SOYGEN2: Increasing Soybean Genetic Gain for Yield and Seed Composition by Developing Tools, Know-how and Community Among Public Breeders in the North Central U.S.

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Overview of project objectives

The SOYGEN2 (Science Optimized Yield Gains across Environments) project has four main objectives to enhance soybean yield gains (genetic gain) and seed composition. The team is working to add value to the Northern Uniform Soybean Trials (NUST), which have been conducted since 1941. They will add GPS coordinates to NUST to access environmental data, and add genotypic data to the NUST and to the SCN Regional Trials. The second objective focuses on the development and use of high-throughput genome-wide genotyping technologies and making these tools widely available. Objective three will evaluate different breeding methods that target one or more areas of trait improvement such as yield and seed protein content. Breeders will test methods to determine which are most viable to improve genetic gains. The fourth objective is to complete the evaluation of diverse soybean genotypes from the USDA Soybean Germplasm Collection to obtain high-quality phenotype and environmental data that will contribute useful agronomic and quality traits to soybean breeding lines and commercial varieties.

Key results

A database framework for agronomic, environmental, genotypic, meta and other trait data from previously collected trials has been generated and made available through Soybase. The implementation of Breedbase has been installed and is being tested. All data that have been uploaded to the databases are sharable with participating breeders. For objective three, comparative selection sets for three breeding programs have been made, for a total of five breeding programs; and advancements to the F4 generation were made. While substantial tools and materials were developed, yield and protein seed data will need to be evaluated for the success of the methods.

Benefit to farmers

This work leverages and builds upon ongoing and previous work by developing tools, know-how and community among public breeders. The results will lead to faster development of improved soybean cultivars, which will provide farmers with increased production and profitability.

Links

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