 days of growth. Sunn hemp can also be roller-crimped and used as a mulch. Temperatures below 28°F kill Sunn hemp. Plant at least 45 days before the first killing freeze in the fall.

Buckwheat (*Fagopyrum esculentum*)

Buckwheat is a fast-growing cover crop. Within 70-90 days, it blooms and reaches maturity. Its residue breaks down quickly after termination, making it ideal for short windows between vegetable crops.

Figure 4. Buckwheat seeded between pepper beds (Photo by Petrus Langenhoven).

Rapid Establishment and Weed Suppression

Buckwheat is one of a few cover crops that establish rapidly and easily. Seeds germinate in 3-5 days. The crop can be sown by mid-May and throughout the summer and is ideally grown for 35-40 days.

Buckwheat is ideal for suppressing (smothering) warm-season annual weeds. Its rapid growth allows the crop to cover the soil quickly. Research indicates that 60-70% early cover is sufficient to outcompete most weeds.

Nutrient Benefits

Buckwheat takes up phosphorus and some minor nutrients, which are later released to crops as the buckwheat crop residue breaks down. This phosphorus-scavenging ability makes buckwheat particularly valuable in vegetable systems where phosphorus availability can be limiting.

Seeding and Management

Plant 50-70 pounds per acre, either drilled or broadcast. Without additional fertilizer, buckwheat does well in fields with low nitrogen and phosphorus. Buckwheat's value peaks at 35 to 40 days after seeding, both for weed suppression and active-carbon contribution. If you do not want the buckwheat to reseed itself, terminate the crop at flowering (21-40 days after seeding).

Cowpea (*Vigna unguiculata*)

Cowpea is well adapted to drought (hot and dry) conditions, and it can produce a taproot that can reach up to 8 feet. The taproot helps the plant access water in dry areas and access soil minerals from deeper soil layers. This drought tolerance makes cowpea especially valuable during challenging growing seasons.

Figure 5. Cowpea summer cover crop at Full Hand Farm. Next season, this area will be used for tomatoes, and the tunnel will be pulled over it before tomatoes are planted (Photo by Liz Maynard).

Nitrogen Fixation and Performance

Cowpea is a very reliable summer legume cover crop. It can fix up to 70-150 pounds of nitrogen per acre. Dry matter production can reach 2,500 to 4,500 pounds per acre per year, depending on growing conditions. Cowpea can be planted as soon as soil temperatures reach about 65°F.

Management and Mixtures

Cowpea germinates fast (3-4 days) and can be terminated anytime. Allowing the crop to reach the flowering stage (40 days after seeding) will maximize the amount of nitrogen fixed. Seeding rates are 50-90 pounds per acre when planted alone or reduced proportionally in mixtures.

Therefore, cowpea and buckwheat could make a great cover crop mix. Both establish fast and flower quickly (30-40 days after seeding). Cowpea flowering time depends on the variety (some take up to 90 days). To increase nitrogen content, inoculate cowpea with the proper inoculant.

Limitations

Cowpea does not tolerate waterlogged soils. Heavy clay soils (especially during wet years) will produce poor cowpea performance. Additionally, complete termination is required in order not to compete with cash crops. Multiple passes are often required when tillage is the only method of termination. Other options include chemical termination or winterkill.

Species Mixtures and Combinations

The Midwest Cover Crops Council (MCCC) recommends several effective summer cover crop mixtures. Popular summer combinations include:

- Sorghum sudangrass + buckwheat for maximum biomass and weed suppression
- Cowpea + buckwheat for nitrogen fixation, plus rapid cover
- Sunn hemp + sorghum sudangrass for nitrogen plus organic matter

Regional Considerations and Timing

For Indiana and the broader Midwest, timing is critical for summer cover crop success.

1. What is the cover crop planting date?
2. How much time is there until the fall crop is to be planted?

Plan planting dates to allow adequate growth time while ensuring termination before fall crop establishment.

When selecting species and timing, consider local climate patterns and residual herbicide effects. Herbicide residues from previous crops can affect cover crops such as buckwheat, especially when no-till seedbeds are used.

Termination Strategies

Successful termination is essential for effective cover crop management. Mowing (flail mowing works best, but rotary mowers could also be used) is often the first step, but complete termination may require additional tactics. Plan for appropriate equipment and timing to ensure clean fields for subsequent crops.

Recommendations for Growers

Summer cover crops offer vegetable growers powerful tools for improving soil health, managing weeds, and enhancing overall system sustainability. To maximize success with summer cover crops, consider these specific recommendations:

Species Selection Based on Primary Goals:

- **Choose sorghum sudangrass** when building soil organic matter and alleviating compaction are priorities
- **Select sunn hemp** for nitrogen fixation (120+ lbs N/acre) and rapid biomass production in 60-90 days
- **Plant buckwheat** for quick weed suppression in short windows (35-40 days) and phosphorus scavenging
- **Use cowpea** in drought-prone areas or sandy soils where reliable nitrogen fixation is needed

Timing and Establishment:

- **Start planting** when soil temperatures reach 65°F consistently (typically late May in Indiana)
- **Allow adequate growing time**: 60-70 days for sorghum sudangrass and sunn hemp, 35-40 days for buckwheat, 40+ days for cowpea to reach flowering
- **Plan termination timing** to allow 2-3 weeks before fall crop establishment

Management Practices:

- **Inoculate legumes** (sunn hemp and cowpea) with appropriate rhizobia for maximum nitrogen fixation
- **Control existing weeds** before planting cover crops to ensure successful establishment
- **Use proper equipment** for termination—flail mowers work best for tall, fibrous species like sorghum sudangrass
- **Apply 40 lbs N/acre** to sorghum sudangrass if maximum biomass production is desired

Mixture Recommendations:

- **Combine cowpea + buckwheat** for nitrogen fixation plus rapid weed suppression
- **Mix sorghum sudangrass + buckwheat** for maximum biomass and early ground cover
- **Plant sunn hemp + sorghum sudangrass** for balanced nitrogen and organic matter benefits

Key Success Factors:

- **Prepare a firm, weed-free seedbed** for uniform establishment
- **Ensure good seed-to-soil contact,** especially for small-seeded species like buckwheat
- **Monitor growth closely** and terminate on time to prevent management difficulties
- **Plan for adequate termination equipment** before planting tall-growing species

For specific recommendations and local adaptations, consult the Midwest Cover Crops Council resources at midwestcovercrops.org and work with your local Extension educator to develop a cover crop strategy tailored to your operation.

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Indiana Horticultural Society Summer Meeting Showcases Fruit and Vegetable Production at Chandler's Orchard and Country Market- July 9

(Peter Hirst, hirst@purdue.edu)

Chandler's Orchard and Country Market, located in Filmore, 30 miles west of Indianapolis, will host the Indiana Horticultural Society summer meeting on July 9.

The farm was founded by Jerry Chandler in 1975 and is currently operated by his son Matt and his family. They grow about 75 varieties of apples, including common varieties like Cameo, Golden Delicious, Jonagold, and Honey Crisp, to more unique varieties like Priscilla, Brown Russet, Blue Pearmain, Strawberry Pippin, Hudson's Golden Gem, and more. Other fruits grown include strawberries, raspberries and peaches. They also make fresh cider.

They also offer a wide selection of local vegetables including tomatoes, sweet corn, green beans, sweet potatoes, pumpkins and peppers.

Most of the products grown are sold at the farm store located on Highway 40 W. As well as fruits, vegetables, cider, and slushies, other agritourism activities are also offered, such as pick-your-own strawberries, apples, and pumpkins. One unique feature is horse-drawn hayrides featuring Percheron draft horses, known for their size and beauty. Bees are also kept on the farm to assist with pollination and produce honey that is sold at the farm store. They also operate an online store through their website.

For more information on the farm, visit their website

https://www.chandlersorchard.com

Address

Chandler's Orchard and Country Market

2849 S Co Rd 825 E, Fillmore, Indiana 46128

Time

We will start at 9:30 a.m.

During this one-day summer meeting, we will visit fruit production, vegetable production, and get an overview of agritourism activities.

Beverages and lunch will be available on site.

We hope to see you there.

Discover Small-Scale Farming Solutions at Purdue's Educational Field Day

(Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955)

Mark your calendars for July 24, 2025 – the Purdue Small Farm Education Field Day promises to be an invaluable resource for small-scale farmers and urban growers across Indiana.

The Department of Horticulture and Landscape Architecture, in partnership with the Purdue Student Farm, is hosting this comprehensive educational event from 8 a.m. to 2 p.m. at the Purdue Student Farm, located at 1491 Cherry Lane in West Lafayette. This field day creates a unique opportunity for small farm operators and urban growers to learn from Purdue University and Purdue Extension experts while connecting with fellow agricultural enthusiasts.

Hands-On Learning with Expert-Led Demonstrations

The heart of this field day lies in its diverse array of practical demonstrations, each designed to address real challenges faced by small-scale producers. From 9 a.m. to noon, attendees can participate in 20-minute focused sessions, with groups limited to just 10 participants to ensure personalized attention and optimal learning.

Production and Crop Management sessions will cover essential topics, including sweet pepper variety selection for high tunnel production, based on comprehensive research evaluating over 40 varieties since 2018. Attendees will gain insights from detailed 2024 performance data highlighting the top ten colored sweet pepper varieties for Midwestern growing conditions. The raised bed demonstration explores various materials, configurations, and heights used in vegetable production, helping growers understand the pros and cons of this popular growing method.

Pest Management and Food Safety components address critical operational concerns. Learn to use pheromone-baited traps for monitoring tomato pinworm populations – a relatively new pest affecting Indiana's high tunnel tomato production. The packinghouse design session focuses on preventing cross-contamination and implementing food safety measures, regardless of operation size.

Equipment and Tools demonstrations provide hands-on experience with essential farming implements. The comprehensive equipment showcase features everything from hand tools like stirrup hoes and broadforks to specialized seeders,

transplanters, and tractor attachments. Participants can also master the art of tool maintenance in the “Hoes 101” session, where they’ll learn to use and sharpen various hand-weeding implements.

Innovative Techniques sessions highlight cutting-edge approaches to sustainable farming. Discover how to calibrate push seeders for precise fertilizer application, explore the potential of rolled sunn hemp as a cover crop for no-till garlic production, and learn about integrated crop-livestock systems using goats for site preparation compared to traditional tarping or tilling methods.

2024 Small Farm Education Field Day (Photo by Joshua Clark).

Flexible Learning Opportunities

Beyond the scheduled demonstrations, several drop-in sessions offer flexible learning throughout the event. Visit the hydroponic shipping container demonstration to see innovative controlled-environment agriculture in action, or explore the ongoing small farm equipment showcase at your own pace.

The “Farm Hacks” session promises to unveil creative solutions that enhance productivity, efficiency, and sustainability on small-scale operations – perfect for farmers seeking innovative approaches to common challenges.

Research-Based Expertise

What sets this field day apart is its foundation in solid research and practical application. As Petrus Langenhoven, Purdue Student Farm director, notes, “This field day creates a vibrant hub where small farm operators and urban growers from across Indiana converge. We’ve consistently seen participants implement specific techniques learned here to enhance their own farms and urban gardens. Often, it’s the nuanced practices – details we as educators might overlook – that dramatically transform the productivity and sustainability of small-scale agricultural operations.”

The event showcases ongoing research from multiple projects, including multi-year sweet pepper variety trials, innovative cover crop systems, and integrated crop-livestock approaches that could revolutionize small-scale farming practices.

2024 Small Farm Education Field Day (Photo by Joshua Clark).

Registration and Event Details

Registration costs $40 per person, with discounted rates available for students and Extension educators. While lunch isn’t included, attendees will receive a complimentary Kona ice cup, and a food truck will be available on-site for meal purchases.

This field day is designed for market gardeners, commercial growers, agricultural educators, and anyone interested in small-scale or urban agriculture. Whether you’re a seasoned farmer looking to optimize your operations or someone just starting their agricultural journey, you’ll find valuable, research-backed insights that can be immediately applied to your growing practices.

Register now at the Purdue Small Farm Education Field Day website. Don’t miss this opportunity to learn from experts, connect with fellow growers, and discover practical solutions that can transform your farming operation. Space is limited for demonstrations, so early registration is encouraged to ensure your spot at this comprehensive educational event.

Purdue Extension Launches Statewide Cut Flower Tour Series to Support Indiana Growers

(Emily Evers, everse@purdue.edu)

Aspiring and established cut flower growers across Indiana will soon have a unique opportunity to learn, connect, and grow through a new series of **Cut Flower Tours** offered by Purdue Extension and hosted throughout the state this season.

Hosted in collaboration with leading local growers and agricultural partners, these on-site tours are designed to give current and future cut flower producers hands-on insights into successful farm operations, sustainable growing practices, floral business strategies, and more.

Whether you're just starting out or are an experienced grower looking to expand or refine your practices, these tours will offer:

- A guided tour of our working cut flower farm, walking through seasonal crops and growing systems
- In-depth discussion on soil prep, crop planning, succession planting, and harvesting techniques
- Tips on variety selection, pest management, and growing for floral designers or farmer's markets
- Talk about startup costs, tools, and lessons learned
- Time for Q&A, networking, and sharing ideas with fellow aspiring growers

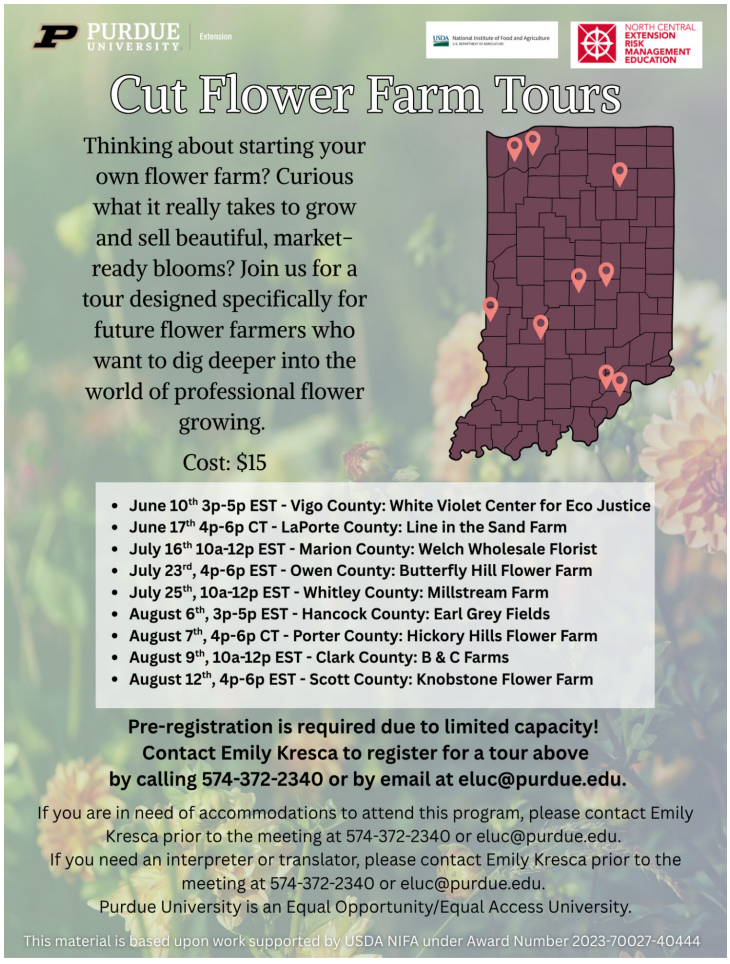
Each tour costs $15 per person. Pre-registration is required due to limited capacity.

Host sites for these tours include Vigo, LaPorte, Marion, Owen, Whitley, Hancock, Porter, Clark, and Scott counties.

For more information, register at https://edustore.purdue.edu/extension-programs/ag-natural-resources.html or contact Emily Kresca at 574-372-2340 by phone or eluc@purdue.edu by email.

If you are in need of accommodations to attend this program, please contact Emily Kresca prior to the event at 574-372-2340 or eluc@purdue.edu at least one week before the event.

This material is based upon work supported by USDA NIFA under Award Number 2023-70027-40444



Mechanical Weed Control Field Day at the University of Kentucky – September 23

(Alexis Sheffield, alexis.sheffield@uky.edu)

I'm excited to share that the University of Kentucky Center for Crop Diversification (UK CCD) and the Organic Association of Kentucky (OAK) are partnering with Glacial Drift Enterprises to host a *Mechanical Weed Control Field Day* on **September 23** at the University of Kentucky Horticulture Research Farm in Lexington.

Like many of your states, Kentucky is home to a growing number of small- to mid-sized specialty crop producers who are seeking effective, scale-appropriate tools to improve efficiency and productivity. Last year, OAK and CCD took two vanloads of Kentucky farmers to the Midwest Mechanical Weed Control Field Day, and several have since made significant investments in new weed control equipment inspired by what they saw there.

This upcoming field day aims to provide similar inspiration and technical insight, not just for Kentucky growers and advisors, but also for those from neighboring states facing comparable challenges. The event will include educational sessions, field demonstrations, and a trade show featuring innovative physical weed control tools now available for smaller-scale specialty crop farms.

We hope you'll consider attending.

Please feel free to contact Alexis Sheffield at 859-257-5635 or email her at alexis.sheffield@uky.edu if you have any questions.

Meteorological Summer Has Arrived

(Austin Pearson, pearsona@purdue.edu, (765) 675-1177)

We've made it! Meteorological summer started on June 1, but the official start of summer isn't until June 20. The days are longer, temperatures have risen, and my allergies are in full swing. I let the dogs out last night, and there was still quite a bit of light in the sky just before 10:00 PM EDT, which also makes it hard to get the kids to go to bed at a decent time. Who cares, though? It's summer, right???

June started much cooler than usual, with many areas in central and northern Indiana experiencing temperatures in the mid-30s. Indiana Dunes National Park recorded a low of 34°F on June 2, marking the coldest June temperature ever recorded at this station since records began in 1989. While this record doesn't span that many years, Farmland 5 NNW, located in Randolph County, recorded a low of 35°F, matching the record set on June 1, 1966 (records dating back to 1893). Reports of frost emerged in some locations as a result. However, just two days later, Indiana Dunes National Park reached a high of 89°F. Overall, average temperatures across the state have been near normal to 1-2°F below normal, particularly in northern Indiana. This trend has remained fairly consistent since May 1 and is evident in the modified growing degree day (MGDD) accumulations. Much of the Midwest is 40-80 heating units behind normal since May 1 (Figure 1). This is not a significant deviation and is not expected to cause much delay in crop maturity. Temperatures are rising and will continue to warm this month, as the Climate Prediction Center expects Indiana to end June with above-normal temperatures.

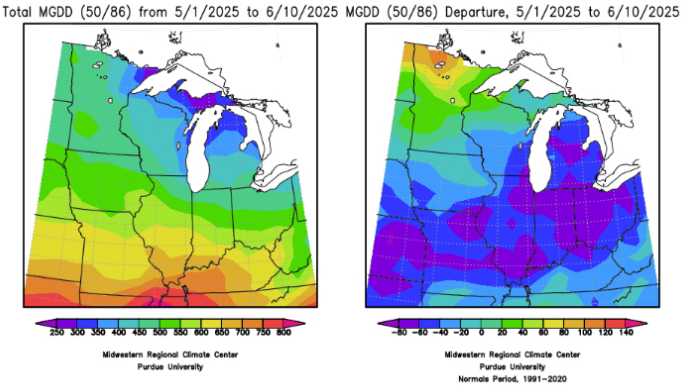


Figure 1: MGDD accumulations and departure from the climatological average for May 1 to June 10, 2025.

In May, precipitation levels across much of northwestern Indiana fell below normal, leading to the development of abnormally dry (D0) and moderate drought (D1) conditions, according to the US Drought Monitor. However, precipitation increased slightly in June within this region. There was a slight improvement on June 10, with the D1 area decreasing by just over 4 percent (Figure 2). D0 conditions on the eastern edge of D1 improved due to last week's heavy rains. Much of central and southern Indiana received above-normal rainfall, which caused localized ponding and flooded crops. On June 5, many stations reported over 3 inches of rain, with Lagro 3.5 ESE (White County) recording the highest at 3.55 inches. That morning, my CoCoRaHS gauge recorded 2.62 inches in southwestern Howard County, while just a few miles to the east, the total was 3.21 inches. Quite a difference!

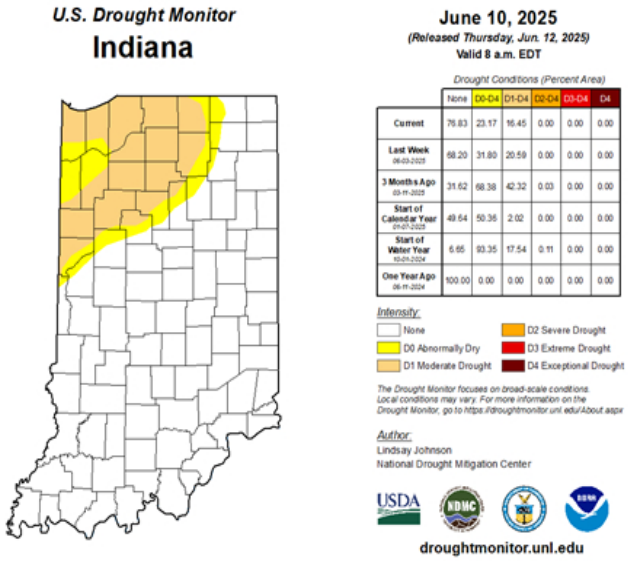


Figure 2: US Drought Monitor Map for June 10, 2025.

In the near term, it looks like we may see continued above-normal rain. The Climate Prediction Center has increased confidence in above-normal precipitation through June 25, although this month has equal chances for above-normal or below-normal precipitation. Similarly, summer precipitation also presents equal chances, but we should have more information next week when the new outlooks will be released.

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