BENCHMARKING AND INTEGRATING SOIL HEALTH, WATER QUALITY AND CLIMATE-SMART FOOTPRINTS OF ILLINOIS SOYBEANS

PROJECT SUMMARY

This multi-year project will identify soil health, water quality and climate footprint best practices and metrics across regions and cropping systems (soy and double-cropped wheat, soy rotated with corn). Findings will inform practice-based recommendations that protect soil health and water quality, as well as provide insights farmers can use as they navigate carbon markets.

INSIGHTS GLEANED TO-DATE

- Awaiting 2023 final yield, greenhouse gas (GHG), leaching and soil health data following soybean harvest in late October/early November
- In-season observations:
  - Cover-cropped soybeans showed spotty germination and slower growth throughout the season, likely due to water deficit from the cereal rye cover crop
  - Double-cropped soybeans were late to germinate due to very low moisture in the top 6″ to 8″ of soil, indicating a potential risk to double-cropped soybeans in dry mid-summers with low surface soil moisture

QUESTIONS THIS PROJECT WILL ADDRESS

- What are tangible metrics across the various soybean-growing environments in Illinois that demonstrate improvements to soil health?
- How do soil health practices correlate to quantifiable improvements in water quality; soil health via biological, chemical and physical soil health tests; nutrient utilization; GHG emissions; and soil carbon sequestration?
- How do different cropping system environments (e.g., soil type) and management practices influence soybean's net carbon footprint, yield performance and net profitability?

WHY THIS RESEARCH IS IMPORTANT

- While farmers are interested in soil health, sustainability practices and carbon credit markets, they are also skeptical due to the lack of clear metrics, industry claims and data interpretation. Because of the various cropping systems and growing environments in Illinois, farmers demand more than generalizations.
- Implementing soil health practices during the soybean phase of crop rotations and quantifying how they can improve soil, water and environmental quality can help move the needle on adoption. In addition, providing tangible metrics around nutrient fixation, carbon sequestration and GHG emissions can provide farmers with a clearer picture of how to approach carbon markets.
- Establishing these metrics can empower and/or inspire more Illinois soybean farmers to adopt soil health practices, position the sustainability of Illinois soybeans in national and global markets, and lay the foundation for Illinois soybeans to capitalize on rapidly emerging carbon markets.

HOW THIS RESEARCH BENEFITS THE FARMER

- This research project is designed to deliver hard, field-based data farmers can use to inform management decisions to achieve different outcomes.
- Farmers will have a clearer view of how tillage and cover cropping practices specifically interact across the three major soil and climate regions of Illinois. This will give them insights into the potential trade-offs between soil health and yield based on tillage and cover crop practices, as well as understand when it makes economic sense (or not) to take advantage of carbon and other ecosystem credit programs.

ABOUT THE LEAD RESEARCHER

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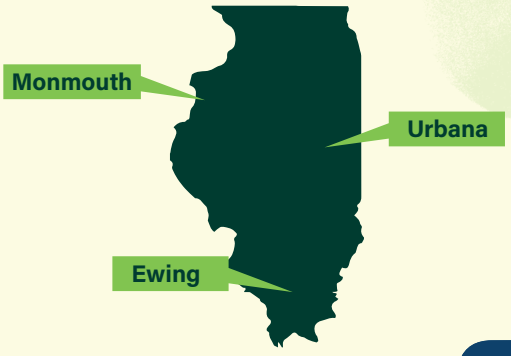
Dr. Margenot has more than a decade of experience in soil health and nutrient cycling research across agricultural systems. He leads a 40-plus person team at the University of Illinois Soils Lab, where they evaluate processes in and management of soil health, water quality, and carbon sequestration. He believes soybeans have the potential to lead the way in conservation across Illinois and the larger Corn/Soybean Belt cropping systems, specifically by serving as a leverage point for introducing conservation practices. His 2023 highlight: becoming a dad!

RESEARCH TEAM

- **Dr. Talon Becker**, *Extension Educator, Commercial Agriculture*, University of Illinois
- **Michael Douglass**, *Research Specialist*, UIUC
- **Heidi Allen Asensio**, *PhD Student*, UIUC
- **Natacha de Gracias Fuentes**, *Field/Lab Technician*, UIUC
- **Guadalupe Gonzalez Delgado**, *Field/Lab Technician*, UIUC

TRIAL LOCATIONS



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See updates and learn more about this project, the research team and other projects at ILSoyAdvisor.com and @ILSoyAdvisor on Facebook and X.

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