

QUANTIFYING CONSERVATION BENEFITS FOR ILLINOIS SOYBEAN FARMERS: EXTRAPOLATING ON-FARM TRIAL MEASUREMENTS TO COMMERCIAL FARM FIELDS THROUGH VALIDATED ALGORITHMS AND METHODS

PROJECT SUMMARY

This project will evaluate current and past trial data, as well as implement additional trials across the state, to help quantify the benefits of adopting conservation management practices so that Illinois' soybean farmers are equipped to take advantage of developing ecosystem marketplaces. Project output will include reports farmers can use to inform their management decisions and improve outcomes specific to soybean productivity, greenhouse gas (GHG) emissions, soil carbon sequestration and water quality.

QUESTIONS THIS PROJECT WILL ADDRESS

- ❓ How do conservation practices like cover crops, conservation tillage and more strategic nutrient management impact crop productivity and the bottom line?
- ❓ How do conservation practices affect soil health, water quality, GHG emissions and soil carbon sequestration?
- ❓ How can results from other locations be useful to a specific farmer when there are so many variables that influence these types of outcomes?

WHY THIS RESEARCH IS IMPORTANT

- ⚠️ Because each field is unique, it is challenging to provide farmers with data they feel is relevant to their farm and compelling enough to transition their management approach to include more conservation practices.
- ⚠️ Through this research, the goal is to translate on-farm trial measurement results into quantifiable guidance that farmers can use as they make management decisions for their commercial fields.

HOW THIS RESEARCH BENEFITS THE FARMER

- 🎯 By generating quantitative estimations of how conservation management practices impact crop productivity, GHG emissions, soil carbon sequestration, and nitrogen leaching, farmers will be equipped with field-level, yet scientific, data they can use in their decision-making process.
- 🎯 The resulting data will also help farmers determine how they can engage in the developing ecosystem marketplaces, such as a carbon credit market.

ABOUT THE LEAD RESEARCHERS



DR. KAIYU GUAN

Associate Professor, University of Illinois Urbana-Champaign (UIUC)

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With expertise in remote sensing, modeling, forecasting, supercomputing and agricultural sciences, Dr. Guan applies this knowledge to research that advances modeling and remote sensing capabilities for the agricultural industry. His goal is to use these tools to help address challenges such as large-scale crop monitoring and forecasting, water management and sustainability. When he's not working to solve ecosystem challenges, you might find him rooting for the Chicago Bulls or enjoying sushi and steak.



DR. BIN PENG

Assistant Professor, University of Illinois Urbana-Champaign (UIUC)

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Dr. Peng has years of experience developing modeling and forecasting tools related to agriculture, water quality and other environmental factors. In addition to conducting research that addresses agricultural water quality, Dr. Peng enjoys engaging with farmers and other stakeholders and teaching classes related to agricultural water quality. His top-five favorite foods are tofu, hot pot, kimchi, smoked rib tips and cola chicken wings.

RESEARCH TEAM

- **Dr. Andrew Margenot**, Associate Professor, UIUC
- **Ziyi Li**, PhD Student, UIUC

TRIAL LOCATIONS

- **Leveraging existing ISA-funded research sites through Dr. Andrew Margenot's project, *Benchmarking and integrating soil health, water quality and climate-smart footprints of Illinois soybeans***
- **40 farm fields across Illinois to be recruited in 2024**
- *If you are a farmer or landowner interested in participating in this study, please email Dr. Kaiyu Guan*



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See updates and learn more about this project, the research team and other projects at [ILSoyAdvisor.com](https://ilsoyadvisor.com) and [@ILSoyAdvisor](https://www.facebook.com/ILSoyAdvisor) on Facebook and X.

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