PURDUE UNIVERSITY

FACTS FOR FANCY FRUIT

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A Newsletter for Commercial and Advanced Amateur fruit growers.

In This Issue

Crop conditions

(Wil Brown-Grimm, wbrowngr@purdue.edu)

Hello! This is our third crop conditions update this season. The fruit trees are progressing well as things get up and going around the farm. Most everything has passed 1 or more stages of growth since the third week of this month. Monday the 28th marked our first fungicide application in the vineyard, with the majority of our diverse grape varieties reaching the 1-3 in shoot stage. The orchard was sprayed for fireblight on the 22nd. I'm hopeful we've seen the last of the hard frosts this season and that we may get a good peach crop!

Strawberries: Bloom

Pawpaw: Bloom

Plum: Fruit set

Peach: Petal fall/ fruit set

Apple (Rosalee): Bloom

Pear: Petal fall

Grapes: 1-3in shoots

Apple (Pixie Crunch): Petal fall

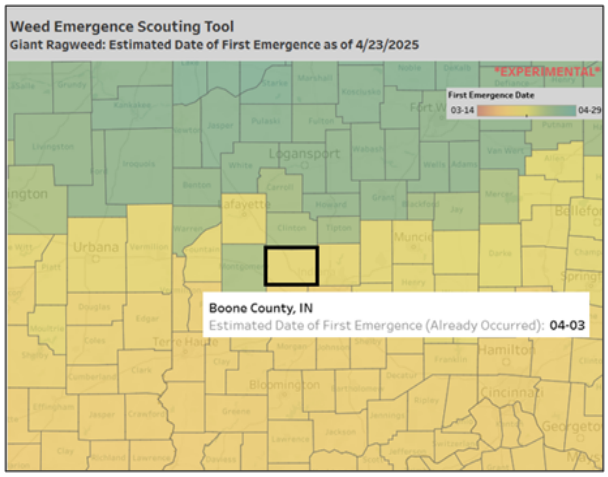
Black Currant: Bloom

Blackberry: Pre-bloom

Midwestern Regional Climate Center Launches New Experimental Weed Emergence Scouting Tool

(Austin Pearson, pearsona@purdue.edu)

Midwestern farmers have faced a buildup of pesticide resistance in pigweeds (waterhemp and Palmer amaranth), highlighting the importance of scouting to detect weeds early in their growth stages. Otherwise, weed escapes are a common issue as herbicides lose their efficacy when weeds are allowed to grow long enough into their growth cycle. The **Midwestern Regional Climate Center (MRCC)**, supported by the **USDA National Institute of Food and Agriculture, Crop Protection and Pest Management Program** through the **North Central IPM Center** (2022-70006-38001), has developed the experimental **Weed Emergence Scouting Tool (W.E.S.T.)** to help farmers estimate when agronomic weeds are likely first to emerge and reach peak emergence based on growing degree day (GDD) models. The tool is currently limited to two weeds: waterhemp and giant ragweed. The MRCC hopes to expand its focus to other weeds with future funding.



The current version allows users to:

- Track GDD (base 48°F) accumulations over the current year (January 1 to the current date) for any Midwest County.
- Based on forecast data, determine whether giant ragweed or water hemp is expected to reach its peak emergence within six days and, if so, in how many days.
    - Giant ragweed first emerges at about 120 GDD (base 48°F) and reaches peak emergence between 200 and 300 GDD.

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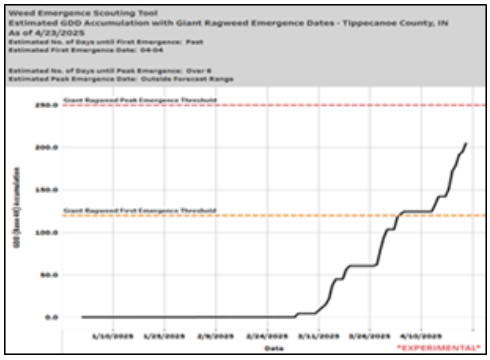
- Waterhemp first emerges at about 425 GDD (base 48°F) and peaks between 500 and 600 GDD.Waterhemp first emerges at about 425 GDD (base 48°F) and peaks between 500 and 600 GDD.Review the current season's emergence dates for giant ragweed or water hemp in specific Midwest counties.



W.E.S.T. uses high-resolution PRISM temperature data to calculate GDDs with a base of 48°F and adds them to the previous day's total. Forecast maximum, minimum, and average temperatures from NOAA are adjusted to the county level and are then used to calculate daily GDD accumulations over the subsequent six-day period. Research from Iowa State University indicates that giant ragweed typically emerges with fewer than 150 GDD, while waterhemp requires more than 350 GDD. To refine these estimates, Purdue Extension Educators collected field data across Indiana in 2023. Findings include:

This tool would benefit from your giant ragweed and waterhemp observations to better refine this product. Email **mrcc@purdue.edu** if you want to provide weed emergence observations to assist in tool validation and refinement

Interested in Planting

Brambles?

(Miranda Purcell, mrpurcel@purdue.edu)

Interested in planting brambles? Here's what you need to know!

What are brambles?

Bramble crops are from the genus *Rubus* and include blackberries and raspberries. Brambles are among the easiest fruit crops to grow, and the fruit is in high demand due to its exotic flavor and high nutritional value. Brambles can be planted in the home garden, incorporated into a vegetable farm or grown for u-pick.

Basics

Brambles have perennial root systems and biennial shoot growth (shoots live for 2 years). Brambles require full to partial sunlight and adequate water with good soil drainage to prevent wet feet. The ideal soil is sandy loam with a pH of 6.0-6.5. The desirable range of important nutrients is as follows: Nitrogen (foliar): 2.0-2.8%, Phosphorus: 20-30 ppm and Potassium: 120-180 ppm. Different types of raspberries include red, black, yellow, and purple varieties. Blackberries are categorized by their growing habit (erect, semi-erect, or trailing) and whether or not they have thorns.

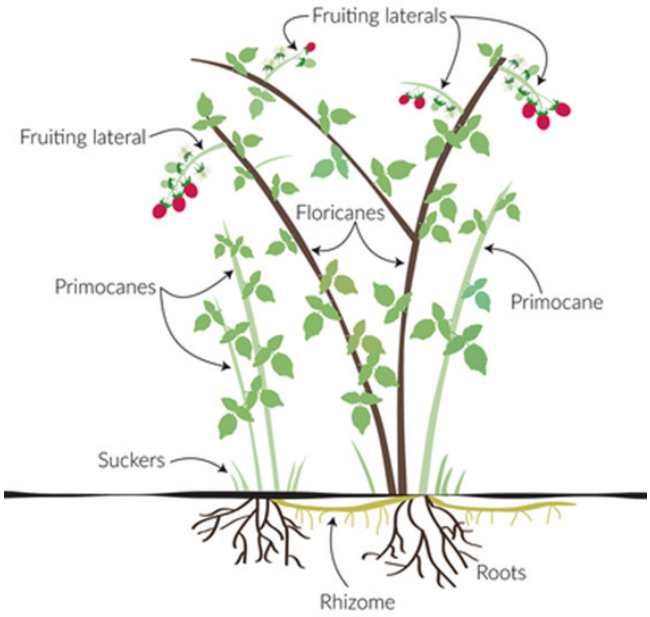


Figure 1. Primocanes (1-year-old shoots) and floricanes (2-year-old shoots) on raspberry plant. Photo from the University of Minnesota Extension.

Raspberries

Raspberries produce fruit on 2-year-old canes (floricanes). Each year, raspberries produce new shoots (called primocanes), which do not flower or produce fruit until year 2 (when they are floricanes). However, some red raspberry varieties are known as ever-bearing or primocane fruiting types, and they produce a crop in the late summer on floricanes and a second crop in the fall on primocanes. Remove bearing canes (floricanes) each year after harvest. Remove weak, diseased, or damaged canes in early spring. Black raspberries require tip pruning in the summer to encourage branching.

Raspberries are cold hardy, with most varieties well-suited to the Midwest. Red raspberries are the hardiest, although late Spring freeze damage can still occur, especially with extreme temperature fluctuations. Purchase certified virus-free plants and plant in the Spring. Expected productivity is 5-8 years. Raspberries are self-fertile, and the yield is typically 1-1.5 quarts per plant.

Blackberries

Blackberries can produce fruit on 1-year-old wood (primocane-fruiting types) or 2-year-old wood (floricane-fruiting types). Remove bearing canes (floricanes) after harvest each year. Tip pruning in summer is required to encourage branching. Remove weak, diseased, or damaged canes and shorten lateral branches in early spring. For easy management, trellis semi-erect varieties . For primocane-fruiting types, cut canes to the ground in the Fall after frost. New primocanes will grow in Spring (canes will grow, flower, and fruit in one season).

Most blackberries can only withstand -10°F, although new primocane fruiting varieties are slightly more cold hardy. Blackberries are most well-suited to Southern Indiana but can be planted in Northern Indiana with careful site and variety selection. Blackberries are self-fertile. Yield varies from 1 quart per 1-2 row feet for thornless erect types, 1-2 quarts per 1-row foot for thornless erect types, and 4-8 quarts per plant for thornless semi-erect types.

Figure 2. Simple trellis for blackberries with floricanes tied to the frame and primocanes growing up in the middle. Photo from Bruce Bordelon.

Other Considerations

When deciding whether brambles are compatible with their overall operation, growers must consider land, labor, capital, equipment use, time commitment, seasonality, and management skills. Bramble production requires a high initial investment, and slow returns are expected at first. Regarding labor, brambles can be an ideal crop for both small and large farms. However, large farming operations may require additional labor during pruning and harvest. Brambles ripen in late summer and may be ideal for a farm that grows and markets early-to-mid-summer maturing vegetables.

Space availability will determine plant type. Red

raspberry plants should be spaced 2 ½ to 3 feet apart, and purple and black raspberries should be spaced 3 to 4 feet apart. Blackberry bushes should be planted 4-6 feet apart (closer spacing for erect and semi-erect types, wider spacing for trailing types). The distance between rows will depend on equipment, but typically ranges from 6 to 12 feet.

Avoid planting brambles where tomatoes, potatoes, eggplant, strawberries, or other crops susceptible to Verticilium wilt have been grown in the previous 4-5 years because the fungus that causes Verticilium wilt can remain in the soil for several years. Also, only plant brambles after field crops if there is no history of using herbicides with long residual activity.

Varieties for Indiana

Blackberries

- Erect Thornless: Ponca, Osage, Apache, Ouachita, Natchez, Arapaho
- Semi-erect Thornless: Triple Crown, Chester
- Thorny: Shawnee
- Primocane-fruiting: PrimeArk45, Black Magic, Freedom, Traveler

Raspberries

- Black Raspberries: MacBlack, Jewel, Bristol, Niwot (primocane-fruiting)
- Red Raspberries-
    - Summer: Nova, Titan, Prelude
    - Fall: Heritage, Autumn Bliss, Caroline

Additional Resources:

Raspberries | Purdue Extension HO-44
Blackberry Production Systems in Ohio
Small Fruit Cold Hardiness – Winter Injury in Brambles
UMass Small Fruit Management Guide – Brambles
Midwest Fruit Pest Management Guide

‘J’ Rooting of Bare-root Strawberry Plants

(Wenjing Guan, guan40@purdue.edu)

Bare-root strawberry plants often arrive with roots that are 6 to 10 inches long. For optimal planting, the roots should be kept straight, which requires digging a deep hole or using specialized tools. If the planting hole is too shallow, the roots may bend and form what is known as a ‘J-root’.

You may have heard experienced growers say, ‘Never plant bare-root strawberries with J-root’. But the reason why isn’t always obvious. To better understand the issue, we did an experiment by planting bare-root strawberry plants in pots, some with straight roots and others with J-roots, and observed the differences.

Both sets of plants grew well in the greenhouse, and I couldn’t see any noticeable difference in their aboveground growth. However, when I removed the plants from the pots to examine their root systems, I found a clue that may explain why J-rooting can be a problem.

The plants in the photo were grown in 6-inch pots for about three weeks in a greenhouse. The ones on the left were planted with J-roots, while those on the right had straight roots. During the three-week growth period, most of the new roots developed from the lower end of the original roots. These new roots are fine and thin, but there are a lot of them. The arrow in the photo pointed to the new roots.

When bare-root plants are planted with straight roots, the new roots develop several inches below the soil surface. But when the original roots are curled during planting, the tips end up near the soil surface, and the new fine roots also grow close to the soil surface.

We also observed a few thicker roots emerging from the crown, with no apparent difference between the two planting methods. This is not surprising, as crown root development is influenced by the depth at which the crown is buried, a factor that did not different between the treatments in this study. Although we did not monitor root growth over time, there appeared to be a trend in which initial root development occurred primarily along the old roots, particularly on the lower half of the root system, followed by the emergence of new roots from the crown.

Does the initial root growth pattern matter for plant survival and growth? A study conducted in Florida compared bare-root strawberries planted with J-roots and straight roots on plastic-mulched beds. The plants were irrigated intensively for 10 days after transplanting. Researchers found no significant differences in plant establishment, growth, or yield between the two planting methods. They concluded that when proper irrigation practices are followed, the way roots are positioned during planting may not be critical. You can find more details about that study here. Similarly, in my greenhouse experiment using soilless substrate in pots and watered daily, J-rooting at planting did not seem to affect plant survival or above-ground plant growth.

However, understanding the differences in initial root growth between J-rooted and straight-rooted plants can help explain why planting technique matters under less-than-ideal conditions. When soil moisture varies widely after transplanting, bare-root strawberries planted with straight roots are more likely to survive. That's because their newly developed roots are located deeper in the soil, where moisture levels are more stable compared to the surface.

Special thanks to Indiana Berry for donating the bare-root plants and encouraging us to explore this topic.

Observations on the Companion Plant: Sweet Alyssum

(Robert Grosdidier, rgrosdid@purdue.edu) & *(Laura Ingwell, lingwell@purdue.edu)*

Spring is in full swing in our research high tunnels at Purdue. Overwintering strawberries that we planted in September are now in full bloom and fruits are being harvested. But as temperatures increase and crops become more productive, we also see the emergence of various insect pests. Aphids, amongst other soft-bodied insect pests (e.g., whiteflies, mites, and thrips), are the primary culprit on the strawberries and spinach we grow in the high tunnels. The damage caused by these pests can lead to significant yield losses that may offset the economic benefits of growing food for early-season markets. Luckily, as these

pests emerge, so do their natural enemies – predacious arthropods and parasitoid wasps! Promoting these insects in high tunnels can provide natural and targeted pest suppression services, thus eliminating the need for chemical sprays or augmentative biological control and reducing crop damage overall. The question becomes, how do we promote these organisms in our high tunnels?

One way is to incorporate insectary plants, like sweet alyssum. Sweet alyssum is a plant in the mustard family (Brassicaceae) characterized by its small white flowers and its pungent, sweet aroma (Figure 1). It is considered an insectary plant because its aroma is alluring to a variety of beneficial insects. Predators and parasitoids depend on their prey as a source of protein, but require carbohydrates in the form of plant nectar to fuel them as they search for their next victim. The smell of sweet alyssum flowers tells these insects that there is plenty of nectar to be had. In our research tunnels, we planted sweet alyssum in half of our high tunnels (see Figure 2) and observed a very promising phenomenon. Strawberries planted alongside sweet alyssum had almost no aphids on them; meanwhile, strawberries planted alone had higher aphid pressure. While we can't definitively tie the reduced aphid abundance to the sweet alyssum, sticky card traps that we deployed have shown that parasitoid wasps and syrphid flies are in increased abundance where sweet alyssum is present. These insects are likely driving the reduction in aphid pressure.

In addition to pest suppression, the sweet alyssum may indirectly increase fruit set in strawberries by increasing the number of pollinators present. This early in the year, bees are only beginning to emerge and are less inclined to enter high tunnels compared to other insects. However, our sticky card traps have shown us that sweet alyssum draws in many types of flies. Flies aren't the typical image you think of when considering pollinators, but they are, in fact, the second most important pollinators behind bees. Flies are especially important pollinators of strawberries. For early-season fruit production in high tunnels, flies are likely doing the bulk of the pollination. Planting sweet alyssum can increase fly abundance in the tunnels, thus theoretically increasing fruit set!

We encourage growers to experiment with growing sweet alyssum, as well as other insectary or companion plants, on your own farm! These plantings are a low-cost, low-maintenance method of increasing pest suppression and pollination services. Additionally, they will make your farm a more beautiful, aromatic, and biodiverse system.

Figure 1. Flowers of sweet alyssum. Photo by Robert Grosdidier.

Figure 2. Sweet alyssum being grown alongside strawberries in research high tunnels at the Purdue Meigs Horticultural Farm. Notice the yellow sticky card trap with a high abundance of flies and other insects present. Photo by Robert Grosdidier.

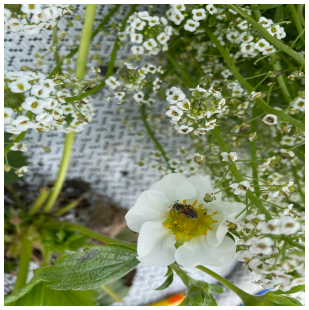


Fig 3: Halictid bee on strawberry flower

Fig 4: Syrphid fly on sweet alyssum flowers.

Veterans Grapevine Planting Workshop

(Miranda Purcell, mrpurcel@purdue.edu)

Join Veterans in Farming and Purdue University for a Grape Planting Workshop followed by a wine tasting on June 3rd at The Rejoicing Vine Winery in Indianapolis, IN.

Come see what it takes to cultivate grapes and operate a winery! Learn from Purdue viticulture specialist Miranda Purcell all about grape planting and growing techniques for prosperous vines!

Get your hands dirty as we plant vines in the beautiful space setup at The Rejoicing Vine in Indianapolis. Learn about the history of Indiana wine and grape production and best growing practices. Then stay for a specialty wine and cheese tasting to follow! With wine from onsite and local cheese sourced from Tulip Tree Creamery.

Register to secure your spot today!

Need directions? Accessibility or other questions? Contact Chris at christina@ateaseorchard.com, (765) 621-2924

Southwest Purdue Agriculture Center Field Day Set for June 26

(Wenjing Guan, guan40@purdue.edu)

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

Upcoming Events

(Miranda Purcell, mrpurcel@purdue.edu)

Veterans Grape Planting Workshop

Tuesday, June 3rd

The Rejoicing Vine Winery Indianapolis, IN

https://vetsinfarming.wildapricot.org/event-6136107

Indiana Horticulture Society Field Day

Wednesday, July 9th

Chandler's Orchard & Country Market Fillmore, Indiana

Purdue Small Farm Education Field Day

Thursday, July 24th

Purdue Student Farm West Lafayette, IN

https://ag.purdue.edu/events/department/hla/2025/07/purdue-small-farm-education-field-day.html

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