Science Societies

USDA core collection of common bean needs to be updated

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Two undergraduate students work in the Gepts Laboratory at the University of California–Davis. Photo courtesy of Paul Gepts.

Gene banks like the one the USDA operates for the USA maintain collections of crop genetic diversity. These collections are crucial to assure the resilience of our crops

when faced with changing conditions like global warming, the introduction of new pests, and new consumer preferences.

Some of these collections—like the common bean collection—are quite large, which makes a comprehensive initial evaluation more difficult. One solution for this conundrum is a Core Collection, which would represent 5–10% of the entire collection. The common bean core collection of the USDA was one of the first to be established in the early 1990s.

In a recent article published in *Crop Science*, the content of this core collection was evaluated using our current knowledge of common bean crop diversity. Analyses of DNA diversity data, seed type information, and phaseolin seed protein data showed that several gene pools of common bean were either underrepresented or absent in the core collection.

The researchers recommended, based on these results, the development of a separate core collection for wild common bean and specific additions to the core collection of domesticated types. Specialized core collections can be developed that address specific constraints like disease or drought stress, cooking time, and human nutrition traits.

Dig Deeper

Kuzay, S., Hamilton-Conaty, P., Palkovic, A., and Gepts, P. (2020). Is the USDA core collection of common bean representative of genetic diversity of the species, as assessed by SNP diversity? *Crop Science*, *60*.
https://doi.org/10.1002/csc2.20032

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