

# THROCKMORTON PURDUE AGRICULTURAL CENTER RESEARCH AND DEMONSTRATION PROJECTS 2023

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## Department of Agronomy

### **Corn Response to Hybrid Type, Seed Depth, and Down Force**

Research trial with Tom Bechman of Indiana Prairie Farmer examining corn emergence and yield response to different seed depths and down force settings.

Contact: Dan Quinn, Tom Bechman

### **Corn Response to After-market Closing Wheel Use Following Rye Cover Crop**

Graduate student research trial examining corn emergence response to multiple company after-market closing wheels when seeding into a rye cover crop.

Contact: Dan Quinn, Riley Evers

### **Sulfur x Pdate and Foliar Protection (Field Scale)**

Potential synergies with baseline sulfur application and in-season R4 applications of fungicide and insecticide.

Contact: Shaun Casteel, Andrew Holderbaum

## Department of Botany & Plant Pathology

### **Tomato Seed Trial**

Harvest seeds from field grown Tomatoes to use for in-class experiments.

Contact: Denise Caldwell, Anjali Iyer-Pascuzzi

### **Sentinel Plot Scouting**

Observe row crop diseases throughout the growing season.

Contact: Darcy Telenko, Steven Brand, Su Shim

### **Fungicide trials on ornamentals: Peonies, spruce, lilacs, dogwoods, and redbud**

This is both industry and IR4 trials.

Contact: Jana Beckerman

### **Phototoxicity of tea tree oil (Regev) as an adjuvant with difenoconazole**

Confirming that despite being called an oil, that Regev is safe and effective for use.

Contact: Jana Beckerman

### **SOY23-SENTINAL-TPAC**

Monitoring of crop disease development in soybeans over the growing season.

Contact: Darcy Telenko, Steven Brand, Su Simm

## **Department of Botany & Plant Pathology (continued)**

### **COR23-SENTINAL-TPAC**

Monitoring of crop disease development in soybeans over the growing season.

Contact: Darcy Telenko, Steven Brand, Su Simm

### **23-TPAC-Corn-09**

Short corn weed control systems/efficacy.

Contact: Bill Johnson, Bryan Young

### **23-TPAC-Corn-08**

Diflexx PRE w/ Residual herbicides efficacy trials.

Contact: Bill Johnson, Bryan Young

### **23-TPAC-Corn-02**

Kixor Innovation corn 1

Contact: Bill Johnson, Bryan Young

### **23-TPAC-Corn-03**

BAS 821 residual control in corn.

Contact: Bill Johnson, Bryan Young

### **23-TPAC-Soy-01**

Engenia PRE/POST soybean trials.

Contact: Bill Johnson, Bryan Young

### **23-TPAC-Soy-02**

BAS 842 in Xtendiflex soybean trials.

### **23-TPAC-Soy-03**

BAS 842 in Enlist soybean trials.

### **23-TPAC-Corn-01**

Anthem Maxx Programs for residual weed control in corn.

Contact: Bryan Young, Bill Johnson

### **23-TPAC-Soy-06**

Syngenta herbicides in the Enlist soybeans.

Contact: Bryan Young, Bill Johnson

### **23-TPAC-Corn-04**

Maverick programs for weed control in corn.

Contact: Bryan Young, Bill Johnson

### **23-TPAC-Corn-05**

Summit herbicide trials for corn.

Contact: Bryan Young, Bill Johnson

### **23-TPAC-Soy-06**

Fierce Products PRE in Liberty Link soybeans.

Contact: Bryan Young, Bill Johnson

### **23-TPAC-Corn-05**

Maverick Two-pass Programs in corn.

Contact: Bryan Young, Bill Johnson

## Department of Botany & Plant Pathology (continued)

### **23-TPAC-Soy-07**

Giant ragweed control with SAUSX08 in soybeans.  
Contact: Bryan Young, Bill Johnson

### **23-TPAC-06**

Storen PRE and Sequential treatments in corn.  
Contact: Bryan Young, Bill Johnson

### **23-TPAC-Corn-11**

Caballero (clopyralid + flumetsulam) in field corn.  
Contact: Bryan Young, Bill Johnson

### **23-TPAC-Lucas-01**

Roller crimper trials in cover crops.  
Contact: Bryan Young, Bill Johnson

### **23-TPAC-Lucas-02**

Long-term cover crop effects in corn/soybean rotation.  
Contact: Bryan Young, Bill Johnson.

### **23-MGS-Soy-05**

Xtendimax paired soil residual/soybean/PRE/ efficacy and phyto trials.

### **23-MGS-Corn-03**

SIPCAM products PRE in corn trials.

### **23-MGS-Corn-01**

Resicore XL + Kyro in Enlist corn.

### **23-MGS-Soy-01**

Enlist Programs demonstration plots.

### **23-MGS-Soy-02**

Authority products for residual weed control in soybean systems.

### **23-MGS-Corn-02**

UPL herbicide trials in corn.

### **23-MGS-Soy-03**

Preview 2.1 and Velexi for weed control in soybeans.

### **23-MGS-Soy-03**

Syngenta product comparison in Enlist soybeans.

### **23-MGS-Corn-02**

Summit herbicide programs for corn.

### **23-MGS-Corn-04**

Evaluation of Tough R and Tough R + Atrazine for waterhemp control in corn.

## Department of Botany & Plant Pathology (continued)

### **23-MGS-Soy-04**

Preview 2.1 weed control programs in soybeans.

### **23-MGS-Soy-07**

Fierce products PRE in Plenish Soybean.

### **23-MGS-Soy-03**

Fierce products PRE in Enlist soybeans.

### **23-MGS-Corn-06**

Glufosinate corn showcase.

### **23-MGS-MEIGS-**

Glufosinate soybean showcase.

### **23-MGS-Soy-07**

Burndown weed control programs for Horseweed control.

### **23-MGS-Estevan Cason-**

Early planted soybean trial.

### **23-Purdue-Meigs**

Precision cover crop trials.

### **23-Purdue-Meigs**

USB cover crop trials.

## Department of Entomology

### **Evaluating role of organic and synthetic insecticide rotations on Collard pests**

We will conduct a variety trial with collards to evaluate the role of variety selections and synthetic and organic insecticide rotations as an IPM strategy

Contact: Elizabeth Long

### **Monitoring tree fruit insect pests**

Monitor codling moth, oriental fruit moth, and brown marmorated stink bugs in 2-3 apple blocks

Contact: Elizabeth Long

### **Evaluating the sensitive of SWD monitoring tools in blackberries**

Evaluate two types of monitoring traps for the invasive spotted-wing drosophila, a vinegar fly that attacks small fruit while it is still ripening on the plant. We will use the commercial Scentry SWD monitoring trap, which uses a jelly-pouch lure suspended above a 25% apple cider vinegar drowning solution, and a newer trece SWD monitoring trap, which uses a lure to capture adults directly on a sticky trap, without drowning solution. We will monitor SWD activity using both trap types during the summer of 2023 and at the end of the season, compare date of first detection and the total number of adults detected with each trap type. This information will help inform small fruit growers about the most effective and easy-to-use monitoring tools for SWD.

Contact: Elizabeth Long

## **Department of Entomology (continued)**

### **Developing pollinator-friendly lures to monitor cucumber beetles in cucurbit production**

Striped cucumber beetle quickly aggregates in a wide range of cucurbit hosts including watermelon, squash, cucumber, and pumpkin where they can transmit lethal diseases. Existing management practices rely heavily on insecticide use, which could have negative non-target effects on honeybees and other pollinators that increase yield. This study aims to develop lures that attract cucumber beetles without distracting pollinators.

Contact: Ian Kaplan, Rachel Youngblood

### **Spider mite outbreak on watermelon**

Pests are a concern for watermelon growers and pesticides are routinely applied in commercial fields to control them. However, overly aggressive insect management could trigger spider mite outbreaks. IPM programs based on thresholds can minimize secondary pest outbreaks. Additionally, rye is used to protect watermelon seedlings from sand blasting damage but growers believe rye can also act as a bridge to the crop for spider mites, and they may spray more unnecessary miticides. We hypothesize that intensive insecticide programs and rye cover crop can facilitate spider mite outbreaks, whilst using an IPM program for insect control and no rye would prevent spider mites from outbreak with no miticide applications need.

Contact: Ian Kaplan, Zeus Mateos

### **Flowering cover crops on watermelon**

Most watermelon producers use rye as an intercrop that functions primarily as a wind-break to prevent sandblasting damage to vulnerable, newly-transplanted seedlings. However, rye may act as a 'green bridge' for critical pests (e.g., spider mites) leading to preventative and expensive miticide applications. Also, rye is a grass with limited resources (e.g., nectar, pollen) to sustain beds and/or natural enemies. This project will test flowering cover crops that are both non-hosts for mites and non-crop food resources to boost beneficial insects.

Contact: Ian Kaplan, Zeus Mateos

### **Black soldier fly compost amendments to specialty crops**

We will be examining the efficacy of black soldier fly derived compost as a soil amendment for the production of specialty crops, specifically carrots and a leafy green.

Contact: Laura Ingwell, Milena Agila

### **Sweet Corn insecticide efficacy trial**

Examining five different planting dates, all with the same cultivar to evaluate the efficacy of 4 different insecticide spray schedules. Planting dates will extend from as early as we can get into the fields through late June.

Contact: Laura Ingwell

### **High tunnel TSSM biocontrol**

As part of the USDA SARE R&E grant we will be looking at the efficacy of two different predatory mite species in managing TSSM on cucumbers.

Contact: Laura Ingwell

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Contact: Laura Ingwell, Leslie Aviles

## **Department of Entomology (continued)**

### **High tunnel pest management**

As part of the specialty crop research initiative grant, we will be looking at the role of weeds and companion plants in pest-natural enemy dynamics in diverse cropping systems.

Contact: Laura Ingwell, Samantha Wilden

### **Black soldier fly composting bins**

This research is looking at their viability through winter, quality of the compost, and best practices for harvesting the flies and compost material.

Contact: Laura Ingwell

### **Squash Vine Borer Trapping Network**

Monitoring the activity of Squash Vine Borer in bucket traps and reporting the trap catches online for informed grower decision making.

Contact: Laura Ingwell

### **Bee and butterfly forage garden**

In an effort to supply a dedicated area of pesticide free, diverse, and season-long forage for a range of pollinating insects used in research and extension, an area of Meigs is being "rehabilitated" to remove poison ivy, brambles, and other low-value (for pollinators) species and replace with a mix of annual and perennial wildflowers and forbs that are native to the area.

Contact: Christian Krupke

## **Department of Horticulture & Landscape Architecture**

### **USDA AFRI Grant – Taking the next step as a small and medium-sized farm: Understanding the integration of production, food safety, and profitability**

To improve the profitability of small and medium-sized vegetable farms by developing a research-based extension program that increases strategic soil to market decision making by farmers titled Soil to Market Decision Making. The project has three objectives: 1) improve farm planning practices of small and medium-sized vegetable farmers; 2) increase farm production capacity and produce quality by enhancing farmers' ability to manage soil health while using appropriate genetic materials; and 3) increase farmer profitability by enhance.

Contact: Petrus Langenhoven, Nathan Shoad

## **Department of Horticulture & Landscape Architecture (continued)**

### **Apple Progeny**

Evaluation of Apple progeny blocks.

Contact: Peter Hirst

### **Wine Grape Research**

Replicated variety and advanced selection trial, advanced selection observations, a few bulk rows for miscellaneous studies (Ripe Rot, SWD management, leaf phylloxera control, frost damage mitigation, etc.

Contact: Miranda Purcell

### **Hort 318 Nursery Production**

Manage the entire process of potted nursery plants grown outdoors for educational purposes. This process includes, up-potting, irrigation installation, pruning, spacing, etc.

Contact: Kyle Daniel

## **Department of Horticulture & Landscape Architecture (continued)**

### **Open-pollinated food grade corn demo**

OP corn demo is intended to showcase four different varieties of food grade corn that may help diversify small farms crop rotations and produce offerings. Demo will feature three flint corn and one popcorn. The demo will be managed organically and with low tech/ hand-powered tools whenever possible to mimic conditions/ tech on many small farms.

Contact: Ashley Adair

### **Manure evaluation trial (MET)**

The MET project aims to understand the relationship among manure physical and chemical properties and soil and crop health and quality. Manure from six different animal species will be evaluated along with a commercial organic fertilizer control.

Contact: Moriah Bilenky

### **Vegetable-small grains integration**

Evaluate vegetable-small grain integration for enterprise diversification and seed seedbank reduction.

Contact: Moriah Bilenky

### **Determine optimal roll time of sunnhemp for cover crop based reduced tillage (CCRT) vegetable systems**

Conserving soil resources and improving soil health are on the forefront of farmers. Policy makers, and even consumers minds. Reduced tillage is challenging for vegetable production systems due to the need to prepare beds and cultivate. In addition, the short season nature of many vegetable crops often results in nitrogen asynchrony from cover crop decomposition and cash crop uptake. Previous research investigating legumes for reduced tillage systems have had varying results. New cover crop options for reduced tillage vegetable systems production are needed. This project aims to evaluate sunnhemp for a reduced tillage vegetable system. Sunnhemp has shown it can provide large quantities of biomass in addition to its upright stature. These both attributes conducive to a cover crop based reduced tillage system. In addition, sunnhemp can provide up to 134kg/ha of N, which could eliminate or reduce N asynchrony issues observed in cereal rye CCRT systems. This project aims to determine the 1. optimal time to roll sunnhemp, 2. measure N release from cover crop residue and estimate cash crop uptake.

Contact: Moriah Bilenky

### **Multi-Year Plasticulture Strawberry Cover Crops Trial**

The objective is to determine if cover crops can be used to suppress weeds in row middles for multi-year Plasticulture strawberry production.

Contact: Stephen Meyers, Jeanine Arana

### **Multi-Year Plasticulture Strawberry herbicides programs**

The objective is to determine viable herbicide-based weed control programs for Plasticulture strawberries grown for two harvest seasons. It will include a combination of pre-transplanting, fall, a spring, and post-harvest application timings of different herbicides.

Contact: Stephen Meyers, Jeanine Arana

## **Department of Horticulture & Landscape Architecture (continued)**

### **Evaluation of in-row spacing effect on weed-suppression in sweet potato organic system**

Weed interference is a serious challenge for many sweet potato producers globally. This experiment will help us evaluate the effects of in-row crop spacings on yield of sweet potato and weed suppression. We will also use cultivars a factor, comparing prostrate growth cultivars to upright or bunch-type growth cultivars. We will have our three spacings (20cm,30cm,40com) as our main factor or treatment and cultivars and environment (weed free vs critical weed free period) as sub-factors.

Contact: Stephen Meyers, Emmanuel Cooper

### **Pumpkin-Burndown**

Glyphosate-resistant mares tail is a primary concern of Indiana no-till pumpkin growers. This trial looks at potential burndown options to manage mares tail (if present) and document pumpkin crop safety to burndown treatments.

Contact: Stephen Meyers, Jeanine Arana

### **Pumpkin- Post- Directed Herbicides**

It is anticipated that Rely (glufosinate) will become available for post-directed application in cucurbits in 2023. This study compares crop safety of glufosinate with two currently labeled herbicides for this use- Aim (carfentrazone) and Roundup (glyphosate) when a row middle application contacts a portion of the pumpkin vine.

Contact: Stephen Meyers, Jeanine Arana

### **Potato-Silage Tarp and Herbicides**

Silage tarps are used by small farms to manage weeds after planting and before crop emergence in carrots. We want to see if this will work for potatoes as well. This study will investigate the use of silage tarps for early season weed control along with cultivation and herbicides for longer season control.

Contact: Stephen Meyers, Josue Cerritos

### **Watermelon- Herbicide Systems**

The study will look at combinations of Section 3 and Section 24C herbicides per-transplanting and at layby to determine which system can provide season-long weed control in row middles.

Contact: Stephen Meyers, Jeanine Arana

### **Katagon Herbicide in Sweet Corn**

Compare Katagon formulations with and without safener for sweet corn response and weed control.

Contact: Stephen Meyers

## **USDA**

### **Long Term Phosphorous Stratification Study**

Purpose of project is to quantify the effects phosphorous products and crop rotation on yield and soil quality in corn and soybean.

Contact: Javier Gonzalez, Brenda Hoffman

### **Legacy Phosphorous Study**

Evaluation of soil phosphorous levels under different application rates.

Contact: Javier Gonzalez, Brenda Hoffman



## **USDA (continued)**

### **Long Term Erosion Study**

Quantify the effects of tillage systems and crop rotations on corn and soybean yields and soil quality.

Contact: Javier Gonzalez, Brenda Hoffman