Science Societies

Three new and improved long-grain rice germplasm lines

April 16, 2025



Panicles from field-grown rice germplasm CS272, one of the three lines developed in this study, in Arkansas. Photo by Heather Box.

The rice industry in the United States faces challenges including marketable price, reduced milling quality, and the lethal blast disease caused by the fungus *Magnaporthe oryzae*. Rice farmers in the southern U.S. spend millions of dollars annually on the pesticides to control rice blast, increasing production cost. Rising temperatures, in particular higher nighttime temperatures during grain filling, increase chalkiness, or the amount of opaqueness in a grain of rice. This negatively impacts milling quality and head rice yield, the percentage of whole kernels obtained after milling.

To solve these problems, scientists at the USDA-ARS Dale Bumpers National Rice Research Center, the University of Arkansas Rice Research and Extension Center, and Louisiana State University developed three rice germplasm lines with low chalk, improved yield components, and blast disease resistance. These germplasm lines, designated as CS272, CS324, and CS353, were selected from 900 progeny of two U.S.-adapted long-grain premium rice varieties Cybonnet and Saber. The team also developed user-friendly genetic markers for the blast resistance gene *Ptr* to use in marker-assisted selection.

These improved germplasm lines may help rice breeders accelerate the development of rice varieties with improved yield, good milling quality, and blast disease resistance. These improvements will allow farmers to grow rice without fungicides and will benefit producers, millers, and consumers.

Dig deeper

Jia, Y., Gibbons, J., Jackson, A. K., Box, H., Zhao, H., Wang, X., Jia, M. H., Famoso, A., & Groth, D. (2025). Registration of three long grain rice germplasm lines containing improved blast resistance with the *Ptr* gene, low chalk, excellent milling quality, and good yield. *Journal of Plant Registrations*, *19*, e20407. https://doi.org/10.1002/plr2.20407

Text © . The authors. CC BY-NC-ND 4.0. Except where otherwise noted, images are subject to copyright. Any reuse without express permission from the copyright owner is prohibited.