



CHANGES ANNOUNCED FOR SOYBEAN RUST SENTINEL PLOT PROGRAM

By Steve Werblow

Over the past five years, Asian soybean rust has been followed more closely than Britney Spears on a hot date. In fact, notes Don Hershman at the University of Kentucky, “we have not lost track of where soybean rust is in the U.S. since February 24, 2005, and we have been able to provide near-real-time data to stakeholders, along with site-specific assessment.”

But the monitoring campaign has undergone major changes in 2010. Soybean growers and researchers are settling into an uneasy peace with soybean rust, and the sprint to understand the disease has turned into a marathon to keep an eye on it during the growing season.

U.S. Department of Agriculture funds for monitoring the disease – originally \$1 million per year – have dried up completely. Allocations of checkoff dollars by the North Central Soybean Research Program (NCSRP) and the United Soybean Board (USB) will remain the same, but because that support only represents about one-third of the historic level of funding for the Sentinel system, those funds have been directed toward a picket of high-priority sites across the Deep South. Decisions are currently being made by individual state checkoff boards outside the Deep South on the level of funding support they will provide to monitoring efforts north of the pathogen’s early incursions.

Sentinel Plots

At the heart of the soybean rust tracking effort is the Sentinel plot system, a set of carefully scouted plots in more than 30 states and provinces in the U.S., Mexico and Canada. It’s been a remarkably successful effort. Reports from 696 Sentinel plots helped rust trackers locate the pathogen in 576 counties in 16 U.S. states last year, as well as three states in Mexico.

“We have routinely picked up incursions at very low levels – one leaf out of 100, maybe one or two pustules on a leaf,” notes Hershman. That’s given growers enough warning to apply a fungicide if needed, or stand down if possible. “U.S. producers saved at least \$200 million per year, mostly by not spraying, but in some cases by well-timed spraying,” Hershman calculates.

The 2010 Plan

This season, extension specialists are monitoring a full complement of nearly 700 plots under the Sentinel program. However, the plots are focused in the South, creating a tripwire across a solid band of states extending from the Texas Panhandle to South Carolina. Sentinel plot monitoring is restricted to the key part of the growing season, between April 1 and October 15. Monitoring activities outside this timeframe will be funded by local checkoff dollars.

Hershman points out reports are already coming in from cooperators along the Gulf of Mexico, indicating that the spirit of cooperation and vigilance continues even during these lean times – and that some local funding or dedicated volunteering may be starting. Still, the blanket coverage of the nation’s rust situation is in flux.

“Up to this point, it’s been a year-‘round process,” says Hershman. “We need to be prepared to lose contact with soybean rust.”

Early Action Is Key

The Sentinel plot system remains a vital tool for soybean rust management because of the importance of staying ahead of the disease’s development.

At the Louisiana State University Agricultural Center, Ray Schneider has been studying latent infections – the quiet stage of a rust outbreak in which leaves are infected but symptoms are not yet apparent. “It seems that the timing of fungicide application relative to when latent infection occurs has a lot to do with disease control,” he says. “Applications before latent infection or after first symptoms develop are less efficacious. If growers wait until after the first symptoms appear – even just one percent infection, or one pustule on 100 leaves – it’s too late to get the most effective control from an application of fungicide.”

The bottom line, he explains, is not to apply fungicides too early or too late. That makes the results of the Sentinel program, as well as additional monitoring efforts such as Schneider’s powered airborne spore collector, which processes 600 liters of air per minute to monitor and quantify wind-blown spores, especially important.

In Brazil, where soybean rust has caused \$12 billion in lost yields and control costs since 2001, national research corporation EMBRAPA’s Anti-Rust Consortium (Consórcio Anti-ferrugem) coordinates rust monitoring, notes Francisco Ribeiro do Vale of the Federal University of Viçosa in Minas Gerais State. Accredited laboratories update information about the first

incidence of disease in all soybean-producing regions of Brazil. The information is displayed on a map with details on location, date of detection, developmental stage of the crop, and the site from which it was collected, whether it was a sentinel plot, commercial field, kudzu, irrigated area, volunteer plant or research experiment.

“The occurrences are considered as a warning of the presence of the fungus in a region, and for the spray decision, this should be combined with other risk factors such as weather conditions, the stage of the crop, potential damage to the crop during the early stages of development and seed formation and local management situations of the crop,” do Vale says.

Rust has been detected in Brazil regardless of the growing season, do Vale points out. Fewer than five percent of the reports from commercial fields are described in the vegetative stage of crop growth, while 53 percent are observed in the R5 stage, he reports. As a result, fungicide applications typically begin at R1, and growers make two to four applications, depending upon the region.

New Tools

As part of the effort to help growers make timely soybean rust management decisions, growers will enjoy a new online tool that can help them decide whether a fungicide application will deliver a worthwhile return on investment.

Saratha Kumundini, formerly with the University of Kentucky, described the program to colleagues at the National Soybean Rust Symposium in New Orleans last December.

Armed with predictions from the Sentinel system and disease risk assessments developed by extension soybean disease specialists, growers will be able to input field-specific information data – including growth stage of their crop, the cost of fungicide and application, the expected price of soybeans and yield expectations. In return, the model will provide an assessment of the economic benefits of applying a fungicide for three disease scenarios: mild, moderate or severe.

Kumundini developed a model that can predict the impact of soybean rust on yields. “But because fungicides need to be applied before significant rust is present, it was necessary to provide different disease scenarios that could occur,” explains Hershman. “Growers could then use the risk assessments developed by their state’s extension plant pathologist to make a best guesstimate about which disease scenario is most likely to play out during the remainder of the season.”

Teamwork Makes It Happen

Soybean rust is unique among soybean diseases in its destructiveness and mobility. The effort to understand, track and control it has been unique in the teamwork it has sparked throughout both the grower and research community, says David Wright of the Iowa Soybean Association, who served as technical chair of the National Soybean Rust Symposium.

Control efforts by southern growers reduced spore load, protecting northern fields. Northern associations funded southern research. Universities teamed up across state lines. Money flowed into Florida – hardly a major soybean-producing state, but a great habitat to study the pathogen in an environment in which it thrives. The effort pulled in plant pathologists, agronomists, and economists, as well as scientists and equipment from as far afield as the U.S. Navy, the Department of Energy’s Joint Genomics Institute and the National Aeronautical and Space Agency (NASA).

“When we look at what happened with soybean rust, we saw action,” said Martin Draper, National Program Leader, Plant Pathology, for the USDA’s National Institute of Food and Agriculture, addressing colleagues at the national symposium. “It happened because the people in this room didn’t worry about agency lines, didn’t worry about state lines, didn’t worry about whose toes were being stepped on.

“The point is,” Draper adds, “political boundaries don’t stop these pathogens.”

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