

2024 DAVIS-PURDUE AGRICULTURAL CENTER RESEARCH AND DEMONSTRATION PROJECTS

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Department of Agronomy

Indigenous Soil Potassium (K) Supply, Fertilizer K Use-Efficiency, and K Budgets in Indiana Corn and Soybean Production

Purpose: Evaluate the agronomic efficiency of currently recommended K fertilizer rates; evaluate theoretically improved soil K tests for the ability to predict soil K supply.

Contact: Shaun Casteel Agronomy and Alex Helms, Assistant Director Purdue Ag Centers

Corn Seeding Rate Study DIFM

Purpose: Evaluate corn seeding rates with plot design using the DIFM program.

Contact: Dan Quinn, Agronomy

Corn Response to N-Fixing Biological Treatments Across Nitrogen Fertilizer Rates

Purpose: Evaluate Proven 40 OS seed treatment

Contact: Dan Quinn, Agronomy

Corteva BioStimulant Program Study

Purpose: Evaluate biostimulants for corn productions.

Contact: Dan Quinn, Agronomy

Soybean Seeding Rate Trial

Purpose: Identify agronomically and economically optimum seeding rates for soybean production in Indiana.

Contact: Shaun Casteel; Agronomy

Sulfur by Foliar Protection Study

Purpose: Evaluate potential synergies with sulfur application and in season fungicide and insecticide in soybeans

Contact: Shaun Casteel; Agronomy

Department of Agronomy (continued)

Soybean Inoculant After Continuous Corn Study

Purpose: Evaluate Inoculants and AMS in soybeans after continuous corn

Contact: Shaun Casteel; Agronomy

Corn Response to Nitrogen Fertilizer Application Timing Following a Rye Cover Crop

Purpose: To determine optimum nitrogen fertilizer timing in corn following a rye cover crop. Nitrogen fertilizer application timings include starter + V6, starter + V10, and starter + V6 + V10.

Contact: Dan Quinn, Agronomy

UAV Stand Assessments of Soybean (Seeding Rate x Plant Type)

Purpose: Use UAV imagery to assess stand establishment as well as standard protocol for scouting of soybean early to late season.

Contact: Shaun Casteel, Agronomy

Long Term Impact of Cover Crops on Cash Crop Nutrient Uptake, Yield & Nitrogen Application Rate

Purpose: Evaluate barriers in cover crop inclusion; deepen our understanding of cover crop to affect the availability of manure and inorganic Nitrogen to cash crops in multiple cropping systems.

Contact: Shalamar Armstrong, Agronomy

Purdue Automated Agricultural Weather Station (PAAWS)

Purpose: Automated collection of weather data from this site is sent to the Indiana State Climate Office at Purdue University - data can be observed at:

<http://climate.agry.purdue.edu>

Contacts: Beth Hall; Agronomy

School of Engineering

Crop Residue Study

Purpose: We will collect traditional crop residue cover percentage measurements using line transect methods and also collect ultra-fine spatial resolution UAS data over the same field. The UAS data will provide means to generate wall-to-wall estimates of crop residue cover percentage of each field, which then can be used to scale the crop residue cover percentage estimation using spaceborne remote sensing technology.

Contact: Jinha Jung and Seth Hackney, School of Civil Engineering

Topography Influences on Crop Yield

Purpose: Use high resolution LIDAR topography data to evaluate water flow and moisture

Contact: Dennis Buckmaster, Ag and Biological Engineering

Department of Botany & Plant Pathology

Field Scale Corn Fungicide Plots – Drone and Ground Sprayer Application

Purpose: Evaluate drone and ground sprayer applications of corn fungicides.

Contact: Darcy Telenko, Botany and Plant Pathology

Field Scale Soybean Fungicide Plots – Drone and Ground Sprayer Application

Purpose: Evaluate drone and ground sprayer applications of soybean fungicides.

Contact: Darcy Telenko, Botany and Plant Pathology

Soybean Sentinel Plots

Purpose: Monitor soybean diseases in soybeans throughout the growing season.

Contact: Darcy Telenko, Botany and Plant Pathology

Corn Sentinel Plots

Purpose: Monitor corn diseases in corn throughout the growing season.

Contact: Darcy Telenko, Botany and Plant Pathology

Weed Science Herbicide Evaluation

Field E (USDA): Evaluation of drone application spray swath, spray deposition and glufosinate efficacy on waterhemp and common ragweed.

GWEST

- 1) Evaluation of drone application spray swath, spray deposition and glufosinate efficacy on waterhemp (site 2)
- 2) Confidential CHS evaluation of glufosinate formulations and adjuvants
- 3) Confidential Bayer CropSciences evaluation of experimental herbicide premixes for control of PPO-resistant waterhemp

Drone trials funded by Indiana Soybean Alliance and United Soybean Board

Contact: Bryan Young and Bill Johnson, Botany and Plant Pathology

Collaborations

Controlled Drainage for Improvement of Water Quality

Interaction of Management Practices on Soil Health and Water Quality

Purpose: Develop management techniques using cover crops and gypsum to increase soybean yield while maintaining soil health.

Contact: Brenda Hofmann, Biological Science Technician and Javier Gonzalez, Soil Scientist with USDA-ARS National Soil Erosion Research Lab

Collaborations (continued)

FMC Agricultural Solutions

1. 200 Preemergence Mixtures for annual weed control in field corn in high OM soils – 16 treatments x 3 Reps
2. 201 Preemergence compounds for annual weed control in corn and soybeans – 11 treatments x 3 reps
3. 204 Preemergence Mixtures for annual weed control in field corn in high OM soils – 14 treatments x 3 Reps
4. 206 Preemergence Mixtures for annual weed control in field soybeans in high OM soils – 11 treatments x 3 Reps
5. 242 Experimental compound premixes for weed control and crop safety in soybeans – 14 treatments x 3 reps
6. 248 Preemergence formulation testing on experimental compounds – 8 treatments x 3 reps
7. 249 Post emergence formulation testing on experimental compounds – 14 treatments x 3 reps

Purpose: Evaluate Crop Response of Corn/Soy, overall efficacy of all weed species present (% control), and stalk or root lodging (corn only). In soybean trials, stand counts were evaluated to characterize the treatment effect of heavy rains after chemical application.

Notes were taken on symptomology on both the crop and weed species. Soil samples were taken in order to compare results at DPAC with trials implemented at other sites around the Midwest with similar soil properties.

Contact: Scott Swanson, FMC Agricultural Solutions, Field Development Representative - Midwest

Cover crops, phosphorus and sulfur management on soil quality and grain yield Purpose: Evaluate the effects of cover crops on soil phosphorus, sulfur and soil quality and grain yield

Contact: Brenda Hofmann, Biological Science Technician and Javier Gonzalez, Soil Scientist with USDA-ARS National Soil Erosion Research Lab

Legacy of Phosphorus

Purpose: Evaluate soil phosphorus drawdown rates, plant phosphorus uptake, and potential changes in corn and soybean yield with elimination of phosphorus fertilizer to long- term Fertility research plots.

Contact: Brenda Hofmann, Biological Science Technician and Javier Gonzalez, Soil Scientist with USDA-ARS National Soil Erosion Research Lab

Collaborations (continued)

Influence of the rate and frequency of FGD gypsum applications and cover crops on soil health and water quality

Purpose: Determine the effects of gypsum on grain yield and soil and water quality.

Contact: Brenda Hofmann, Biological Science Technician and Javier Gonzalez, Soil Scientist with USDA-ARS National Soil Erosion Research Lab

National Weather Service Weather Station (NWS)

Purpose: Record weather data on a daily basis and maintain weather record data base.

Contact: Brad Herald, National Weather Service

Purdue Extension

UAV Red-Edge Imagery to Identify Nitrogen Deficiencies in Corn

Purpose: Document differences in light reflection in red-edge light from different corn hybrids

Contact: Mark Carter, UAV Extension Specialist

Department of Entomology

Resilient Agriculture Study

Purpose: Evaluate conventional management with IPM management techniques

Contact: Christian Krupke, Entomology

Soybean Aphid Suction Trap Network

Purpose: Monitor flight of soybean aphids.

Contact: Christian Krupke; Entomology

Insect Pest Monitoring Network

Purpose: Monitor insect pest levels of corn, soybeans and wheat.

Contact: John Obermeyer; Entomology

Cooperative Ag Pest Survey

Purpose: DPAC is used as a monitoring site for a statewide trap grid for the early detection of exotic, invasive insect pests of soybean and vegetables.

Contact: John Obermeyer; Entomology

Heliothine Research Survey

Purpose: Use DNA samples from Heliothine moths (Corn earworm) collected weekly throughout the United States to determine the phenology and distribution of a group of viruses known to infect those moths and determine how to use those viruses in IPM strategies.

Contact: Paul Baker, Bruce Webb UKY and John Obermeyer; Entomology

Department of Forestry & Natural Resources

Understanding Habitat Needs of Northern Long-Eared Bats

Purpose: Monitor activity of Northern Long-eared bats through various collection methods.

Contact: Cheyenne Gerdes, Dr. Patrick Zollner, Forest and Natural Resources

Mixed Hardwood Demonstration Tree Planting

Purpose: Demonstrate mixed hardwoods trees planted in Indiana and the effects deer have on growth and survival of the planted and voluntary trees.

Contact: Don Carlson; Forestry and Natural Resources

Wildlife Shrub Demonstration Plantings

Purpose: Demonstrate several commonly planted wildlife species and the effects deer have on growth and survival.

Contact: Don Carlson; Forestry and Natural Resources

Forest Regeneration Demonstration Area

Purpose: Demonstrate how a forest regenerates following the removal of the woody material. Supplemental tree planting of both standard and select nursery stock occurred on the sites along with fencing of half of the site to exclude impacts of deer on regeneration.

Contact: Don Carlson; Forestry and Natural Resources

Long Term Continuous Forest Inventory

Purpose: Permanent forest inventory plots have been established and maintained on most of the woodlands at Davis PAC to monitor changes in species abundance, growth, survival, and timber quality over time.

Contact: Mike Jenkins and Don Carlson; Forestry and Natural Resources

80+ years of Central Hardwood Forest Dynamics

Contacts: Mike Jenkins and Robert Morrissey, Hardwood Tree Improvement and Regeneration Center, Department of Forestry and Natural Resources