

Conservation and Crop Insurance Research Pilot

Status Update | October 2021

Background

The Conservation and Crop Insurance Research Pilot is a collaboration between AGree, the University of Illinois at Urbana Champaign, and USDA to analyze data from six states—Indiana, Illinois, Iowa, Missouri, Minnesota, and South Dakota—to better understand how use of cover crops and tillage practices affected corn and soybean planting dates, the number of prevent plant acres, and crop yields in the extremely wet spring of 2019. That year, there were 19 million acres of cropland that were not planted due to wet conditions and had prevent plant insurance claims costing over \$4 billion. Specific research questions to be addressed in the pilot study include:

1. How did cover crop and tillage practices, particularly where used for multiple years, impact the timing of planting for commodity crops on selected fields in 2019?
2. How did cover crop and tillage practices, particularly where used for multiple years, impact whether a commodity crop was planted or whether the field was declared “prevented plant” for 2019?
3. How did cover crop and tillage practices, particularly where used for multiple years, impact yield-related insurance claims on selected fields in 2019?

Progress

The research team at the University of Illinois at Urbana Champaign, led by Dr. Bruce Sherrick, is currently working to process and combine data from satellite image sources, the Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), and Risk Management Agency (RMA). As they conduct this work, the team is tracking data consistency challenges, uniformity of USDA reporting systems, and process insights for USDA and researchers who may be interested in conducting similar analyses in the future. Process insights and challenges encountered by the research team thus far include:

- **Scale and organization of data:** The research team is working to verify and link millions of datapoints from different sources associated with different time periods and differing treatment of locational boundaries. The scale of the data and the database layouts require complex management and design for identification purposes.
- **Identifying unreported conservation practices:** One challenge is controlling for cases where conservation practices were implemented through other sources and not tracked by USDA. To solve this issue, the research team is training the models on sample data and other sources of data where conservation practices were reported (such as satellite image analysis), and to verify areas where it is believed conservation practices were implemented but not reported.

- **Time:** Another challenge in organizing datasets from different USDA agencies is that datasets are associated with different time scales. Through time, annual RMA policy data, FSA production data, and NRCS conservation implementation data can relate to different parcels in a single operation complicating the ability to identify temporal relationships at a field level.
- **Common Land Units (CLUs):** CLUs are not standardized across datasets. The research team is using a particular, normalized version of CLUs and subfields to create consistency in treatment of effects.
- **Weather data:** Weather data are not normally available for individual fields and are not associated with specific CLUs. A novel solution of downscaling in-year PRISM data is being completed to better match up weather data with specific fields.
- **Field history:** The research team is working to verify Crop Data Layer information against field boundary information across each source of data to ensure proper treatment in cases of missing or omitted production data.
- **Protecting privacy:** Farm data is being handled in a completely secure process by the University of Illinois research team, with protocols in place to guarantee all field data is handled in an anonymous fashion. Individual identifiers are stripped out of all data and only aggregate numbers for broad geographic areas will be reported on as part of the research process.

The research team is managing these challenges through modeling and analysis techniques that will be documented and shared for future researchers to reference. The combination of this number and scale of datasets for this type of analysis is unprecedented. These preliminary insights, in addition to the results, are valuable to understand how USDA and other researchers can conduct further research on climate-smart agriculture.

Outcomes

The pilot will be completed in early 2022. It is expected the research results will be summarized in a joint publication between the University of Illinois and USDA and submitted to an academic journal for peer review and publication. Other summary documents will be prepared for USDA and for the general public about the results of the research.

The results of the pilot will inform the delivery of conservation technical assistance to farmers by evaluating the effects of conservation practices, particularly cover crops and no-till, on risk management. The pilot is intended to further agency missions by demonstrating how USDA datasets across multiple agencies in conjunction with other available third-party data sets can be analyzed together to unlock important new insights about conservation activities and risk management. In addition, the pilot is intended to discover how datasets across multiple USDA agencies work together, and where useful data is missing, which can inform USDA's efforts to improve data collection, integration, and analysis.