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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!

In this issue, we bring you a diverse range of content to support your farming operations. We hope these insights help you navigate the challenges and opportunities of this critical time in the growing 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

Indiana Home-Based Vendor Handbook Now Available

(Tari Gary)

As produce bounties are harvested this summer, many growers may explore options to transform excess perishable products into value-added goods such as baked goods, jams and jellies, and more. Current Indiana regulations allow individuals to make certain products in their home kitchen and sell those direct-to-consumer as a home-based vendor (HBV). However, there are several products that carry an inherent food safety risk that cannot be made in someone's home and sold by an HBV.

Figure 1: Jam for sale at a farmer's market. Photo copyright 2016 Purdue University College of Agriculture.

In Indiana, home-based vendors are NOT permitted to make or sell foods that have been identified as time/temperature control for safety (TCS). While Indiana has previously identified foods as TCS or non-TCS, there are many food products that are not clearly defined, creating confusion surrounding which products are approved for HBV production. To provide clarity and scientific support on this topic, Purdue University conducted a study on a series of commonly produced HBV products to determine their food safety profile.

A team of Purdue researchers prepared food products and investigated the intrinsic properties of finished potential HBV products, specifically to identify their water activity and pH, to determine if pathogen growth was supported. In food science, it is recognized that pathogens cannot grow in a food if the water activity (Aw) is less than 0.85 or the pH is below 4.6. For some products that undergo a kill step, internal temperature data were collected and compared to lethality temperatures for the microbes of concern. The team also looked at properties that may impact legality, such as the alcohol content in applicable foods. Finally, researchers investigated the oxygen permeability of different packaging materials to determine which materials can safely be used by HBVs.

During the study, researchers aimed to capture the pH and Aw variabilities that could result while using certain ingredients or different recipes. For example, researchers were interested in whether fruits such as apples of different varieties or ripeness could impact the final product's pH.

To summarize the findings and recommendations from this research, the Indiana Department of Health recently published the Indiana Home-Based Vendor Handbook in partnership with Purdue University and Health First Indiana. With the integration of academic resources and state laws, this handbook is intended to serve as a comprehensive guide to identify food products that can be safely prepared and sold within the State of Indiana under Home-Based Vendor (HBV) Regulations. This handbook also outlines other requirements for HBVs, including sanitary procedures, labeling, food safety training, and where products can be sold.

If HBVs have questions regarding allowable products, they should contact the local health department in the county where they intend to sell the product. Questions may also be submitted to the Indiana Department of Health (IDOH) Retail Food Program by emailing retailfoodprogram@health.in.gov. Questions related to product formulation, testing, and potential projects can be directed to Purdue's Food Entrepreneurship and Manufacturing Institute (FEMI) by emailing femi@purdue.edu.

A Bit of Rain Coming Our Way

(Beth Hall, hall556@purdue.edu)

The last few weeks have been on the drier side, particularly for northwestern and west-central Indiana (Figure 1). While temperatures have been seasonal, they are still gradually increasing as we approach summer. Therefore, evapotranspiration rates are starting to increase. This has resulted in the U.S. Drought Monitor classifying much of northern Indiana as Abnormally Dry (D0) (Figure 2). Technically, this is not drought, but more a cautionary tale that conditions are drying. The National Weather Service predicts that around two inches of rain will fall across the western and southern parts of the state over the next seven days (Figure 3). A little over half of this will likely come at the end of this week, followed by a break for early next week, closing with another round of decent precipitation next Tuesday-Thursday. It is too early to know if this will be enough to eliminate the Abnormally Dry (D0) areas in our state, but it should not degrade things into official drought status.

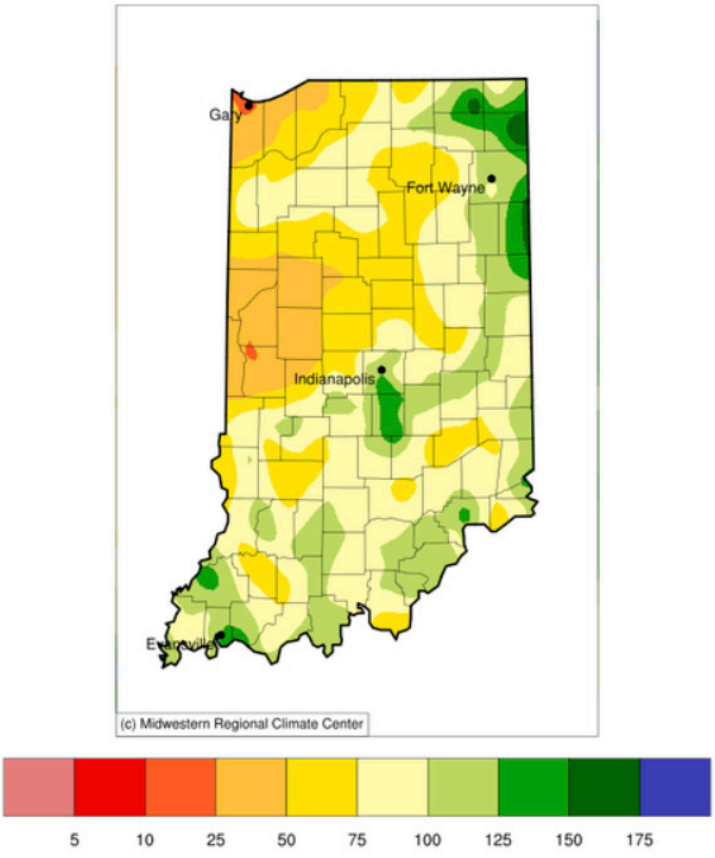

Figure 1. Precipitation from May 1 – 14, 2025, represented as a percentage of the 1991-2020 normal amounts for that period.

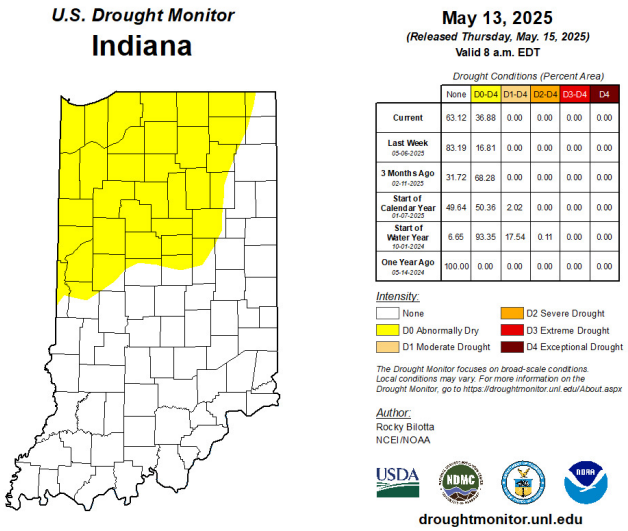

Figure 2. U.S. Drought Monitor status for conditions as of Tuesday, May 13, 2025.

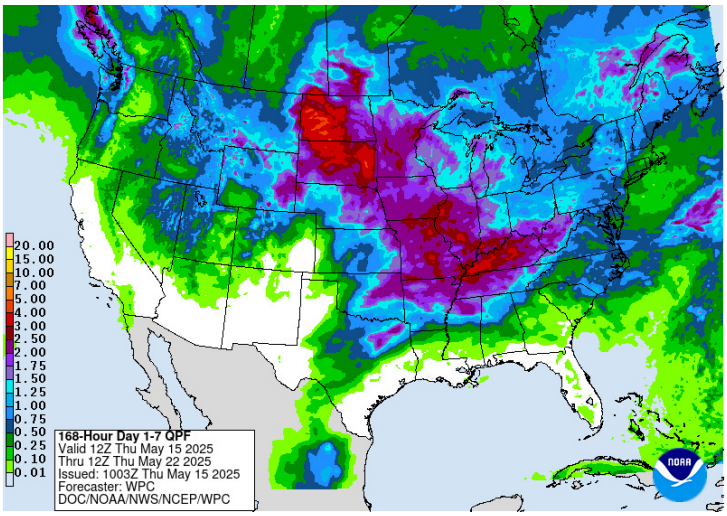

Figure 3. 7-day precipitation total forecasted for May 15-22, 2025.

Another thing that will help stave off drought is that the National Climate Prediction Center favors below-normal temperatures for the last few weeks of May. There is no concern at this time for freezing temperatures, but it should keep temperatures pleasant with lower evapotranspiration rates. Climate outlooks for June are slightly favoring above-normal temperatures across Indiana, with above-normal precipitation possible for our eastern counties. The 3-month (June-July-August) outlook is slightly favoring above-normal temperatures with no statistically significant guidance about precipitation.

Accumulated modified growing degree days (50°F/86°F) (MGDD) since April 15th (Figure 4) are running around 10-50 units above normal (Figure 5). With the cooler climate outlooks for the rest of this month, expect that pattern of near-normal MGDD accumulations to continue.

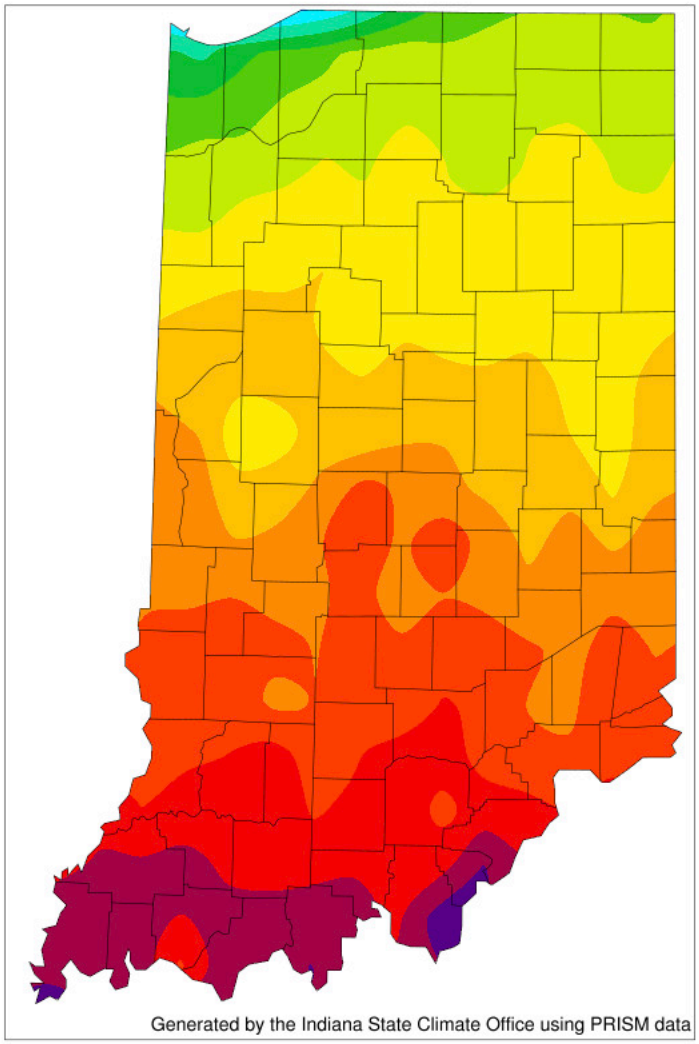

Figure 4. Modified growing degree day (50°F / 86°F) accumulation from April 15 – May 14, 2025.

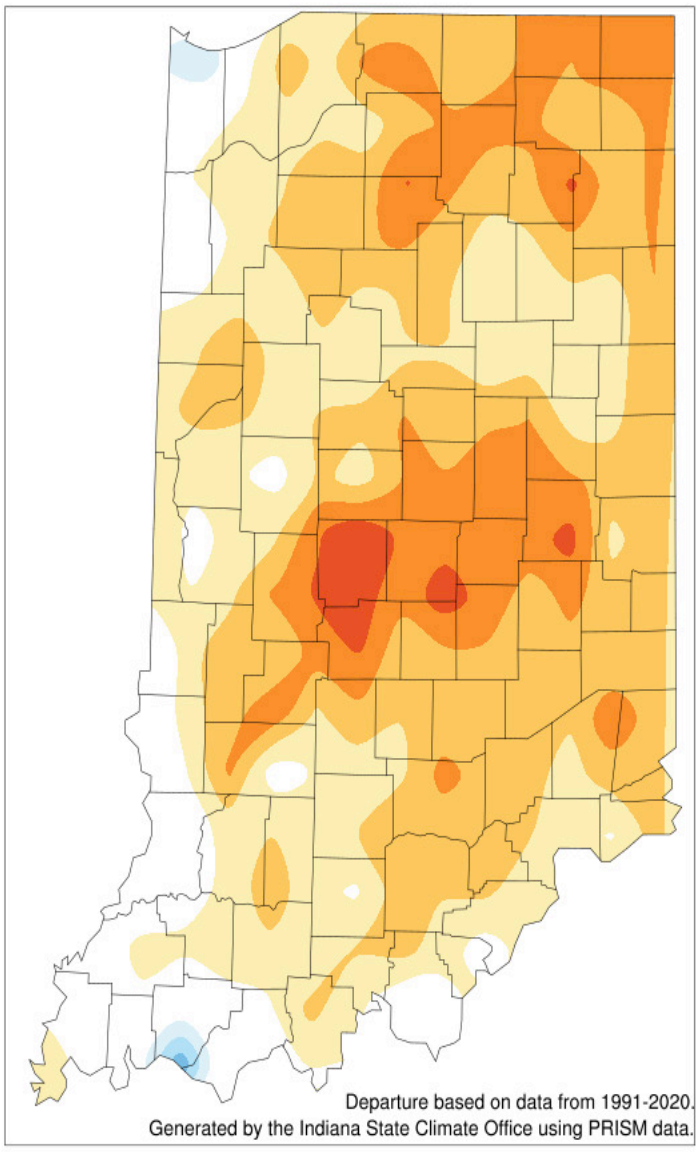

Figure 5. Modified growing degree day (50°F / 86°F) accumulation from April 15-May 8, 2025, represented as the departure from the 1991-2020 climatological average.

Performance of Strawberries on Black vs. White Plastic Mulches in Indiana

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198), (Jeanine Arana, jcordone@purdue.edu, (765) 588-7787) & (Stephen Meyers, slmeyers@purdue.edu, (765) 496-6540)

From 2022-2024, we evaluated the performance 15 strawberry cultivars grown in plasticulture system using black and white-on-black plastic mulches (Figure 1) at two locations: Southwest Purdue Agricultural Center in Vincennes, IN (USDA hardiness zone 6b), and Meigs Purdue Agricultural Center in Lafayette, IN (USDA hardiness zone 6a).

Figure 1. 'Camarosa' strawberry grown in black (left) and white-on-black (right) plastic mulches at Lafayette, IN on October 13, 2022 (Photo credit: Jeanine Arana).

Strawberries were harvested for two seasons. Plug plants were used in the study and were transplanted on September 7, 2022, at the Vincennes location and on September 8, 2022, at the Lafayette location. The trial ended after the second years' harvest in June 2024.

During the experimental period, the monthly average temperatures at the Vincennes location were 1.4 to 5.0 °F higher than that at the Lafayette location. The soil type at the Vincennes location is an Alvin fine sandy loam, while the soil at the Lafayette location is a mix of the Toronto silt loam and Millbrook silt loam complex and Drummer silty clay loam.

In this article, we summarize the effects of plastic mulch color on strawberry performance over two harvest seasons and offer insights to help guide the choice between black and white plastic mulch for plasticulture strawberry production in Indiana.

Study Findings

The effects of mulch color varied by year and location, though trends were generally consistent across cultivars. In 2023, the yields at both locations were negatively impacted by frost damage, with particularly severe losses at the Lafayette site.

Fruit production — At the Vincennes location in 2023, plants grown on black plastic mulch produced significantly higher yields (average across 15 cultivars: 0.69 lbs/plant) than those on white plastic mulch (0.56 lbs/plant). No significant difference was observed at the Lafayette location, likely due to the extent of frost damage. In 2024, yields were higher on black plastic mulch (0.92 lbs/plant) than on white plastic mulch (0.63 lbs/plant) at the Lafayette location. However, the trend reversed in the second year harvest at Vincennes, where plants grown on white plastic mulch yielded more (1.07 lbs/plant) than those on black plastic mulch (0.91 lbs/plant).

At the Lafayette location, fruit harvested from plants grown on black plastic mulch were consistently larger in both years compared to those from white plastic mulch. No significant differences in fruit size were observed at the Vincennes location.

Earlier harvests (by approximately 7–10 days) were observed on black plastic mulch during the first year in Vincennes and the second year in Lafayette. This effect was not seen during the second year at the Vincennes site.

When combining yield data from both years, black plastic mulch produced significantly higher yields than white plastic mulch at the Lafayette location (1.16 vs. 0.84 lbs/plant). In Vincennes, opposing trends across the two years resulted in similar total yields between mulch types: 1.63 lbs/plant on white plastic and 1.60 lbs/plant on black plastic.

Plant survival — Prior to the second year's harvest, plant survival at the Vincennes site was lower on black plastic (76%) compared to that on white plastic mulch (84%). The lower plant survival was likely due to greater heat and drought stress the plants faced on black plastic during the summer following the first harvest. In Lafayette, overall survival was higher (93%), with no significant difference between mulch types.

Runner development — Across both locations and cultivars, plants grown on white plastic mulch consistently produced more runner biomass during the summer following the first harvest compared to those grown on black plastic mulch.

Factors to Consider When Choosing Between Black and White Plastic Mulches for Strawberry Production

If maximizing yield is the top priority, black plastic mulch may be the preferred option. Plasticulture strawberry yield is largely determined by the number of branch crowns, which develop primarily in the fall. Black plastic mulch led to higher soil temperature compared to white plastic mulch, creating more favorable conditions for branch crown formation, and potentially resulting in higher yields the following spring.

However, there is likely a threshold for the number of branch crowns that can support optimal yields, which may be influenced by factors such as cultivars and fertilizer input. Once this limit is reached, additional crown development may not translate into increased yield. This may help explain the results observed in the second year's harvest at the Vincennes location.

Runner production is undesirable in plasticulture systems. To prevent daughter plants from establishing, runners need to be removed promptly during the summer following the first year's harvest. Plants grown on white plastic mulch tend to produce more runner biomass, which may increase the labor required for runner removal.

One advantage of using white plastic mulch over black is its ability to keep the soil surface cooler. This can be particularly beneficial in situations where ripe fruit remains on the mulch for an extended period before harvest, such as in u-pick operations. Additionally, the cooler soil temperatures may enhance plant survival during the summer following the first year's harvest—especially in soils with lower water-holding capacity, which tend to heat up more and impose greater water stress on crops during hot, dry conditions.

Frost damage is one of the major challenges in plasticulture strawberry production in Indiana. For fields without overhead irrigation, floating row covers must be readily available and deployed promptly when frost or freeze events occur during the critical flowering period. Using white plastic mulch may help delay flowering compared to black plastic mulch, potentially reducing frost risk to some extent.

However, this strategy does not guarantee reduced risk, as late frost events can still occur as late as May in southern Indiana. In some cases, we observed that frost caused more damage to later-blooming plants than to earlier-blooming ones, as the early bloomers had already set fruit by the time the frost occurred. To better mitigate frost damage, we recommend consistently implementing frost protection measures whenever there is a risk and strategically spreading peak bloom timing—either by planting cultivars with different bloom periods, using a combination of black and white plastic mulches, or using straws for winter protection.

A detailed discussion of the cultivar evaluation results will be provided in a forthcoming article.

Temperature Effects on Potassium Uptake: Managing Heat Stress for Better Tomato Quality

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

For tomato growers, managing potassium (K) nutrition is critical for both yield and fruit quality. While most producers understand K's importance, many don't realize how significantly temperature influences a plant's ability to uptake and utilize this essential nutrient. With increasing heat extremes, understanding this relationship becomes even more crucial for successful production.

The Temperature-Potassium Connection

Potassium Uptake

Research shows that potassium uptake in tomato plants is highly temperature dependent. Studies conducted by Tindall et al. (1990) found that K uptake peaks at a root zone temperature of approximately 80°F. Their research revealed:

- **Optimal uptake range**: K uptake performs best when root zone temperatures are between 70-80°F
- **Cold and hot stress**: Both excessively low (below 68°F) and high (above 86°F) root temperatures substantially reduce K uptake
- **Quadratic response**: K uptake increases as temperatures rise from cool to optimal, then decreases sharply as temperatures become too hot

This relationship helps explain why we sometimes observe quality issues such as yellow shoulder disorder (YSD) and uneven ripening, even when soil tests indicate adequate K levels. When roots get too hot, plants simply can't access the K that's present in the soil.

Fruit Exposure to Sunlight

Yellow shoulder disorder (YSD) presents as sectors of yellow or green tissue under the peel of tomato fruit, creating quality issues that significantly impact grading and processing efficiency. This condition results from a complex interplay of several factors. High temperatures inhibit or prevent the production of lycopene (the red pigment in tomatoes), with symptoms appearing first at the fruit shoulder where direct sunlight exposure is highest. Research has consistently demonstrated a strong relationship between potassium deficiency and YSD, with studies showing that soil K levels are negatively correlated with both the frequency and severity of the disorder. When plant tissue potassium levels drop from adequate (4-6%) to low (2-3%), yellow shoulder becomes more prevalent, particularly during periods of high temperature and intense sunlight. Rather than simply being a delayed ripening issue, ultrastructural analysis reveals that YSD affects cell enlargement early in fruit development, making it an altered developmental process. Growers can minimize YSD by selecting varieties with the uniform ripening trait, ensuring adequate foliage cover to protect fruits from excessive sunlight, and most critically, maintaining sufficient potassium levels in the soil. However, even with very high potassium applications, yellow shoulder may still occur to some degree during seasons with drought conditions and extremely warm, sunny weather.

How Heat Stress Impairs Potassium Uptake

Recent studies by Giri (2013) have identified the molecular mechanisms behind heat-induced K deficiency. When root zone temperatures exceed 95°F:

1. **Transport protein reduction**: Heat stress decreases the concentration of KT1, the main potassium transporter protein in roots
2. **Energy deficit**: High temperatures interfere with photosynthesis, reducing the energy available for active transport of K across cell membranes
3. **Slow recovery**: After severe heat stress (above 104°F), K uptake systems take a week or more to recover fully

The research found that roots were more affected by heat than shoots, as indicated by a decrease in the root-to-shoot mass ratio. This explains why fruit quality issues often appear during hot weather, even when foliage looks healthy.

Implications for Tomato Production Practices

To maintain optimal K nutrition during hot weather, consider these management strategies:

1. **Temperature Management**
    - Use light-colored mulch in hot weather to reduce soil temperature
    - Schedule irrigation for later in the day to help cool root zones and increase soil moisture content
    - In high tunnels, ensure proper ventilation and consider using a 30% black shade cloth, that is applied over the tunnel, when temperatures exceed 90°F
    - Promote deeper rooting where soil temperatures are more moderate. Assure that K levels are adequate
2. **Nutrition Program Adjustments**
    - **Timing is critical**: Begin monitoring tissue K levels at first flowering—tissue K should exceed 3% by dry weight
    - **Increase availability during heat**: During hot periods, apply K through fertigation to enhance availability
    - **Maintain proper ratios**: Keep potassium levels 2-3 times higher than soil nitrogen during fruiting. During fruiting, the high demand for K shifts the overall nutrient balance, impacting the availability of nutrients such as nitrogen. The prioritization of K uptake could potentially reduce the absorption and translocation of nitrogen
    - **Consider K form**: Research shows that the particle size of potassium sulfate significantly affects its availability. Some large particles (several mm in diameter) may remain intact for years without dissolving
3. **Varietal Selection**
    - Select varieties with heat stress tolerance and tolerance to abiotic disorders such as uneven ripening, internal white tissue, or yellow shoulder.

In a 2019 study at the University of Delaware, researchers found significant differences in susceptibility to heat-induced quality issues (Johnson and Carvel, 2019). Varieties with a low incidence of white tissue under high temperatures included Jamestown, Primo Red, and Red Bounty, while Camaro, Mountain Merit, Mountain Fresh, Red Snapper, Marshall, and Myrtle showed high susceptibility.

Diagnosing Potassium-Related Quality Issues

Yellow shoulder disorder (YSD) and uneven ripening are the most common symptoms of inadequate K availability during fruit development. These disorders are characterized by:

- Areas of yellow or green tissue under the fruit peel and in walls of tomato fruit
- Uneven coloration during ripening
- Lower quality and value of harvested fruit
- Increased susceptibility during hot weather

Remember that visual symptoms alone don’t always indicate the timing or severity of K deficiency. Regular tissue testing throughout the season provides the best guidance for nutrient management.

Recovery from Heat Stress

The good news is that K uptake systems can recover after heat stress. Research indicates that when temperatures return to optimal levels, K uptake recovers more quickly than other nutrients, such as nitrogen and phosphorus. After severe heat stress, allow at least 7 days for full recovery of the K uptake system. Maintaining adequate soil moisture during recovery is essential, as K uptake depends on active transport through well-hydrated root systems.

Conclusion

Tomato growers can significantly improve fruit quality, even during challenging weather conditions, by understanding how temperature affects K uptake and implementing management strategies that optimize root zone conditions. Regular monitoring of both soil and tissue K levels, combined with temperature management and appropriate variety selection, provides the best defense against heat-induced quality problems.

Resources

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Insect Spotlight: Thrips

(Leslie Alejandra Aviles Lopez, lavilesl@purdue.edu) & *(Laura Ingwell, lingwell@purdue.edu, (765) 494-6167)*

Thrips are soft-bodied insects belonging to the order Thysanoptera. They are tiny, slender, and characterized by their fringed wings (Figure 1). While many thrips species are considered agricultural pests, some are beneficial predators. One important pest species is the western flower thrips (*Frankliniella occidentalis;* Figure 2), which can cause significant damage to crops. In contrast, there are also predatory thrips, such as the banded thrips (*Aeolothrips fasciatus*; Figure 3) that help suppress soft body pest populations.

Figure 1. Thrips with fringed wings. Photo retrieved from https://commons.wikimedia.org/wiki/File:202202_Frankliniella_occidentalis.svg.

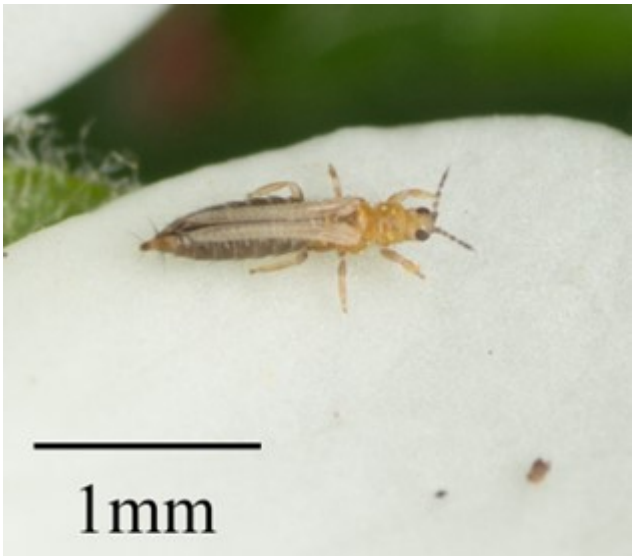


Figure 2. The western flower thrips (Frankliniella occidentalis) adult. Photo retrieved from https://commons.wikimedia.org/wiki/File:Frankliniella_occidentalis_14827651.jpg

Figure 3. Predatory banded thrips adult (Photo by John Obermeyer).

Fun Fact: Thrips is always plural; you may have one thrips or 100 thrips.

Life cycle

Females of most plant-feeding thrips species lay their elongated, cylindrical to kidney-shaped eggs within plant tissue. These eggs hatch into larvae (Figure 4) that feed on the plant for several weeks before dropping to the soil to pupate. Adult thrips typically live for about a month, during which they feed, mate, and reproduce. Thrips can have multiple generations per year, and under warm conditions, their life cycle from egg to adult can be completed in as little as two weeks. Both larvae and adults prefer to feed on pollen, which is often found inside flowers.

Figure 4. Two thrips larvae on the underside of a tomato leaf (Photo by John Obermeyer).

Damage

Both larvae and adult thrips cause damage to plants. They puncture plant cells and feed on the contents, including xylem sap, often leaving behind dark frass spots (insect poo). The damage appears as silvery or bleached patches, as if the leaf surface has been rasped or scraped (Figure 5). While light feeding typically results in cosmetic damage, severe infestations can lead to leaf curling, stunted growth, and even plant death. When thrips feed directly on the fruits, they damage the appearance (Figure 6). In addition to direct feeding damage, thrips are important vectors of plant viruses. Species like the western flower thrips and onion thrips can transmit viruses such as *Tomato spotted wilt virus* (see this article), *Tomato chlorotic spot virus*, and *Iris yellow spot virus*. Virus symptoms vary depending on the host plant and environmental conditions; therefore, accurate diagnosis may require sample submission to the Plant and Pest Diagnostic Lab.

Figure 5. Thrips feeding damage on tomato leaves (Photo by Laura Ingwell).

Figure 6. Thrips feeding damage on the surface of tomato fruits (Photo by Laura Ingwell).

Figure 7. Orius predator foraging for thrips on a tomato plant (Photo by Laura Ingwell).

Monitor

Adult thrips become active in the spring and are most effectively monitored using yellow sticky traps, visual inspection, or by identifying feeding damage. Because thrips are small and difficult to detect, visual scouting is often focused on plant blooms, where they tend to concentrate. One effective monitoring technique is to shake flowers or leaves over a white sheet of paper and observe any thrips that fall onto the surface. It's also helpful to inspect the bases of leaves and areas of new growth, where thrips may congregate. Sticky cards can be placed near flowers or young foliage to improve detection.

Management

Sanitation is a critical component in managing thrips and the viruses they transmit. Weeds and plant debris near susceptible crops should be removed to reduce potential sources of infestation. Reflective mulches can also be used to disrupt thrips' ability to locate host plants by interfering with their visual cues. In addition to cultural controls, several natural enemies help suppress thrips populations. These include predatory thrips (Figure 3), green lacewing larvae, predatory mites, and minute pirate bugs (Figure 7). Natural enemies that forage at/in the soil can help suppress the pupal stages and include entomopathogenic nematodes, rove beetles (*Atheta coriaria*) and *Stratiolaelaps scimitus* (*Hypoaspis miles*) mites. Supporting these beneficial arthropods through habitat management or biological control strategies can enhance overall thrips management.

Introducing the Fourlined plant bug (Poecilocapus lineatus)

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

Last week, I had the wonderful opportunity to visit a local grower who installed an insectary strip adjacent to their high tunnel last year. They will be hosting a field day in June (Register HERE), so I wanted to take a sneak peek and see how the plants (and insects) were doing. The plants are progressing well, including wildflowers, grasses and sedges. Some were even flowering! I was surprised (and stumped) to find some necrotic leaves, especially near the growing tips, on some of the flowers. My NRCS colleagues told me the flowers were in the mint family, so when I first suspected Harlequin bugs, I was a bit confused because I know they have a strong preference for brassica plants, but can feed on others.

With my photos in hand (thank you, cell phone!) I went on the hunt to figure out what this insect was causing the necrotic tissue damage. As it turns out, this was a new one for me! It is called the Fourlined plant bug! A name that basically describes the brightly colored adult that is black with four bright green vertical lines along its back and some red near its head (Figure 1). What I saw were the nymphal (Figure 2) stages, little red 'true bugs'. This insect belongs to the Order Hemiptera, which we call the true bugs and most often have piercing-sucking mouthparts; think aphids, plant hoppers, leaf hoppers, stink bugs, etc.

Figure 1. Fourlined plant bug adult on soybean (Photo by John Obermeyer).

Figure 2. Fourlined plant bug nymph (Photo by Laura Ingwell).

The feeding damage caused by the Fourlined plant bug results in white-grey spots on the leaf surface, resembling plant pathogens such as fungal infections (Figure 3). In some cases, where heavy feeding occurs, the spots can coalesce and result in larger necrotic spots or crinkling leaves.

Figure 3. Necrotic spots caused by Fourlined plant bug feeding (Photo by Laura Ingwell).

This insect goes through egg-nymph-adult life stages. Eggs are laid on foliage in fall and overwinter. In the spring, the eggs hatch and the nymphs are present, dropping to the soil when disturbed. Adults eventually arise, after 3-6 weeks, and are winged. They will fly away when disturbed. There is only one generation per year, and the adults can be found feeding through late July.

The Fourlined plant bug has a wide host range, feeding on over 250 species of plants. They are most seen on herbaceous perennials, herbs such as mint and basil, zinnia, marigold, currants, gooseberries and peppers. This is not an insect that I often encounter in food production. If you struggle with managing this insect, I suggest sending a sample to the PPDL to confirm identification and get tailored recommendations.

New EPA Requirement for Pesticide Application

(Miranda Purcell, mrpurcel@purdue.edu)

The EPA is enacting new requirements for agricultural pesticide applicators. An increasing number of pesticide labels require applicators to utilize an online system called Bulletins Live! Two to determine if additional pesticide use limitations are required to protect threatened or endangered species or habitat based on 1) application location, 2) pesticide product, and 3) application month. This is used to limit restrictions to geographic and time-specific uses and to avoid blanket restrictions.

If the use of Bulletins Live! Two is required for a specific pesticide, it will be indicated on the label under the Environmental Hazards section. It would then be required to follow pesticide use limitations generated by Bulletins Live! Two in addition to those found on the label. The bulletins produced are documents that

describe any additional pesticide use limitations based on the proposed application details. Applicators may check Bulletins Live! Two up to 6 months in advance of the application. It is encouraged to print and/or save the bulletins along with pesticide records. Compliance is the responsibility of the applicator.

To generate a bulletin:

Step 1: Access the Bulletins Live! Two — View the Bulletins https://www.epa.gov/endangered-species/bulletins-live-two-view-bulletins

Step 2: Navigate to intended pesticide application area by using 'Location Search' tool or by zooming in on the map

Step 3: Select your application month from the dropdown

Step 4: Search specific pesticide products by entering the EPA product registration number

Step 5: Based on whether there is a Pesticide Use Limitation Area (PULA) associated with the product(s), click on the 'Printable Bulletin' button in the top right-hand corner to generate a printable bulletin in PDF format, which can be printed or saved.

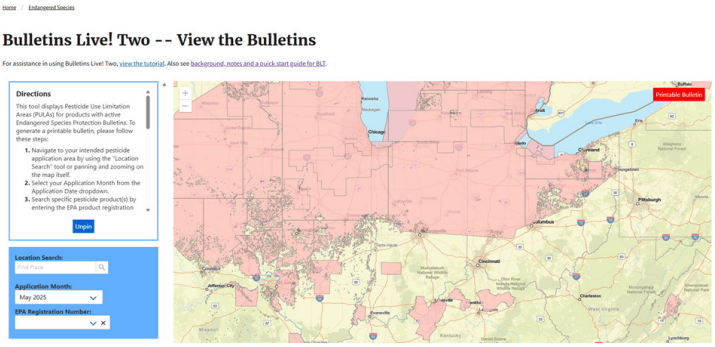
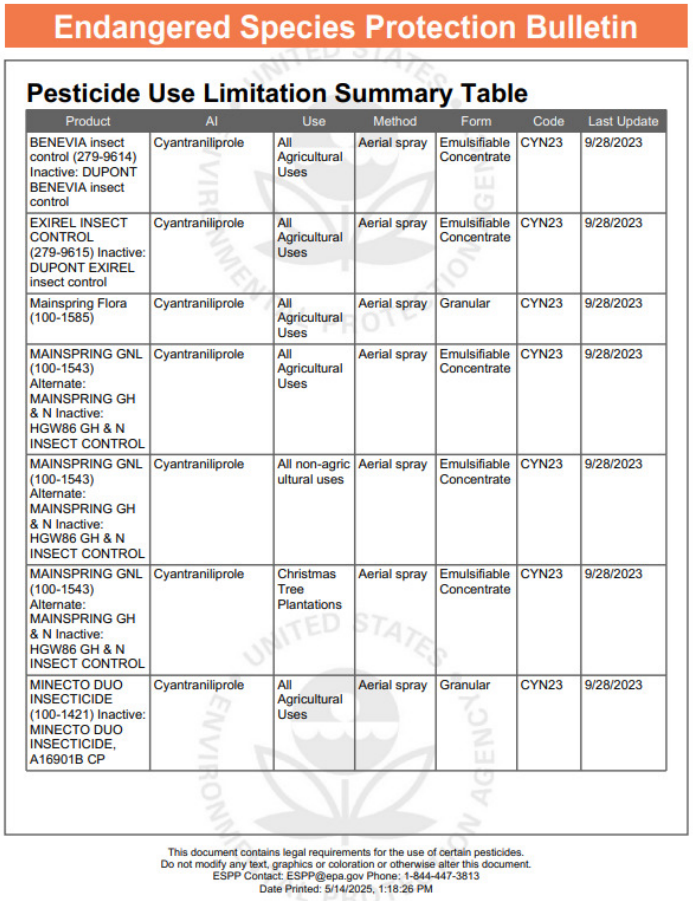


Figure 1. Bulletins Live! Two website, accessed May 14, 2025.



Product	AI	Use	Method	Form	Code	Last Update
BENEVIA insect control (279-9614) Inactive: DUPONT BENEVIA insect control	Cyantraniliprole	All Agricultural Uses	Aerial spray	Emulsifiable Concentrate	CYN23	9/28/2023
EXIREL INSECT CONTROL (279-9615) Inactive: DUPONT EXIREL insect control	Cyantraniliprole	All Agricultural Uses	Aerial spray	Emulsifiable Concentrate	CYN23	9/28/2023
Mainspring Flora (100-1585)	Cyantraniliprole	All Agricultural Uses	Aerial spray	Granular	CYN23	9/28/2023
MAINSPRING GNL (100-1543) Alternate: MAINSPRING GH & N Inactive: HGW86 GH & N INSECT CONTROL	Cyantraniliprole	All Agricultural Uses	Aerial spray	Emulsifiable Concentrate	CYN23	9/28/2023
MAINSPRING GNL (100-1543) Alternate: MAINSPRING GH & N Inactive: HGW86 GH & N INSECT CONTROL	Cyantraniliprole	All non-agricultural uses	Aerial spray	Emulsifiable Concentrate	CYN23	9/28/2023
MAINSPRING GNL (100-1543) Alternate: MAINSPRING GH & N Inactive: HGW86 GH & N INSECT CONTROL	Cyantraniliprole	Christmas Tree Plantations	Aerial spray	Emulsifiable Concentrate	CYN23	9/28/2023
MINECTO DUO INSECTICIDE (100-1421) Inactive: MINECTO DUO INSECTICIDE, A16901B CP	Cyantraniliprole	All Agricultural Uses	Aerial spray	Granular	CYN23	9/28/2023

Figure 2. Example of Bulletins Live! Two Summary Table for PULA ID: 87, accessed May 14, 2025.

Want to learn more?

Michigan State University Extension is hosting a **webinar on May 22** to provide details on the new requirements and show live demonstrations of using the Bulletins Live! Two website. There are two time slots available: **12 pm and 6 pm**. This webinar is free, but registration is required. Register here: https://www.canr.msu.edu/events/bulletins-live-two-webinar?utm_source=cc&utm_medium=email&utm_campaign=extensiondigests

Resources

EPA Bulletins Live! Two tutorial: https://www.epa.gov/endangered-species/bulletins-live-two-view-bulletins

Endangered Species Protection Bulletins: https://www.epa.gov/endangered-species/endangered-species-protection-bulletins

Fruit growers need to be aware of significant pesticide label changes: https://www.canr.msu.edu/news/fruit-growers-need-to-be-aware-of-significant-pesticide-label-changes

Southwest Purdue Agriculture Center

Field Day Set for June 26

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

The Southwest Purdue Agricultural Center (SWPAC) is one of the eight Purdue Agricultural Centers located across Indiana. What makes SWPAC unique is its location in the heart of Indiana's watermelon-growing region—home to one of the state's most significant specialty crop industries. In addition to watermelon and cantaloupe, southern Indiana is known for its diverse fruit and vegetable production, along with a strong presence of agronomic crops. As farming practices advance and industry needs change, research and Extension priorities at SWPAC continue to evolve to meet those demands.

The SWPAC Field Day offers a valuable opportunity to see these changes firsthand. It's an event for anyone passionate about agriculture and eager to learn more about how our food is produced and how production practices are adapting.

During the field day, participants will tour the research plots and hear presentations on a variety of topics, including:

- Winter canola production and market potential
- Sorghum as an alternative crop across Indiana
- Enhancing seed quality traits in cowpeas
- Using drones for pesticide application
- Pollinator health and the use of pollenizers in watermelon production
- Resilient agriculture and Purdue's initiative to implement these practices
- High tunnel tomato production and a cut flower research initiative
- Evaluation of synthetic and biological fungicides for watermelon and tomato production
- Recent updates on field crop diseases
- Changes in food safety regulations and new research projects related to food safety
- The Diverse Corn Belt project

Additionally, Dr. Fred Whitford will deliver a special presentation, "*Horsepower on the Farm: From Hay-Powered Horses to Gas-Powered Tractors*" sharing the fascinating story of how agriculture has evolved over the years.

The SWPAC Field Day is free to attend, and lunch will be provided, thanks to the support of our generous sponsors!

For more event details, please refer to the flyer. To register, visit https://tinyurl.com/2025SWPACFieldDay or call 812-886-0198

Small Farm Education Field Day Will Feature New Research, Live Demonstrations and Purdue Experts

(Olivia Noelle De Young, odeyoung@purdue.edu), (Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955) & (Lori Jolly-Brown, ljollybr@purdue.edu)

The Purdue Small Farm Education Field Day, scheduled for July 24, 2025, will feature demonstrations and presentations designed to support small-scale farming.

The Department of Horticulture and Landscape Architecture will co-host the event with the Purdue Student Farm. Attendees can learn from Purdue University and Purdue Extension experts about

topics such as small-scale farming hacks, container farming (hydroponics), raised garden beds for vegetables, sweet pepper production, equipment demonstrations, food safety in packinghouses, and pest monitoring using pheromone traps.

“This field day creates a vibrant hub where small farm operators and urban growers from across Indiana converge. Its thoughtfully designed structure provides meaningful opportunities for exchanging practical knowledge and building valuable relationships,” said Petrus Langenhoven, Purdue Student Farm director. “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.”

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

Attendee registration costs $40 and can be completed here. Students and Extension educators can register at a discounted rate. Registration information will be available at Purdue Small Farm Education Field Day.

The event will run from 8 a.m. to 2 p.m. at the Purdue Student Farm, located at 1491 Cherry Lane, West Lafayette, Indiana. Lunch is not included, but each attendee can receive a free Kona ice cup, and a food truck will be on site.

Program details are being finalized and will be available soon.

If you have questions, do not hesitate to contact Lori Jolly-Brown at 765-494-1296 or ljollybr@purdue.edu

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

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