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K-State, USDA Scientists Working to Protect Wheat Crop from Deadly Disease

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Barbara S. Valent

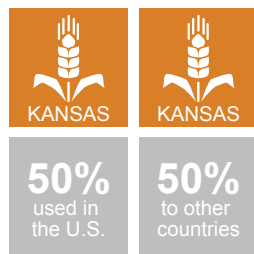
K-State, USDA Scientists Working to Protect Wheat Crop from Deadly Disease

Wheat Blast Research Conducted in University's Biosecurity Research Institute

Kansas Wheat by the Numbers



Kansas typically grows nearly one-fifth of all wheat grown in the U.S.



Half of Kansas-grown wheat is used in the U.S.; the other half is exported to other countries.



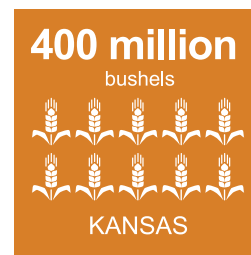
About 8.8 million acres of wheat are planted in Kansas.



Kansas ranks first in the nation in flour milling, wheat gluten production and wheat stored.



Roughly one-third of Kansas's 63,000 farmers grow wheat.



Kansas farmers typically produce about 400 million bushels of wheat a year.

Kansas State University researcher Barbara Valent is in preventive strike mode.

Valent, a university distinguished professor of plant pathology, is leading a team of K-State and government scientists who are working to find ways to protect Kansas and U.S. wheat fields from the deadly disease known as wheat blast.

“This disease spreads quickly. It has not been found outside South America, but if we don’t prepare by learning and educating others about detection, and look for ways to curb it if it does strike the U.S., the consequences could be enormous,” she said.

First discovered in Brazil in 1985, the fungus has since been found in Bolivia, Paraguay and Argentina. Valent said 2009 was a particularly bad year, with the disease cutting production in Brazilian wheat states by 25 to 60 percent.

“Our goal is to identify resistant varieties,” she said. “We’re also developing tools for rapid detection and accurate diagnosis of the pathogen, and we’re establishing training resources and a web-based network to facilitate diagnosis and distribution of resistance resources.”

Because the disease has not been found in North American wheat, it is crucial that the team’s research be conducted in a secure facility. For that reason the researchers are working in K-State’s Biosecurity Research Institute, a facility that provides scientists with a safe and secure location to study high-consequence pathogens.

“Part of our goal is also to train students to work in this environment. Work with emerging diseases in biocontainment labs is an important part of this project,” she said.

Other principal investigators on the team include K-State plant pathology professors Bill Bockus and Jim Stack and U.S. Department of Agriculture-Agricultural Research Service scientists Gary Peterson and Kerry Pedley. Pedley and Peterson are based at Fort Detrick, Md.

The project is funded by a \$999,688 grant from the USDA’s National Institute of Food and Agriculture.

At stake, in Kansas alone, is a crop that over the last several years has been valued at \$1.3 billion to \$1.7 billion a year, according to K-State agricultural economist Dan O’Brien.

“It is not clear if wheat blast would survive in the Kansas climate,” said Valent, who along with USDA’s Peterson, traveled to Brazil in May 2010 to give a presentation at an international conference focused on the disease. They were the only two representatives from the U.S. at the conference.

So far the research team has studied 72 varieties of wheat that are grown in Kansas to determine how they respond once infected with wheat blast. In that way, they can determine which are the most resistant and which are the most vulnerable.

“Because the symptoms of wheat blast closely resemble those of a common disease in U.S. wheat called head scab, it is imperative for producers to be able to tell the difference,” Valent said.

The researchers are working together with scientists in K-State’s Integrated Genomics Facility to obtain the fungus’s genome sequence, which is important for identifying the genes involved in wheat infection.

Because outreach and education are important components of the project, the research team has met with representatives of the Kansas Wheat Commission, Kansas Department of Agriculture, USDA’s Animal and Plant Health Inspection Service, and other K-State faculty. More workshops, webinars, extension fact sheets and other educational efforts are planned.

By Mary Lou Peter, K-State Research and Extension