

Mapping Soybean Protein and Oil Quality in Farmer Fields

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Overview of Project Objectives

The agronomic and management determinants of soybean seed quality and composition are gaining attention among farmers, agronomists, and commodity traders. Genetic and production efforts to improve nutritional composition of U.S. soybeans will provide a competitive edge for increased economic value. Creating awareness and generating relevant data about in-field soybean quality variation supports the goal of increasing U.S. farm competitiveness in global and regional niche markets. This work will expand knowledge of soybean protein and oil quality in farmer fields across the North Central region. The third year of the project includes developing one of the largest soybean quality databases globally through a 10-state collaboration. In addition to soybean seed quality analysis, relevant management data from farmers will be collected to refine future investigations and management recommendations focused on improving soybean quality across the country.

Key Results

Complete datasets on soybean seed quality and relevant crop management has been collected on a total of 394 fields across the U.S. Information obtained from southern states (Louisiana, Mississippi, and Alabama) was supported by the United Soybean Board. The team expects to have the largest dataset on in-field soybean quality variation across the North Central and other soybean growing regions. Yield and management data collected through a farmer survey were combined with growth models to summarize weather data during key crop development stages. So far, the prediction models for yield and oil concentration exhibited greater accuracy than protein concentration when variables related to weather, soil, and crop growth were considered. Yield, protein, and oil levels were within the ranges usually reported in the regions explored. However, higher protein levels in the north suggest a narrowing in the quality gap of soybeans between north and south.

The group has also developed the Soybean Quality Economic Simulator, which farmers can use to predict the return-on-investment for oil and protein quality in their soybean fields. Users of the tool can estimate savings or additional costs for growing soybeans with an associated premium for oil and protein, such as increased seed and planting costs or reduced financing options for inputs. The simulator allows farmers to estimate total financial gain or loss of implementing a practice and can help ensure that all costs are considered before implementing a new practice.

Benefit to Farmers

This project will provide relevant information to growers related to soybean oil and protein quality at the field level and a decision tool with the ultimate outcome of improving overall profits from soybean cropping systems.

Links

[Mapping Soybean Protein and Oil Quality in Farmer Fields](#)

USB National Soybean Checkoff Research Database

[Planning for the Future: Mapping Soybean Fields for Protein and Oil Quality](#) - SRIN article