

As soybean rust lurked just beyond the United States' border during the summer of 2004, a diverse group of university, government and industry scientists had been busy for over a year designing a strategy to fight it once it moved into the US. A disease that had decimated soybean fields in Africa, Asia, and South America, soybean rust spread quickly once it had a foothold and often struck with little warning. In early November 2004, soybean rust was detected in Louisiana—the first finding in the continental United States. Experts have commented that spores may have been blown in with Hurricane Ivan six weeks earlier.



Kentucky stands squarely in the path between the Gulf States where soybean rust survives the winter and 60 million acres of soybeans pro-

duced in the North Central and Northeast regions of the United States. By the time the disease arrived in Kentucky in October 2006, the University of Kentucky had already been an active part of the soybean rust sentinel network for nearly two years.

"We're a gateway to 60 million acres of soybeans, so soybean producers north of Kentucky look with great interest at what happens here," said Don Hershman, Extension plant pathologist with the University of Kentucky. "I've been involved in the coordination of the network from the beginning to get as close to the source of the information as possible."

As the soybean rust sentinel network began forming into the Pest Information Platform for Education and Extension (PIPE) during 2005, Hershman became involved in its development. A major goal of the PIPE was to develop a website integrating information from several different soybean rust modeling systems, and communicating disease distribution maps and updates logged by a network of extension specialists from 35 states and Canada.

"The PIPE is about making available some of the best information that is generated and archived regarding the distribution and extent of soybean rust," Hershman said. "The website is supposed to be a one-stop shopping place for growers to access essential information needed to manage soybean rust.

If that didn't exist, with all of the various websites out there, it could have resulted in an information free-for-all."

Funds to monitor soybean rust come from USDA's Risk Management Agency and from soybean check-off sources. Soybean rust is monitored in an extensive network of plots (called sentinel plots) that are scouted for soybean rust every week to two weeks during the growing season. The intent is for sentinel plots to serve as an early warning system, so the alarm can be sounded before the disease strikes commercial soybean in a state. Hershman said that everyone who has an interest in the soybean industry—from the growers and grower groups to Land Grant Universities to agribusiness groups—play a part in the network. Thirty-five states and three Canadian provinces make up the network, and each of those states or provinces has a person designated to coordinate the local network and be responsible for entering data into the system during the season. An immediate notice goes out to stakeholders when soybean rust is discovered, and a map on the PIPE website is updated to reflect each new find.

In addition to centralizing soybean rust information into one place, the PIPE proved its value in the US economy—the information network saved about \$299 million in unneeded pesticide applications that growers had originally planned to fight the disease. The soybean rust PIPE played a major role in preventing widespread panic about the spread of the disease.

Learning how to monitor for the disease has been a learning experience in itself, Hershman said. In 2005, the first year of monitoring, Kentucky established 42 sentinel plots. Last year, we had 22, almost half of the number from the previous year.

"During the second year, we realized how to monitor for soybean rust more efficiently," said Hershman. "We realized that the number of plots could be reduced without fear of missing the disease."

Scouting also takes significantly less time than it did originally. During the beginning of the first year, people scouting the fields would collect leaves and look at them while in the field to try to determine if soybean rust was present. While they still collect leaves, most observations and analysis are now done in Plant Diagnostic Network labs. Most times, samples are incubated for two days and then in-

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spected under a microscope for visible signs of soybean rust. In instances where visual observation cannot confirm or deny soybean rust, Hershman said, lab personnel run highly specific diagnostic tests on samples (PCR or ELISA) to positively identify soybean rust.

“Most Plant Disease Diagnostic Laboratories have PCR and ELISA technology, and we do too,” said Hershman. “If we’re not sure if we have soybean rust, that’s when we would use it. Running the specialized tests is expensive and time consuming, so we stick with visual identification unless absolutely necessary”

Besides functioning as one of the focal points of the PIPE network, the University of Kentucky sponsors a hotline for people to call to find out about soybean rust findings and predictions. Hershman said that people from as far away as North and South Dakota and California have called the hotline.

Hershman said that interest is still high in the PIPE system. In fact, around June, when soybean rust begins to move again in the warmer weather, he anticipates the number of hits on the website to increase, in addition to the number of calls on the hotline, an indication that the PIPE is doing its job and people trust it. The fact that the number of

questions about soybean rust has decreased 25 percent indicates that people are getting their answers either from the website or the hotlines. And that gives Hershman great relief.

“The National and Kentucky Sentinel Networks have been very effective,” he said. “I haven’t felt like we’ve missed it (soybean rust), and I haven’t gone to bed thinking that things have fallen through the cracks. I know if the folks in Alabama or Georgia say they’re not finding rust, they know what they’re talking about. The system works.”

With an increase of funding from Risk Management Agency, the PIPE is expanding its section on soybean aphid findings and broadening its scope to include other legume diseases starting in 2007. Although states will need to continue dedicating hands-on resources to the network until soybean rust forecasting models have been perfected, most would rather stay involved than to chance economic disaster.

