



### **Fourth Annual Soybean Rust Symposium includes some bombshells**

The American soybean industry has changed dramatically since soybean rust was found on our shores in late 2004 – and so has our understanding of *Phakospora pachyrhizi*, the fungal pathogen that causes the disease.

Five years after soybean rust was discovered in Louisiana, more than 130 scientists at the American Phytopathological Society's Fourth National Soybean Rust Symposium in December shared both good and bad news:

- Farms in the United States have not been devastated like those in Brazil, though 2009 saw the first major economic losses to soybean rust in hard-hit fields in Mississippi.
- The sentinel plot network has successfully tracked known locations of soybean rust every day since that first discovery, but funding cuts in 2010 are leading to a scale-down of the system.
- An array of fungicides were registered and put to good use controlling soybean rust, but reports from Brazil indicate the soybean rust fungus may be getting more tolerant of the triazole class of fungicides in some areas.
- Some populations of kudzu are resistant to soybean rust, but the amount of infected acreage of kudzu that serves as a spore bank has been growing steadily.
- Geneticists are gaining an understanding of how some plants defend themselves against the fungus and are isolating genes breeders can cross into commercial varieties, but they point out that resistant varieties will not be a silver bullet for managing the disease.

### **Marking a Shift**

Presenters at the symposium shared insights on soybean rust at scales ranging from electron microscopy to field maps to diagrams of global weather patterns.

Colleagues teamed up across state boundaries, interagency lines and scientific disciplines to tackle this once feared soybean disease from all possible angles, generating a remarkable amount of new information. Symposium chairperson Anne Dorrance of The Ohio State University pointed out that since 2004, participants have published 170 peer-reviewed papers in European and American publications, including 63 articles in American Phytopathological Society journals, on soybean rust.

“This is a celebration of accomplishment,” Dorrance told the group at the symposium’s opening session on December 9, 2009, in New Orleans, La. “There has been a tremendous amount of research and sweat and driving hours and laboratory bench hours. We have focused a lot of brainpower on *P. pachyrhizi*.”

The effort to understand and manage soybean rust is by no means over, but the 2009 symposium marked a shift in tone for the group, notes David Wright, director of research for the North Central Soybean Research Program, and technical chairperson of the symposium.

“We’ve gone from the fearing this disease to being confident we can manage it if it becomes a problem,” he explains.

Progress on soybean rust will continue as researchers fine-tune models that will help predict disease outbreaks and their economic costs, develop resistant soybean germplasm, identify and track genetically distinct populations of the fungus, create diagnostic tools for field use, and learn more about how environmental factors affect the disease.

### **Sentinel Changes**

Among the biggest changes growers will see in the coming year is a scale-down of the Sentinel plot system that has covered the nation’s soybean producing areas since 2005 with meticulously scouted soybean plots and spore collection equipment. With the end of federal grants that have supported the system, funding will drop 60 to 80 percent in 2010 compared to its 2006 to 2008 peak, says Don Hershman, extension plant pathologist at the University of Kentucky, who coordinated the first four years of the Sentinel effort.

The nationally funded network will cover the South from Texas and Oklahoma to South Carolina for the 2010 season; monitoring in the North will need to be covered by other sources of funds. Sentinel plot monitoring in the South will be conducted from April 1 through October 15 instead of year-round. And to streamline reporting, Sentinel scouting teams will not report negative data – they will only upload reports when they find soybean rust spores. The result will be a leaner system that will still safeguard the country's soybean acres.

“From a Northern perspective, we only need to know where soybean rust is from about April 1,” Hershman says. “The South is where the main event is. If things begin to change, if models indicate there could be a problem in Illinois or Iowa, there will be ad-hoc monitoring. No soybean specialist will drop the ball on this.”

### **Grower Commitment**

The Sentinel plot system is a monument to soybean growers' commitment to staying ahead of soybean rust, Hershman points out.

“We recognized this was a major disease, but more important than that, growers demanded it,” he says, recalling a 2005 meeting of USDA researchers, extension specialists and growers. “They wanted a national, systematic monitoring program. We were given our marching orders.”

Support for the system directed Northern money to Southern states in a unique effort to protect the entire industry, adds Wright. “The credit goes back to the farmers,” he says. “It was the farmers who were determined to get the sentinel plot system operational within months, not years. It was the farmers who funded research at the University of Florida so scientists could study the disease year-round. You go where the problem is to conduct the research, knowing you'll be ready when it shows up on your doorstep. Farmers supplied the financial support, and an incredible group of scientists did a tremendous amount of work.”

The plots paid off handsomely – both in the value of the data they provided on how soybean rust moves and in the estimated \$200 million growers have saved each year by avoiding unnecessary sprays or making properly timed treatments when needed, says Wright.

Checkoff investments in the soybean rust battle will continue to show returns, Wright predicts. If a “perfect storm” of spores and weather sets the stage for Midwestern outbreaks, or the pathogen’s population shifts to a more Midwest-adapted race, growers will be prepared. And the successful model of coordinated effort can be emulated in the future.

“This communication/facilitation model has been expanded to deal with other pathogens and diseases,” he says, “to try to keep research and knowledge moving forward and help farmers remain profitable.”

*The Plant Health Initiative represents a cooperative partnership between soybean checkoff boards and land grant universities from 12 north central states. The initiative’s goal is to act as a resource that collects and dispenses valuable management information on a variety of soybean pests and diseases. The Plant Health Initiative receives its funding through soybean checkoff dollars, and is administered by the North Central Soybean Research Program (NCSRP), its primary sponsor. Funded by the soybean checkoff.*