

Rice Bacterial Panicle Blight In The Southern United States

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Bacterial panicle blight has been observed increasing in rice production fields in Arkansas and other southern states since 1995. The disease is favored in summers with hot nights and thought to be primarily seed- and possibly residue-borne, and can cause up to 60% yield loss under favorable environmental conditions like 2010 and 2011 in Arkansas. During the past two summers in our state, yield reductions caused by bacterial panicle blight were up to 50% as the disease has been a serious problem in other southern states including Louisiana, Texas, Southeast Missouri and Mississippi. Symptoms develop late in the season on the panicles which makes predicting its occurrence difficult.

Although bacterial panicle blight of rice has been reported to be caused by more than one bacterial plant pathogen, we have isolated *B. glumae* most frequently from infested rice fields. Recently, bacterial panicle blight has been considered the top priority disease in Arkansas because of the serious yield losses experienced and that no reliable management options are at hand. Further complicating matters, the disease cycle is not fully understood under our conditions and chemical control options, while used in Asia, have not been registered in the U.S. Current fungicides used on rice in the U.S. have no activity on bacterial panicle blight and the development of antibiotic resistance in Asia to products there have fostered concern about development and use here.

There are no dependable cultural management options, although reducing the nitrogen amount applied has been observed to reduce disease severity but these observations require further investigations. The disease also appears to increase in fields where rice plants have been under stress, although specific factors have not been well researched. In 2010 in Arkansas, the disease appeared to be more severe in rice after rice fields and we do not know how long the bacteria may survive in the soil or residue. Dispersal of the pathogen in rice fields is also not well

understood. The role of stink bugs or other panicle active insects or mites in pathogen dispersal needs investigation. Although planting early has been considered to likely help the plants escape the disease, it may be effective only if the hot weather comes later in the season and this also needs further investigation.

Like most other diseases, growing bacterial panicle blight resistant rice varieties is a user- and environmentally friendly way of managing the disease. However, most varieties that are available commercially are susceptible under favorable conditions with the exception of 'Jupiter' and hybrid rice cultivars. 'Jupiter' has only partial resistance indicating the disease may not be fully controlled and resistance in the hybrids is



not understood. LSU Ag Center scientists and have been working towards various management options and resistance development.

Understanding the spread of the disease, its complexity, and the urgency for management options, the University of Arkansas Division of Agriculture has launched a research program with special emphasis on bacterial panicle blight. We are working primarily on chemical and non-chemical seed treatment options for short-term management options and on developing effective resistance screening techniques for discovery and development of durable resistance in high yielding rice cultivars. Δ

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