

Over the Back Fence

Agriculture and Natural Resources Extension Newsletter

HAPPY NEW YEAR!

As the year is coming to an end and holiday gatherings are in the past or some in the future, there is a full year to look back on. We should be grateful for the ones we cherish and spend our time with throughout the year. As I reflect upon the past seven months I have been with Extension, I am grateful for the knowledge gained, connections made, and community members becoming more and more involved. I am very excited to see what 2024 brings! There are some exciting events planned for the upcoming year so be on the lookout within the newsletter, Facebook, and our Extension Office Website. I hope each and every one of you have a great holiday season and Happy New Year!



Annie Gamm



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Ag Spotlight

This is a new section which features an interview of community members involved in Agriculture or Natural Resources fields!

Name: Eliza Hudson

Hometown: Mauckport, IN

Education: Bachelor's degree in Environmental Studies with a Master's degree in Environmental Science and Public Affairs

Occupations: Project Coordinator for Farmers Helping Hellbenders Regional Conservation Partnership Program



What interested you in Natural Resources?

I loved exploring and being outdoors. I took environmental science classes in college and everything took off from that point to where I am today.



What advice do you have for someone wanting a career in Natural Resources?

The best way to get experience is to find what interests you. If you are interested in something, try it out. You can reach out to people and ask to shadow them or see how others can help you. Don't be afraid to talk to other people who are interested in the same things you are.



Additional Info: I am currently working with farmers to help improve water quality, Blue River Hellbenders, and soil health. If you are interested in getting help contact me at the NRCS office in Corydon at 812-738-8124. Applications for Hellbender Conservation programs are due by January 12, 2024.



FEATURED EVENT

Ag Outlook Breakfast and Meeting



Join ANR Educator, Ariel Camm, for a complimentary breakfast and program!



Friday, January 26th, 2024



Breakfast 7:30am/Program 8:00am



247 Atwood St. Corydon, IN



RSVP: 812-738-4236

RSVP Required by January 19th!

- **Guest Presenter:**

Dr. Michael Langemeier, Professor of Agricultural Economics, Purdue University

- **Topic:**

2024 Market Outlooks - Resources to evaluate market trends for grain and livestock and the factors which impact the year ahead

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HARRISON COUNTY EXTENSION ANR EVENTS

Harrison County Cattlemen's Association Annual Meeting

When: Saturday, January 13th, 2024

Where: Harrison County Fairgrounds

Doors Open/Registration: 5:00pm

Dinner: 6:00pm

Meeting: 7:00pm with guest speaker, Mr. Warren Beeler, a Western Kentucky University Animal Science Professor and Past Director of Agriculture Policy for Kentucky Department of Agriculture. Dinner Tickets: \$10 for adults - \$5 for children (12 yrs and under) and are available at the Extension Office and at the door. Everyone needs a ticket.

RSVP by January 2nd to:

- Purdue Extension Office 812-738-4236
- OR
- Cassidy Bowyer 502-554-5124

Membership cards available at registration:

1yr = \$10.00 10yr = \$100.00 LIFE = \$200.00

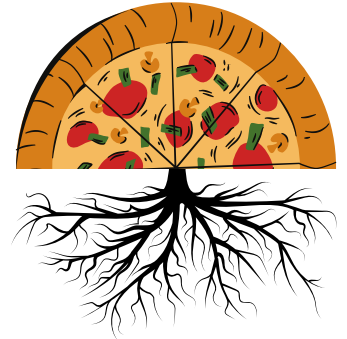


Rooted in Ag: Pizza Edition

Join ANR Educator, Ariel Camm, at the Extension Office on Tuesday, **February 6th** at 5:30pm to make your own personal take-and-bake pizza as you learn how agriculture impacts the pizzas we enjoy! (Adults Only, 18+)

Class size is limited, so sign up as soon as possible! RSVP required, call 812-738-4236 or stop by the Extension Office. The \$5 fee (cash or check) will be due by January 30th.

Office hours are Monday-Friday from 8:00am-4:30pm or you can mail it or drop it off in the drop box outside the Extension Office door.



Beginner Gardener Workshop

Join ANR Educator, Ariel Camm, at the Harrison County Extension Office for the **FREE** Beginner Gardening Workshop on Tuesday, **February 27th** at 5:30pm to learn various gardening topics and plant your own starter seeds to take home with you!

Learn about:

- How to Read Seed Packets
- Types of Gardens
- Soil Health / Testing
- Pests and Diseases

RSVP required by February 20th 812-738-4236



Annual Extension Board Meeting & Open House

You're invited to the Annual Extension Board Meeting & Open House!

Purdue Extension Harrison County invites you to our Annual Extension Board Meeting & Open House on Tuesday, **March 5th** at 6:00pm at the Extension Office. A complimentary grazing table and beverages will be provided. Thank you to Blackman Farms for sponsoring refreshments at this event.

Join us for:

- Educational Breakout Sessions
- 2023 Extension Educator Reports
- Introduction & Election of Extension Board Members
- Presentation of Awards



Please kindly RSVP by Friday, February 16th, 2024

Grow It, Cook It: Spring 2024 Series

Join ANR Educator, Ariel Camm, and HHS/CD Educator, Tara Beckman, for their “Grow It, Cook It” Spring Workshop Series. This series is all about empowering you, the participant, to go from garden to table with featured ingredients. Sample recipes, plant your own seeds to take home, and acquire educational information to help you be successful in the days and weeks that follow!

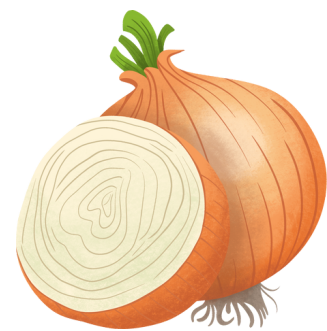
Featured Item: Onions

- **March 12th**, 5:30-6:30pm
- Registration Deadline: February 23rd

Featured Item: Brussel Sprouts

- **April 9th**, 5:30-6:30pm
- Registration Deadline: March 22nd

Don't wait to register- call our office at 812-738-4236 to begin the process. The \$5 per session fee can be paid at the Extension Office, 247 Atwood Street, Corydon, IN by the registration deadline listed above.



OTHER ANR EVENTS

Purdue's 2024 Crop Management Workshop

When and Where:

Wednesday, **January 24**: Pines Evergreen Room, 4120 US Highway 31, Seymour, IN
In-Person Only – 8:30 am to 4:00 pm

Registration and Cost:

For registration go to this link: <http://www.purdue.edu/conferences/Crop>
\$90.00 (includes handouts, refreshments, and lunch)

Topics:

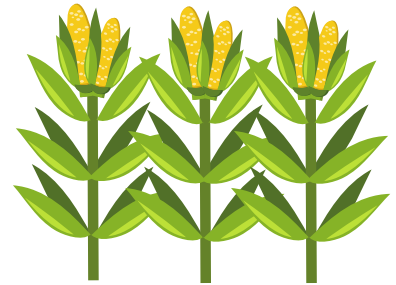
Field Crop Pests and Entomology, Pesticide Regulations and Safety, Corn and Soybean Agronomics, Weed Science and Plant Pathology

Credits Awarded: (Anticipated)

- Indiana Commercial Pesticide Applicators (CCHs)
- Certified Crop Advisors (CEUs)
- PARP (Private Applicator)

Additional Questions:

Purdue Conferences, 866-515-0023, confreg@purdue.edu



Save the Date: Purdue Beef Basics in the Eastern Cornbelt

The program begins **February 6, 2024**, with sessions happening every Tuesday (from 6:00–8:30 pm EST) and Thursday (from 7:00 – 8:00 pm EST) until March 26, 2024. The cost to participate is \$50 and the deadline to register is January 24, 2024.

Register Today:

<https://cvent.me/EBNPNV>



Harrison County Soil and Water Conservation District

77th Annual Meeting

When: Thursday, February 8th 6:30 p.m.

Where: Harrison Co. Fairgrounds

Tickets go on sale January 10th at the SWCD office

County Conservation Program Sign-ups

When: Begin on Monday, March 4th @ 8:00 a.m.

Where: Harrison Co. Government Center, 1st floor Conference Room



Midwest Cover Crops Council Conference and Annual Meeting

February 13-14, 2024 7:30 AM-5:00 PM

Crowne Plaza Indianapolis, 2501 S High School Rd, Indianapolis, IN 46241

Topics Include: Cover Crop Management, Field Crops, Specialty Crops, Grazing, and Getting Started

-Keynote by Dr. Rob Myers, Director of the MU Center for Regenerative Agriculture and SARE Regional Director of Extension Programs

-Incentives Workshop: Help Make Info about State and/or Federal Cover Crop Incentive Programs Easier to Find



Registration for Annual Meeting and Conference

\$75 through 12/15/2023, \$100 after

Register at <https://www.midwestcovercrops.org/meetings/>

Purdue is committed to making its programs accessible to individuals with disabilities. If you require an accommodation or special assistance for this program due to a disability or for additional information, please contact us at confreg@purdue.edu or call 866.515.0023.

Ag Women Engage Conference and Young Ladies in Ag Forum

Join Us For The 2024 Ag Women Engage Conference At The Grand Wayne Convention Center In Fort Wayne, Indiana on **February 22, 2024**.

The Purdue Women in Agriculture Team is excited to offer this annual event designed to educate and uplift women involved in any aspect of the agricultural industry. Through pre-conference workshops, a keynote speaker, and breakout presentations, attendees will learn how to better manage risk, enhance their farms and agribusiness operations, and network with other ag women throughout Indiana.

Registration Check-In: Starts 8:30 A.M EST

Program: 9:30 A.M. To 3:30 P.M. Eastern

Where: Grand Wayne Convention Center

120 W Jefferson Blvd,

Fort Wayne, In 46802

Conference Fee: \$100



The Young Ladies in Ag Forum will be **February 21, 2024** at the Grand Wayne Convention Center prior to the Ag Women Engage Conference. This Forum is for young ladies interested in careers in agriculture in grades 8-12 & college. Cost is \$25 per person and includes sessions about interviewing skills and jobs in agriculture, exploring next and non-traditional steps, and keynote speaker, Dirt Darlin' Emily Stewart.

Register Here: purdue.link/YLAF2024REG

WHAT IS BROADBAND?

Purdue's Broadband Team is Working to Enhance Internet Connectivity for ALL Indiana Residents

Broadband is defined by the Federal Communications Commission (FCC), a government entity that regulates telecommunications, as an internet connection that is always on and faster than dial-up.

DO I HAVE BROADBAND?

While the definition is a bit vague, it really means that if internet service available at your address (home, business, organization, etc.) is slower than 25 megabits per second or Mbps download and 3 Mbps upload (Mbps refers to the amount of data that can be handled by your internet connection), 25/3 for short, then you are considered unserved. If you do have 25/3 Mbps service but not 100/20 Mbps available, then you are considered underserved. If either of these is the case, your address could be eligible for funds to provide service of at least 100/20 Mbps. In case you were wondering, "gig" service refers to speeds of 1,000 Mbps.

The FCC unveiled a new map and needs your help to make sure your address and internet service offered are accurate. Read more on how to review your address by reading this blog post: [3 Steps to Bring Better Broadband to Indiana - Purdue Center for Regional Development](#)



WHAT TYPES OF BROADBAND TECHNOLOGIES ARE THERE?

Broadband technologies vary resulting in different internet speeds and reliability measured in Mbps per technology, but the most common ones include:

DIGITAL SUBSCRIBER LINE (DSL)

This one uses your copper phone line to provide an internet connection.

CABLE

This one is usually offered by cable companies and rely on a combination of fiber-optic and coaxial cable.

SATELLITE

This technology also requires an antenna at your address and line of sight with the satellite providing the internet connection. However, please note that this technology is not considered broadband by the upcoming federal funds. In other words, if your address has access to satellite service, you can still be considered unserved or underserved.

Cellular data provides internet service in a different way. These technologies include 3G, 4G, and/or 5G (do not confuse with 1 G(f)ig service, see above). However, these are not considered fixed broadband and if available at your address, you are still eligible for broadband funds.

FIXED WIRELESS

This technology requires an antenna and line of sight between your address and the tower providing the service.

FIBER-OPTIC

This technology relies on very thin glass fibers, usually as thick as a human hair, to provide internet service.

FIXED VS. MOBILE BROADBAND

Upcoming broadband funds can only be used for what is called fixed broadband. This refers to the fact that the end-user (a home, business, etc.) is fixed or does not move. Mobile broadband refers to cellular data plans. All technologies described here are considered fixed broadband.

One last thing, your Wi-Fi relies on these broadband technologies. Consider your broadband connection to be your main water line while Wi-Fi is the shower.

WHY IS BROADBAND ACCESS DATA IMPORTANT?

The federal government, in partnership with states, is deploying broadband funds through the Broadband Equity, Adoption, and Deployment program also known as BEAD. Indiana is receiving close to \$870 million. A map compiled by the FCC will dictate where these funds go. So, we need to make sure Indiana's map is as accurate as possible. Continue reading below for more information.

CONFLICTING BROADBAND INFORMATION

Part of the reason this map is being updated is because broadband data is very muddy. In the past, the FCC compiled data from providers that report where they offer service, with what technology, and their maximum advertised download and upload speeds. However, because this data is provider self-reported and not validated by consumers it can overestimate broadband availability. This time around, they are asking for your help to make sure the data reported by providers is accurate at the address level.

SPEED TESTS

Another wrinkle to consider is that beyond internet service being available, is the issue of reliability and quality of service. One way to measure this is through speed tests. A speed test calculates your download and upload speeds (again, measured in Mbps). If your internet connection consistently delivers speed tests below what the provider says it is providing, there may be some quality issues. This in turn may make your address eligible for funds to build more high-quality internet service. You can see what service you subscribed to by checking out your internet bill.

To conduct a speed test on your existing service or to report an address with no service, please visit: pcrd.purdue.edu/speedtest

And remember, speed tests are free so please complete as many as possible, as frequently as possible! The more data there is on your internet service, the better!



ADOPTION AND AFFORDABILITY

In addition to having access to adequate internet, another issue is adoption. Many times, internet is available, but folks do not subscribe because they may not be able to afford it. Fortunately, there is a program in place called the Affordable Connectivity Program (ACP) that provides \$30 per month to eligible homes (\$75 in qualifying tribal lands and high-cost areas). Please visit www.fcc.gov/acf for more information and for instructions on how to enroll.



The Office of Engagement fosters reciprocal relationships with external partners to address societal challenges by leveraging University resources in teaching, research, and engagement. These resources include colleges and academic units, service learning, Purdue Extension, and the [Purdue Center for Regional Development](#), to name a few.

ANR RECAP

Soil Health Workshop

ANR Educator, Ariel Camm, recently hosted two sessions of the Soil Health Workshop on November 29th and December 4th. In order to accommodate all community members, one session was offered in the evening and the other was in the afternoon. Insights were offered into the basic components of soil and its varying textures, how this affects water flow, as well as what leads to compaction and drainage issues.

Practices for maintaining soil health and sustainability were also addressed with discussion of topics such as erosion prevention, cover crops and crop rotation, and the advantages and disadvantages of conservation tillage practices. This workshop included information that would be useful to lifelong farmers, lawn enthusiasts, gardeners, or those interested in conservation issues. Thank you to everyone who came out to learn about healthy soils and to support Agriculture and Natural Resources programming in Harrison County.



Area 2 Pesticide Applicator Program

The Area 2 Pesticide Applicator Program in Crawford County was sponsored by IN Corn Marketing Council and IN Soybean Alliance, with over 30 participants.

For more information about PARP, visit:

<https://ag.purdue.edu/departments/extension/ppp/private-applicators/recertification-parp/parp-events/parp-events-all.html>



Passing It On: Farm Transition to the Next Generation

Area 2 Agriculture and Natural Resources Educators hosted a Succession Planning event on Saturday, December 9th. Participants were able to learn about how to pass the farm onto the next generation by learning about generational differences, family member roles on the farm, long term care protection, and action plans for handing the farm down. We would like to thank all of the sponsors and guest speakers for making this event possible!



ANR RESOURCES

Soil Sample Testing

Harrison County Extension Office can submit soil samples for you to A&L Labs and help with interpretation and amendments for your soil. Typical turn around for results is 10-14 days.

What does a soil test do?

Measures the organic matter, available phosphorus, exchangeable Potassium, Magnesium, Calcium, Soil pH, Cation Exchange Capacity, Percent Base Saturation of Cation Elements.

Testing Your Soil

The quantity of the nutrients in the sample determines the amount of fertilizer that is recommended. Soil tests also measure soil PH, humic matter and exchangeable acidity. Soil tests can be taken at any time, the important thing to remember is to take the sample at the same time every year!

Contact the Extension Office for more information including how to take a soil sample and cost.

Extension Challenge Kits

December Challenge Kits went out the door in record time this month! All 20 kits were distributed within the first week of the month. Thank you to Uhl's Feed and Small Engine for sponsoring these kits. This month, youth learned about dairy cattle and made a DIY cow ornament.



WHAT: What is an Extension Challenge Kit? Our monthly challenge kits provide instructions and most materials to do a DIY educational project or two on your own. The kits are geared towards ALL Harrison County community members, and focus on Extension education areas such as Agriculture and Natural Resources or Health and Human Sciences. Our kits are FREE, but come in limited quantities so be sure to check in with us at the first of each month.

WHEN: We release our challenge kits at the beginning of each month in the Extension Office. You can come in Monday-Friday 8:00am-4:30pm to pick yours up in person. Check our Facebook for information at the first of each month regarding challenge details, and feel free to call the office to see if kits are still available (limited quantities).

WHY: Our kits are a way for us to provide outreach and engage with Harrison County community members, by supplying a hands-on, project-based learning opportunity to be explored on your own. Many of our challenge kits can also be turned into projects to be submitted at the fair. Each month we have a prize for the first three completed challenges submitted. We'd love to see your completed projects in-person at the office, or you can submit your photos or videos via email to camm@purdue.edu or tdbeckma@purdue.edu or on our Facebook page by commenting on the pinned Challenge Kit post at the top of the page.

SPONSORSHIP: Would you like to support our Extension Challenge Kits by helping us provide supplies to make these challenges possible? We are looking for sponsors as we work to grow and expand our reach and efforts. Each month we currently provide 20 kits, with an estimated cost of supplies at \$2.00 per kit. We would love to further extend the challenge to the Harrison County community with your help. Please let us know if you would like to be a sponsor by contacting us at camm@purdue.edu or 812-738-4236.

Harrison-Crawford Counties, Indiana Plat Books

This Harrison-Crawford Counties Indiana Plat Book contains:

Landowner maps that concentrate on rural landownership with detailed acreage information, parcel boundaries and section lines. Each map includes highways, roads, waterways, railways and municipal boundaries.

Specialty maps include Harrison County Road Maps, Watersheds Map & Soils Map - Crawford County Road Maps, Watersheds Map & Soils Map.

3D LiDAR Aerial Maps facing the landowner map pages. The aerial maps are enhanced using elevation data from the USGS National Elevation Dataset (NED), creating a 3D effect showing the actual topography of the land.

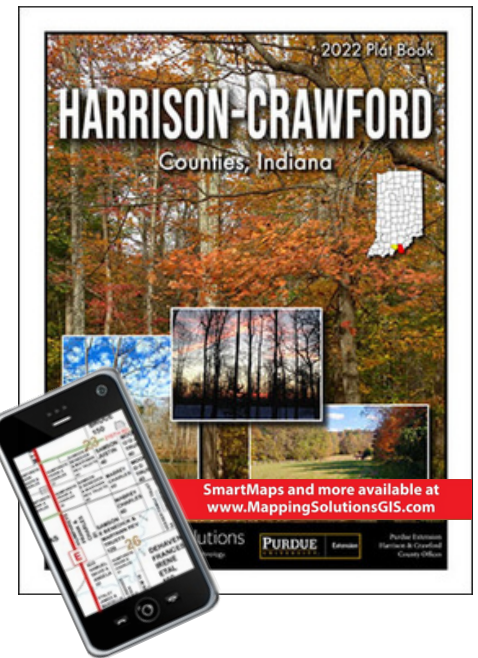
Road Index showing all roads in Harrison-Crawford Counties.

Landowner Index that allows for easy identification of rural landowners in Harrison-Crawford Counties Indiana.

Full color printing, spiral-bound, 8 1/2 x 11, 132 pages.

For purchase information, contact

Purdue Extension Harrison County: 812-738-4236



Harrison County Master Gardeners 2024 Meetings



We meet on the Third Thursday of every month at 6:30pm at the Harrison County Extension Office. Visit the Purdue Extension Harrison County ANR page for more information about Master Gardeners.

<https://extension.purdue.edu/county/harrison/ANRHomePage.html>

- January 18th
- February 15th
- March 21st
- April 18th
- May 16th
- June 20th
- July 18th
- August 15th
- September 19th
- October 17th
- November 21st
- December 19th

Harrison County Cattlemen's Association 2024 Meetings

We meet on the First Wednesday of every other month at 7:30pm at the Extension Office (even numbered months).

Visit the Purdue Extension Harrison County ANR page for more information about the Harrison County Cattlemen's Association.

<https://extension.purdue.edu/county/harrison/ANRHomePage.html>

- February 7th
- April 3rd
- June 5th
- August 7th
- October 2nd
- December 4th



National Cattlemen's Beef Association Redbooks

The Redbook is a pocket-sized record book that contains more than 100 pages to record calving activity, herd health, pasture usage, cattle inventory, AI breeding and sales, plus a date book and notes section. The book also includes Beef Quality Assurance national guidelines and proper injection technique information. 2024 Redbooks are on order.

Available Soon!



AG EDUCATION & INFORMATION

PURDUE RESEARCHERS FIGHTING TAR SPOT

PUBLISHED ON FEBRUARY 1, 2024 | MORNING AG CLIPS

“Americans are turning to dairy like never before as part of their health regimen, to celebrate with family and friends, or to liven up their meal and snacking routines,” said Michael Dykes, D.V.M., president and CEO of the International Dairy Foods Association. “The data from USDA demonstrate how consumers continue to choose dairy products even as they exercise cost-conscious shopping, illustrating how dairy remains affordable and accessible to all people. Dairy is more than a food or beverage—it has become an essential part of our lives, in more than 95% of U.S. households on any given day. The growth in dairy consumption is a testament to America’s dairy foods makers who offer wholesome, delicious, affordable products for people all ages, all year around.”

SETTING YOUR POINSETTIAS UP FOR SUCCESS

Texas A&M AgriLife horticulturists share tips and best practices

PUBLISHED ON DECEMBER 4, 2023 BY MORNING AG CLIPS

COLLEGE STATION, Texas — Poinsettias and their classic red and white holiday color will soon be abundant in homes, grocery stores and nurseries. If you want your poinsettia plants to last throughout the holiday season, here are some pointers to help keep your plants happy.

Bill McKinley, an instructional professor and Benz Endowed Chair in Floral Design; and Navreet Kaur Mahal, Ph.D., instructional assistant professor, both in the Department of Horticultural Sciences in the Texas A&M College of Agriculture and Life Sciences, explain how to care for your poinsettias and provide tips for consumers.



These gorgeous holiday plants, native to Mexico, are the No. 2 dollar-valued potted plant in the U.S. behind orchids. McKinley said poinsettias were introduced domestically by Joel Poinsett in the 1800s and have since been bred to maximize the colors and varieties of the plant.

How to pick your poinsettias

When it comes to picking a good poinsettia plant, the color of the petal you choose doesn't impact how long your plant lasts. You should be looking in the center of the plant to find the healthiest plant.

"The little center of the poinsettia plant, the true blossom, shouldn't be fuzzy," McKinley said. "They should be tight and yellow."

Making sure your plants last

If you want to keep your plant alive during the holiday season, you should keep a light hand when watering your poinsettias.

McKinley said one of the most common errors with the plant is overwatering. Poinsettias don't like when the roots are sitting in water, which can happen if they are left in the waterproof container that they are often sold in.

The best way to water is to take your plant out of the container so that the water can drain before you put it back in its container, he said.

"If you water your poinsettia and leave it in that container, the water will drain down and the plant will be sitting in water, causing root rot," McKinley said.

How to make your poinsettias thrive

Where you choose to display your poinsettias can impact your plants. McKinley said it is best to keep your plants in bright but indirect sunlight. It is also important to keep your plants away from heaters or air conditioners.

Mahal said poinsettias should be kept away from areas that fluctuate in temperature.

"The ideal room temperature for plants is between 65-70 degrees," she said. "And avoid exposing them to temperatures below 50 degrees."

Poinsettias and pets

Contrary to popular belief, poinsettias are not toxic to our furry friends. Mahal said that poinsettias are not a major point of concern with pets.

"The sticky white sap can irritate the mouth and cause mild gastrointestinal symptoms," Mahal said. "But they are not a threat to animals."

Keeping your plants year-round

Consumers should also know that they don't have to throw out their plants as soon as holiday décor is taken down. With proper care, poinsettias can last years and provide annual blooms each holiday season.

McKinley said to prune the plant halfway up the main stem soon after the holidays and replant them in a larger size pot. Put them in bright light indoors and a shady area outdoors once the temperatures are consistently above 60 degrees. Keep the plant watered.

"You might have to pinch the tips to keep it bushy," McKinley says, "But in July, you'll have to stop pinching or you won't get any flowers."

The plant should be protected from artificial light after the fall equinox to promote poinsettia blooms. So, bring them inside and place them in total darkness between sundown and sunrise.

"In late October and the first part of November, your plant will start to show color," McKinley said. "And by Christmas it should be in full bloom."

—Katharine Cook

Texas A&M AgriLife Communications

GLYPHOSATE'S DECLINING WEED CONTROL OVER 25 YEARS

PUBLISHED ON DECEMBER 5TH, 2023 BY MORNING AG CLIPS

URBANA, Ill. — It has been a quarter century since corn and soybeans were engineered to withstand the withering mists of the herbicide glyphosate. Initially heralded as a “silver bullet” for weed control, the modified crops and their herbicide companion were quickly and widely adopted across corn and soybean-growing regions of North America. In the years that followed, though, weeds targeted for eradication quietly fomented a rebellion.

A new PNAS Nexus study led by scientists from the USDA Agricultural Research Service (USDA-ARS) and the University of Illinois Urbana-Champaign takes a retrospective look at glyphosate efficacy after the engineered crops were commercialized. Amassing data from annual herbicide evaluation trials at land-grant universities across the U.S. and Canada, the researchers show a significant and rapid decline in glyphosate control for all seven major weed species they examined.



“Our analysis represents one of the largest cumulative measures of how weed communities have adapted to the simplified weed management tactics adopted at an unprecedented scale throughout North America,” said Chris Landau, postdoctoral researcher for USDA-ARS and first author on the paper.

Although glyphosate provided superior weed control in the early years, most of the weeds in the dataset showed signs of adaptation to the chemical in just two to three years. Within a decade, weeds were up to 31.6% less responsive to glyphosate, with further linear declines as time went on.

“Nature did exactly what we were trying to help people avoid: it adapted,” said co-author Aaron Hager, professor and faculty Extension specialist in the Department of Crop Sciences and Illinois Extension, part of the College of Agricultural, Consumer and Environmental Sciences (ACES) at U. of I.

In addition to loss of control, glyphosate efficacy became more variable over time.

“When glyphosate-tolerant crops were first adopted, weed control was high in every environment; however, year after year glyphosate performance became less consistent,” said co-author Marty Williams, an ecologist with the USDA-ARS and affiliate professor of crop sciences. “For example, glyphosate provided nearly 100% control of a given species in most plots in the mid-1990s. But over time, acceptable weed control became rarer, often deteriorating below 50%, 30%, and worse.”

These patterns were derived from annual herbicide evaluation trials conducted at land-grant universities, usually in conjunction with their respective Extension services. These carefully managed trials test new and existing herbicides against numerous common and troublesome weed species. Most land-grant universities have multiple herbicide evaluation trials running statewide each year, with some continuously operating since the 1970s.

A couple of years ago, Landau, Hager, and Williams mined historical data from U. of I. herbicide evaluation trials to look at the effect of climate change on weed control in Illinois corn and soybean fields. When they decided to look at the history of the country’s most widely used herbicide, the team knew it would be more powerful to access data beyond Illinois. In cooperation with 24 institutions throughout North America, Landau compiled a massive database representing nearly 8 million observations from 1996 to 2021.

For the current study, Landau winnowed the data down to fields that tested glyphosate annually, alone or in combination with a pre-emergence herbicide. He also narrowed the target weeds to seven major players: annual and giant ragweed, horseweed, lambsquarter, Palmer amaranth, velvetleaf, and waterhemp. In the end, the dataset represented trial data from 11 institutions.

After documenting patterns of glyphosate control and variability over time, Landau re-ran the analysis for plots in which a pre-emergence herbicide had been applied before glyphosate. The results were strikingly different. “Adding a pre-emergence herbicide effective against the target weed species significantly improved control and reduced variability of glyphosate over time,” Landau said. “The most we saw for any weed species was a 4.4% loss of control per decade, compared to 31.6% loss for glyphosate alone.”

GLYPHOSATE'S DECLINING WEED CONTROL OVER 25 YEARS

Continued...

Hager isn't surprised. Along with several U. of I. colleagues, he has been cautioning against reliance on any single chemistry for 15 years. His 2008 recommendation aimed at avoiding glyphosate resistance included guidance to use a pre-emergence herbicide at the full rate. Far from common practice at the time, the recommendation was largely ignored.

"Having already seen loss of control with ALS- and PPO-inhibitors [other classes of herbicides], we eventually reached the point where we felt it necessary to come out with some very specific recommendations for glyphosate. Because if we didn't, we had a pretty good idea of where this was going to end up," Hager said. "And, unfortunately, we were right."

The dataset for glyphosate can only show patterns, not explanations. While herbicide resistance might be to blame — the issue has become a major problem in agricultural weeds in recent decades — it's not the only reason glyphosate may have loosened its grip.

Landau noted that two species he tracked in the analysis — velvetleaf and lambsquarter — have not yet had a confirmed case of glyphosate resistance anywhere in the world. Yet both followed the same trends as glyphosate-resistant species in the dataset. He said herbicide pressure — or concurrent climate changes — over the past 25 years may have selected for larger leaf area or earlier emergence, both of which could help weeds survive glyphosate.

Regardless of the mechanism, the pattern is clear: silver bullets for weed control don't exist. The researchers urge diversification in chemistries, including soil- and foliar-applied products; crop rotation patterns; and mechanical controls.

And if another silver bullet is marketed in the future? Hager says the glyphosate story should serve as a cautionary tale.

"Let's imagine a company says they have the next silver bullet. It's going to enjoy a huge market share almost instantaneously. But it needs to come with a stewardship plan to better preserve that chemistry over time," he said. "Why would we think nature would behave any differently? It won't."

The study, "The silver bullet that wasn't: Rapid agronomic weed adaptations to glyphosate in North America," is published in PNAS Nexus [DOI:10.1093/pnasnexus/pgad338]. Landau and Williams are with the Global Change and Photosynthesis Research Unit of USDA ARS, which supported the study.

—Lauren Quinn
University of Illinois Urbana-Champaign

CLOVER SEED IN SHORT SUPPLY

POSTED ON **NOVEMBER 30, 2023** BY UK FORAGE NEWS

Red and white clover are currently in short supply, both in the U.S. and worldwide. This means that if you want to frost seed clover in February you are advised to purchase or line up your seed before Christmas. Improved varieties will be especially difficult to obtain if you wait until the last minute. To find the best adapted varieties for KY, go to the variety tab on the UK Forage Website and review the [Long Term Summary](#)

(<https://forages.ca.uky.edu/files/pr816.pdf>)

Red clover is page 4 and red clover is page 5.



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