Increasing soybean genetic gain for yield by developing tools, know-how and community among public breeders in the North Central US

Funding: $666,514

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Overview of project objectives

The project has four main objectives to enhance gains for yield and seed composition in soybeans. First, the team will develop a breeding database that will be housed within SoyBase.org, the current repository for soybean genetics and genomic data. The team will also add environmental and genotypic data to the Northern Uniform Soybean Trials, which dates back to 1941. The second objective is focused on the development and use of low-cost genotyping technologies with high-quality marker data; and making tools available for genomic data management that integrates genomic data with phenotypic data in a user-friendly form. 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 follow up and complete the evaluation of diverse soybean genotypes from the USDA Soybean Germplasm Collection to obtain high-quality phenotype and environment data.

Key results

A new interface for the Northern Uniform Soybean Trials data has been developed. Work is being done to streamline a genotyping service for the public soybean breeding sector at costs low enough to afford genomic selection on a wide scale. For Objective Three, the team has collected or is collecting tissue samples, which could equal up to thousands of samples, and are sending them to the Hyten lab for genotyping.

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 include greater genetic gains in soybean for yield, as well as any other targeted trait. This will translate to improved cultivars that will achieve higher yields and higher quality.

Links

Increasing Soybean Genetic Gain for Yield by Developing Tools, Know-how and Community Among Public Breeders in the North Central US *USB National Soybean Checkoff Research Database*