

Scientists identify genetic resistance to rice sheath blight

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Agricultural Research Service (ARS) scientists have identified sources of genetic resistance to sheath blight, a major disease affecting rice production worldwide.

Sheath blight, caused by the fungus *Rhizoctonia solani*, is a major disease of rice that affects yield and grain quality. Geneticist Anna McClung, director of the ARS Dale Bumpers National Rice Research Center in Stuttgart, Ark., and research leader of the Rice Research Unit in Beaumont, Texas, heads a group of ARS scientists examining the <u>rice</u> <u>genome</u> in search of genetic resistance to this serious disease.

Plant pathologist Yulin Jia and colleagues at Stuttgart had a breakthrough in their sheath blight mapping efforts when they identified and confirmed qShB9-2, the first genetic region they have found to have a major effect on controlling the disease.

In a related project, geneticist Georgia Eizenga at Stuttgart screened 73 wild rice species for signs of sheath blight resistance. Seven accessions showed promise, and Eizenga's team has crossed some of those accessions with domestic varieties to create new, resistant germplasm.

The Stuttgart scientists have also developed a standardized screening technique to help quickly and accurately detect sheath blight in seedlings. Called the "microchamber method," this technique uses 2-liter or 3-liter plastic bottles to create a humidity chamber to promote disease development. This allows the researchers to measure seedlings' disease



reaction in just seven days, accelerating the process of identifying novel, resistant sources from cultivated and wild relatives of rice.

Meanwhile, in Beaumont, geneticist Shannon Pinson has been studying gene-mapping populations from recombinant inbred lines (RILs) of domestic rice cultivar "Lemont" and Chinese cultivar "TeQing." She found 18 <u>chromosomal regions</u> in these RILs with genes that can help <u>rice</u> plants resist damage from sheath blight, including the qShB9-2 genetic region confirmed by Jia. Two of the regions have shown a large, measurable effect on sheath blight resistance.

The scientists' studies can be found in *Plant Disease*, *Molecular Genetics* and Genomics, Frontiers of Agriculture in China, Theoretical Applied Genetics, Crop Science, Phytopathology and the Journal of Plant Registrations.

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