
In This Issue



# From The Editor's Desk

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

Dear Valued VCH Readers,

Welcome to the first edition of the 2025 Vegetable Crops Hotline newsletter! As we begin this new growing season, I'm excited to continue our tradition of providing timely, research-based information to support Indiana's vegetable-growing community. Our mission remains steadfast: to deliver crucial updates on pest management, production practices, food safety, and marketing opportunities that directly impact your farming operations.

In the coming issues, we'll cover several critical topics, including emerging pest challenges, innovative irrigation management strategies, the latest developments in high tunnel production, and much more. We'll also feature updates on food safety regulations affecting our vegetable industry.

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.

## Subscription Information

### Hard Copy Subscribers

A hard copy of the first 2025 issue is sent to all who subscribed to VCH via US-mail in 2024 and all new subscribers for 2025. To continue receiving future copies through US-mail, 2024 subscribers must renew their Hotline subscriptions using the form enclosed in your envelope. Don't know which year you subscribed for? Check the envelope you receive this newsletter in. The year that your subscription is paid through is at the bottom right-hand corner of your envelope.

If you need a hard copy subscription form and don't have access to the internet, please contact your nearest Purdue Extension office. Extension Educators, please download the hard-copy subscription form at HERE.

### Digital Subscribers

If you receive the newsletter via email, you do not need to take any action. You will continue to receive the newsletter on the issue date.

New digital subscribers can register their email address HERE

In addition, digital subscribers receive emails with information about articles or announcements that need your immediate attention. These articles will be posted under Hot Topics on the VCH webpage and will be included in the next issue. All previous articles published in the VCH newsletter are available on the VCH website (https://vegcropshotline.org/).

## Website Links in Newsletter Articles

Frequently, we include links to websites or publications available online. If you can't access these resources, 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 a 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 Report features many articles to help you make an informed decision. The resource also hosts production-related research results.

Here's to a productive and prosperous growing season ahead!

Best regards,

Petrus Langenhoven
Clinical Assistant Professor and Vegetable Extension Specialist
Department of Horticulture and Landscape Architecture
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# Indiana Small Farms Conference – March 4-5, 2025

*(Amy Thompson, afthompson@purdue.edu)*


Since 2013, the Indiana Small Farm Conference has been the premier annual event for Indiana's small and diversified farm community – helping them experience continuing education and enjoy farmer-to-farmer networking.

The Indiana Small Farm Conference is the annual educational and farmer-to-farmer networking event for the Indiana small and diversified farm community. It was developed in response to a gathering of Indiana small farmers and stakeholders at the Purdue University campus in the fall of 2011. The Purdue Small Farm team hosted the inaugural conference in 2013 and has had continued success thanks to the support of Indiana farmers and organizations. The conference now hosts over 500 attendees, 50 exhibitors, and several national speakers.

We look forward to continuing to build this growing conference in partnership with Indiana's small and diversified farm community!

The conference program is available HERE

Register now!

## Contact Us

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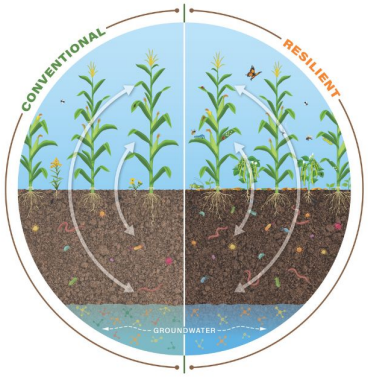
# Purdue University to Host Inaugural Resilient Agriculture Summit

*(Devyn Raver, draver@purdue.edu)*




College of Agriculture Press Release – February 13, 2025

Whether it's called sustainable, regenerative or resilient agriculture, farmers across Indiana are exploring how to be effective stewards of the land while meeting food demands for the growing global population. Exploring these ideas, Purdue University's College of Agriculture, in partnership with the Indiana Corn Marketing Council and the Indiana Soybean Alliance, will host their first-ever Resilient Agriculture Summit on March 13. The summit will take place from 9 a.m. to 3:30 p.m. ET at the Beck Agricultural Center, 4550 U.S. Route 52, West Lafayette, Indiana.

This free, one-day event will offer networking and learning opportunities. Attendees will gain insights into the latest advancements in resilient agriculture, discover effective practices and learn how to implement these strategies into their own operations to improve environmental sustainability and farm productivity. Additionally, participants will be asked to share questions that Purdue applied research can address going forward.

"We're excited to host the inaugural Resilient Agriculture Summit. Purdue is bringing industry experts, researchers and farmers together to open new and different conversations," said Christian Krupke, Dean's Fellow for Resilient Agriculture and professor in Purdue University's Department of Entomology.

The summit will feature individuals involved with the purchasing of corn, soybeans and other crops, as well as farmers, industry experts and Purdue University representatives and researchers from different disciplines, providing a comprehensive overview of how regenerative practices are transforming agriculture. During the morning session, attendees will hear from speakers, while the afternoon will be dedicated to participants asking questions and sharing their thoughts on future research needs.

Event speakers are:

- Caitlin Colegrove, North America's sustainable agriculture lead at PepsiCo, will share insights on the company's sustainability initiatives and long-term plans.
- Janelle Leach, conservation agronomist team lead at

Cargill, will present on the perspectives and priorities of regenerative agriculture and carbon credit.
- Linda Prokopy, professor and head of Purdue's Department of Horticulture and Landscape Architecture, will provide an update on the Corn Belt's diverse agricultural landscape.
- Barry Fisher, president of Fisher Soil Health LLC, will offer guidance on the dos and don'ts of soil health management.
- Rodney Rulon, Purdue University College of Agriculture alumnus and owner of Rulon Farm, will discuss his hands-on experience with regenerative agriculture, his personal successes and the economic realities of implementing sustainable practices into farming operations.

"Some of these challenges in agriculture — feeding the future population, safeguarding our soil and land, and addressing climate change — require changes in our practices. To implement change, it doesn't make sense to have any group working in isolation," Krupke said.

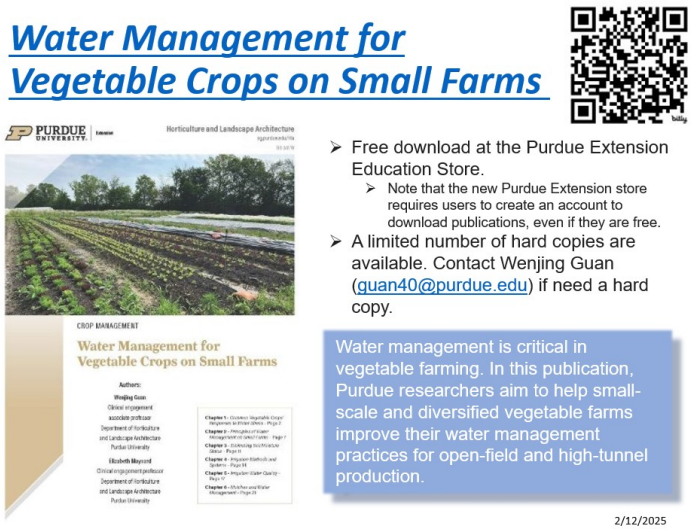
In addition to an engaging lineup of speakers, attendees will enjoy a complimentary lunch provided by The Juniper Spoon. For those needing recertifications, private applicator recertification permits and continuing education unit credits will be available.

While the Resilient Ag Summit is free to attend, registration is required and will close at 5 p.m. ET March 1. To register, visit the event's webpage. Contact Krupke with registration questions at ckrupke@purdue.edu.

## Water Management for Vegetable Crops on Small Farms

*(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)* & *(Liz Maynard, emaynard@purdue.edu, (219) 548-3674)*

We want to bring your attention to our team's new Extension publication, ***Water Management for Vegetable Crops on Small Farms***. This publication is available free of charge at the Purdue Extension Education Store.




## Want Fewer Spider Mites? Ease Up on the Beetle Spraying!

*(Zeus Mateos, zmateosf@purdue.edu)* & *(Ian Kaplan, ikaplan@purdue.edu)*

Growing watermelons in Indiana isn't always easy if you have cucumber beetles and spider mites. These pests are some of the most damaging to Midwest cucurbits and are commonly managed with a combination of insecticides and miticides. Unfortunately, chemical management for one pest could interfere with control of another pest. For example, spider mite outbreaks have been historically associated with the use of broad-spectrum insecticides like pyrethroids and neonicotinoids. This suggests that aggressive cucumber beetle management could be indirectly triggering spider mite outbreaks, but this relationship has not previously been tested.

Indiana melon growers also extensively use grass cover crops, such as cereal rye, to act as a windbreak and protect seedlings from sand-blasting damage. However, during conversations with cucurbit growers, we repeatedly heard anecdotal reports that spider mite outbreaks are caused by rye strips in their fields. The idea is that spider mites use it as a "green bridge" to build up large early-season populations that then colonize the crop starting in July. Rye is seeded in the fall, interspersed with watermelon rows (typically at a ratio of 3 watermelon rows: 1 rye row), placing it in close proximity to the crop where spider mites can rapidly colonize. However, to our knowledge, no one has ever experimentally tested the impact of rye use on spider mite densities in cucurbits.

To test the combined impacts of insecticide use and rye cover crop on spider mites in watermelon, we conducted a trial in 2023 at one Purdue Agricultural Center (TPAC) and then repeated this trial in 2024 at three PACs across Indiana (TPAC, SWPAC and SEPAC). We compared two insecticide programs: 1) a standard insecticide program and 2) an integrated pest management (IPM) program that followed economic threshold-based recommendations. The standard program consisted of an initial imidacloprid application at planting (same active ingredient used in Admire Pro) followed every 2 weeks by foliar pyrethroid applications (same active ingredient used in products like Pounce or Warrior II). In the threshold IPM program, we applied acetamiprid (e.g., Assail) when beetles exceeded a threshold density of five per plant. However, that only happened once in 2023, while no insecticides were needed in 2024. The use of rye cover crop had two levels: present or absent. The combination of insecticide and rye resulted in four treatments:

1. standard insecticide + rye presence
2. standard insecticide + rye absence
3. threshold insecticide + rye presence
4. threshold insecticide + rye absence

We randomly allocated each treatment to plots and replicated them five times per year-site (Figure 1), resulting in 20 plot replicates for each of the four treatments.

Figure 1. Example of one plot (July 2024, SWPAC) including the 20 plots. We highlighted two plots (dashed polygons), one with rye absent (left in blue) and another with rye present (right in yellow) (Photo by Zeus Mateos ).

We released ~1,600 spider mites per plot 3-4 times to ensure high infestation levels (Figure 2). We then visually scouted all plots weekly from planting to harvest, counting cucumber beetles and natural enemies per plant, and spider mites per leaf due to their smaller size. We kept track of natural enemies since insecticide-induced spider mite outbreaks are thought to be caused by disrupting their natural control by beneficial insects such as ladybugs.

Figure 2. We evenly distributed and placed infested bean leaves in direct contact with the watermelon leaves (June 2024) (Photo by Zeus Mateos).

Among the natural enemies, spiders were the most abundant group at 50% of observations, followed by ladybugs (21%) and lacewings (13%). Both pests (Figures 3A, B) and natural enemies (Figure 3C) were affected by the insecticide programs but not by the presence of rye (Figure 4). Cucumber beetles and natural enemies were more abundant in the threshold IPM program, while spider mites were more often found in the standard insecticide program. The presence of rye did not affect either pests or natural enemies.


Figure 3A. Striped cucumber beetles on a watermelon leaf with a close-up of a beetle on a flower (Photo by Zeus Mateos).


Figure 3B. Watermelon plants infested with spider mites, with a close-up of spider mites on a leaf (Photo by Zeus Mateos).


Figure 3C. natural enemies, including a spider (top left), a ladybug (bottom left) and a lacewing larva feeding on an aphid (right) (Photo by Zeus Mateos).

These data strongly implicate broad-spectrum insecticide use targeting cucumber beetles is triggering spider mite outbreaks in watermelon fields (Figure 4). Thus, in fields with a history of spider mite problems, growers should limit insecticide

applications and prioritize reduced-risk insecticides that avoid disrupting the beneficial insect community. This is a particularly important consideration given grower-reported cases of miticide resistance developing in recent years for Indiana spider mite populations.

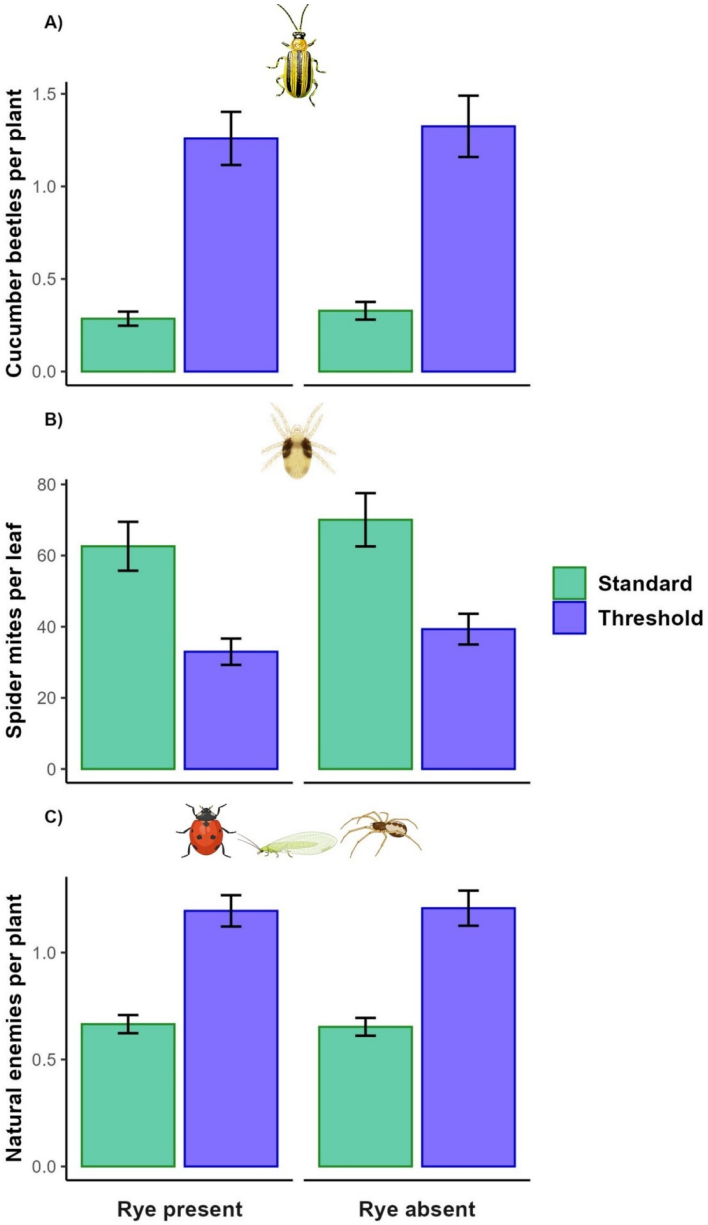



Figure 4. Mean numbers of A) cucumber beetles per plant B) spider mites per leaf C) and natural enemies per plant according to insecticide (standard vs. threshold) and rye cover crop (presence vs. absence).

Importantly, our results also show that spider mites do not seem to use rye as a bridge to move into the crop. Even though we infested the rye, we never observed spider mites reproducing there, suggesting that it may not be a preferable host plant for this pest. We also observed the same outcome when trying to artificially inoculate rye plants with spider mites in the lab (i.e., establishment and reproduction were always low).

Overall, our results emphasize the importance of adopting IPM to manage primary pests, minimize secondary pest outbreaks, and protect natural enemies and other beneficial insects by providing free ecosystem services such as biocontrol and pollination.

We want to thank PAC managers Chloe Richard (TPAC), Dennis Nowaskie (SWPAC), Joel Wahlman (SEPAC), and their crews for setting and managing the plots and the techs, staff, and students who helped collect data and harvest.

## Strawberry Chat Podcast — Interview with Sam Erwin, Indiana Berry Company

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

In this episode, we speak with Sam Erwin, owner of Indiana Berry Company, a leading supplier of bare-root strawberries, blueberries, blackberries, asparagus, and more. It is fascinating to hear Sam talk about the company's history and the fruit industry in Indiana, as well as his version and advice for the new generation of fruit growers. We will also dive into how bare-root strawberry plants are produced at Indiana Berry and hear Sam share his thoughts on the different strawberry production systems.

You can hear this discussion and previous chats on the Strawberry Chat Podcast.

## How Much Warmth Row Covers Provide at Extreme Cold Nights?

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

This week, we experienced another round of very cold days, with minimum temperatures dropping into the single digits. Under these conditions, row covers are essential for helping plants survive and preventing cold damage even inside high tunnels.

The difference in the minimum temperatures inside and outside of high tunnels may not always be significant, as it depends on the tunnel's insulation capability. However, using row covers inside a high tunnel can create a notable temperature increase.

There have been questions about how much warmth row covers can provide when used inside a high tunnel. To address this, we compared temperatures in two beds inside a high tunnel—one covered with a 1.5 oz/sq.yd (Agribon AG-50) row cover placed on a wire hoop, and the other left uncovered—over two winters at the Southwest Purdue Agricultural Center.

Our findings showed a strong negative correlation between the minimum temperature in the high tunnel and the temperature increase provided by the row covers. In other words, the colder the conditions inside the high tunnel, the greater the row cover's warming effect.

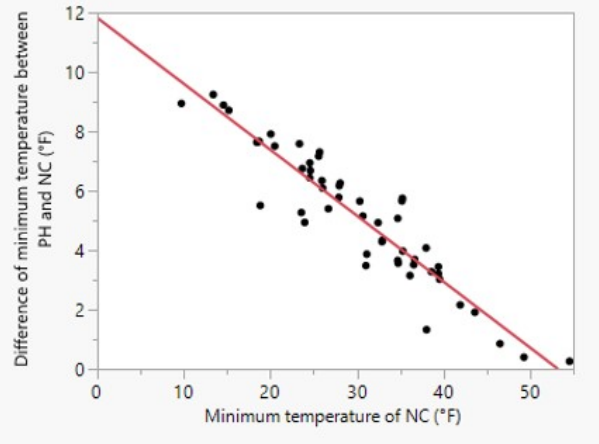



Figure 1. Effect of row covers on temperature increase (y-axis) vs. minimum temperatures inside the high tunnel (x-axis) in 2022-2023 winter at the Southwest Purdue Agricultural Center [PH = passive cover (covered entire winter) on hoops; NC = no cover].

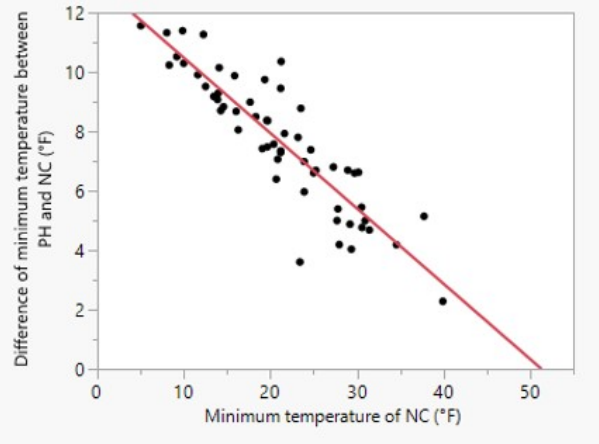



Figure 2. Effect of row covers on temperature increase (y-axis) vs. minimum temperatures inside the high tunnel (x-axis) in the 2021-2022 winter at the Southwest Purdue Agricultural Center [PH = passive cover (covered entire winter) on hoops; NC = no cover].

For example, when the minimum temperature inside the high tunnel was near 0°F, the row cover increased temperatures by approximately 12°F. However, when the minimum temperature inside the high tunnel was around 50°F, the row cover had little to no effect on raising the temperature.

The varying effects of row covers in raising minimum temperatures are likely influenced by the amount of heat stored in the soil. Across Indiana, soil temperatures at a depth of 4–6 inches typically range between 40°F and 50°F during the winter. When air temperatures are similar to soil temperatures, row covers have little effect on increasing air temperatures at night.

When used inside high tunnels, row covers clearly provide significant protection on extremely cold nights. However, this protection may not be sufficient for less cold-hardy crops like lettuce, which could suffer damage when temperatures drop to 28°F. Successfully growing these crops in winter typically requires supplemental heating or a specifically designed structure.

# Application of GMPs for the Cottage Food Industry: Learnings From the Consumer Food Safety Education Webinar Series

*(Suyapa F. Rojas, srojasor@purdue.edu)* & *(Yaohua (Betty) Feng, yfengchi@purdue.edu)*

The Summer School for Consumer Food Safety Education is an annual program that conducts continual consumer food safety training for educators and extension volunteers through expert-led presentations. This program serves as a platform to convey updated research information on current trending consumer food safety topics and helps participants gain a better understanding of the food safety implications of various types of foods.

The 2024 speakers of the first webinar session were Nicole Richard, a food safety specialist from the University of Rhode Island, and Amanda Kinchla, an extension associate professor from the University of Massachusetts, Amherst. They focused their presentation on the application of good manufacturing practices (GMPs) for the cottage food industry.

Cottage food industry businesses must follow GMPs to minimize the risk of contamination, whether operating in a home kitchen or at a manufacturing facility. GMPs place emphasis on personal hygiene, cleaning and sanitization, equipment handling and proper storage, and distribution. In the first webinar session, Nicole Richard highlighted the importance of proper handling of food-contact surfaces and utensils to avoid microbial, chemical, and physical hazards. Maintaining a clean environment and following detailed sanitization procedures are critical steps to prevent contamination. Additionally, cottage food processors must follow GMP guidelines when receiving raw materials or ingredients and in monitoring food processing parameters to keep food safe.

Amanda Kinchla explained the regulations applicable to the cottage food industry, emphasizing the importance of food safety plans and the need to understand applicable food safety regulations that state regulatory public health agencies as well as the FDA and USDA decree. The Food Safety Modernization Act (FSMA) and Hazard Analysis and Critical Control Points (HACCP) are additional regulations necessary for hazard analysis and preventive controls. Kinchla also introduced resources and training opportunities available to small food processors and focused on the importance of staying informed about regulatory changes and safety requirements pertinent to the cottage food industry.

You can watch this session and previous webinars on the Food Safety Human Factor Lab Website.

# Passive Solar Greenhouses

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

Passive solar greenhouses are widely used in northern China to grow crops year-round without supplemental heating. My former mentor introduced me to a project by the University of Missouri Extension, where they built a passive solar greenhouse. This past winter, I had the chance to meet Tim Reinbott at a conference and learned that his team recently published a series of videos explaining their passive solar greenhouse and potential improvements. I found these resources fascinating and wanted to share them with Indiana growers.

**Video 1. How to build a solar greenhouse**

**Video 2. How to build a solar greenhouse – What I would have done differently**

In addition, I'd like to share some observations from my visit to China a few years ago. I saw several passive solar greenhouses in a region with a latitude similar to Indiana's. These structures varied in design, with some incorporating more modern technologies than others. Below are a few pictures, along with my notes.

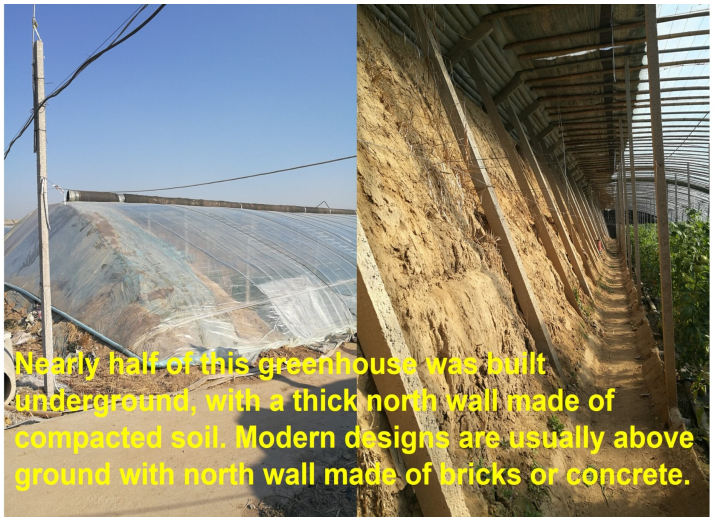



Figure 1. Passive solar greenhouse north wall (Photo by Wenjing Guan).


Figure 2. Passive solar greenhouse insulation mat (Photo by Wenjing Guan).


Figure 3. Passive solar greenhouse ventilation (Photo by Wenjing Guan).

# Expanding Precipitation Observations in Indiana

*(Austin Pearson, pearsona@purdue.edu, (765) 675-1177), (Beth Hall, hall556@purdue.edu) & (Jacob Dolinger, jdolinge@purdue.edu)*

How often have you heard that your neighbor received rain while you missed it? Precipitation is highly variable and has significant impacts on communities. Insufficient rainfall can cause drought and water supply issues, while excessive rain can lead to flooding and damage to infrastructure. The dense precipitation measurements provided by the Community Collaborative Rain, Hail, & Snow (CoCoRaHS) Network, a national volunteer precipitation observation network, are essential for Indiana's well-being.

The Indiana State Climate Office (IN-SCO) collaborates with the National Weather Service (NWS) to coordinate Indiana's CoCoRaHS network via monthly newsletters, quarterly meetings, and the recruitment and retention of volunteers. Rain or shine, volunteers measure precipitation and report their findings to the CoCoRaHS headquarters each morning. CoCoRaHS plays a crucial role in providing high-quality precipitation data, helping to bridge gaps in data between the NWS Cooperative Observer Network, airport weather measurements, and the Purdue Mesonet. Let's quickly examine how CoCoRaHS precipitation observations fill the gap.

In January, Indiana received 1.47 inches of precipitation, which was 1.48 inches below normal and accounted for only 50 percent of the usual amount. Heavier precipitation was observed in southern Indiana, while northern regions experienced significantly lower totals (Figure 1). The addition of CoCoRaHS measurements highlighted notable differences in southern Indiana, particularly in Harrison, Crawford, Floyd, and Clark Counties. Areas in northern Indiana, especially Fort Wayne, showed broader regions with higher precipitation totals when CoCoRaHS data were included. Drought conditions showed improvement throughout January, thanks to above-normal precipitation in December. However, this improvement was followed by January precipitation levels in the northern two-thirds of the state that were 1.5 to 2 inches below normal. As a result, abnormally dry conditions have expanded

from northern Indiana to just south of Indianapolis. CoCoRaHS has helped the IN-SCO stay on top of the ever-changing drought conditions.

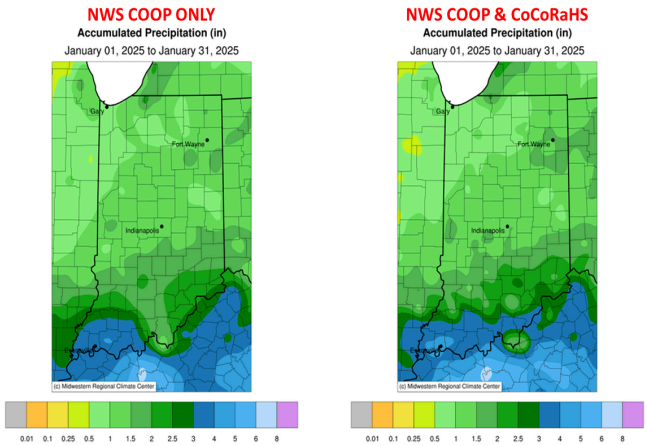



Figure 1. Left – January 2025 accumulated precipitation from NWS COOP network only. Right – January 2025 accumulated precipitation including both NWS COOP and CoCoRaHS.

We continually need new CoCoRaHS observers to help fill the gaps (Figure 2); as the saying goes, "the rain doesn't fall the same on all." In March, CoCoRaHS is hosting its annual Rain Gauge Rally, a contest to see who can recruit the most new volunteers. Indiana always gets beat by Minnesota, but we're proud of the 61 new observers we recruited last March. This helped push us to a record 185 new observers in 2024, a number we hope to expand upon in 2025.

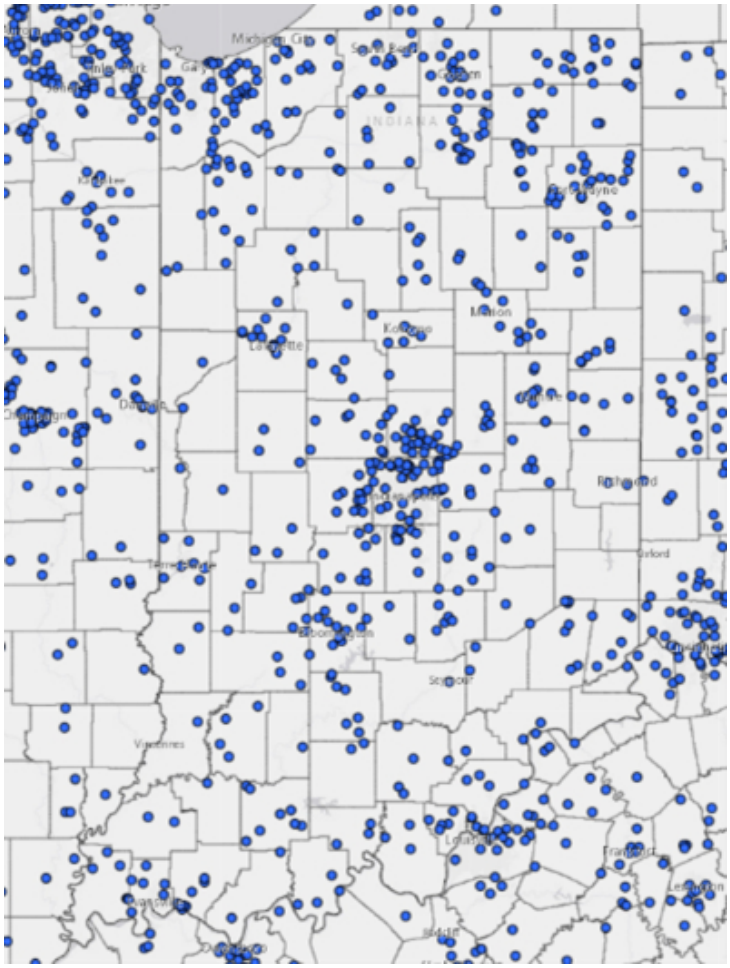


Figure 2. Active Indiana CoCoRaHS stations.

**Join CoCoRaHS!**

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