Science Societies

# Computers Learn to Predict Yield the Same Way Plant Breeders Do

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*Hongyu Jin, a Ph.D. student at the University of Nebraska, visually examines a tropical corn variety and concludes it is poorly adapted to grow in Nebraska. Photo by James Schnable.*

The early selection stages in crop breeding programs play a critical role in determining how successful plant‐breeding efforts will be. The cost of genotyping each early‐stage variety makes genomic prediction inaccessible to many public breeding programs as well as those in developing countries. Phenotypic prediction models use observations of non‐yield traits to predict crop performance, similar to the visual evaluation approach employed by highly experienced breeders. This alternative may offer a cost‐effective solution.

Researchers conducted field trials on 752 maize genotypes in two different environments in Nebraska and Michigan to compare these methods. They developed and trained a phenotypic prediction model to predict yield from a modest number of manually scored plant traits and found that phenotypic prediction using hand‐measured traits matched or exceeded the performance of genomic prediction models.

This study suggests that phenotypic prediction could be widely adopted by breeding programs with limited resources to augment the declining number of working plant breeders and enhance the performance of crop‐breeding programs.

**Adapted from**

Jin, H., Tross, M. C., Tan, R., Newton, L., Mural, R. V., Yang, J., Thompson, A. M., & Schnable, J. C. (2024). Imitating the “breeder's eye”: Predicting grain yield from measurements of non-yield traits. The Plant Phenome Journal, 7, e20102. https://doi.org/10.1002/ppj2.20102