Science Societies

Evaluation of winter wheat hybrids in Texas

February 26, 2020

Anil Adhikari, lead author of the article, checking hybrid seed set on field crossing blocks in Gree

Anil Adhikari, lead author of the article, checking hybrid seed set on field crossing blocks in Greenville, TX. The white cloth bags in the plots are to check selfing rate in female plots.

Wheat annual yield gains have not been rapid enough to meet projected future global wheat production needs. Hybrid wheat breeding represents an opportunity to address this need and enhance yield stability in marginal environments by increasing yield 15 to 20% compared with pureline cultivars.

In the U.S. Great Plains, hybrid seed is expensive and does not provide a sufficient yield advantage to offset its cost, despite efforts by public and private breeding programs since the 1960s. In an article recently published in *Crop Science*, researchers from Texas A&M and the University of Nebraska–Lincoln (UNL) reported hybrid yield advantages as much as 20% over purelines. Experimental hybrid seed was produced by crossing elite lines from Texas A&M and UNL wheat breeding programs using

chemical hybridizing agents in field crossing blocks. About 700 experimental hybrids were tested across three locations in Texas in 2016 and 2017. The highest-yielding hybrids produced 20.4 and 6.2% more grain than the best commercial cultivars in 2016 and 2017, respectively.

These results demonstrate the yield advantage of winter wheat hybrids over purelines in Texas. However, commercial success of hybrid wheat depends on continued research investment for wheat-breeding efforts to delineate heterotic groups, maximize heterosis, and develop reliable and cost-effective methods of seed production.

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Adhikari, A., Ibrahim, A.M., Rudd, J.C., Baenziger, P.S., & Sarazin, J.-B. (2020). Estimation of heterosis and combining abilities of US winter wheat germplasm for hybrid development in Texas. *Crop Science*, *60*.
https://doi.org/10.1002/csc2.20020

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