ARS releases heat-tolerant beans

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New bean germplasm lines containing heat, drought and disease tolerance are being released by Agricultural Research Service (ARS) scientists and cooperators.

ARS geneticist Tim Porch, with the agency's Tropical Agricultural Research Station in Mayagüez, Puerto Rico, has recently released two new kidney bean germplasm lines, named TARS HT-1 and TARS HT-2, that are tolerant to high temperature conditions. These new releases are part of collaborative breeding efforts with Cornell University, the University of Tennessee and the University of Puerto Rico.

TARS HT-1 yields well under high day and high night temperature stress, and TARS HT-2 performs well under high day and moderate night temperature stress. These germplasm lines can improve yields under hot summer conditions for farmers in regions prone to high temperature stress. They can also be used to improve heat tolerance in other large-seeded beans through breeding and selection.

Porch and university colleagues are also developing new black bean germplasm lines with tolerance to heat and drought and resistance to root rot and common bacterial blight. Common bacterial blight disease is caused by the bacterium *Xanthomonas axonopodis pv. phaseoli* and thrives in hot, humid climates. It primarily attacks the leaves and pods of bean plants and causes significant losses in both yields and seed quality. Root rot is caused by a complex of fungal diseases and is present in most common bean production zones worldwide.

Porch crossed tropical black and red beans to produce the new black bean germplasm lines, which are adapted to temperate areas, helping to increase the diversity of U.S. bean germplasm. Field and greenhouse trials in Nebraska show the lines yield well in addition to possessing drought tolerance and disease resistance.

According to Porch, the beans he and his university collaborators are testing have broad adaptation. They do well in the short days common to Puerto Rico and the long days found in the continental United States.

More information: Read more about this research in the May/June 2010 issue of Agricultural Research magazine, available online at: www.ars.usda.gov/is/AR/archive/may10/bean0510.htm

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