Monitoring for Asian Soybean Rust in Alabama’s Black Belt Region

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Abstract

Four soybean sentinel plots were monitored for Asian soybean rust (ASR) at the Black Belt Research and Extension Center in 2006 and 2007. Commercial soybean fields in Dallas, Hale, Lowndes, Marengo, Montgomery, Perry, Sumter, and Wilcox Counties were also monitored for ASR. Suspect leaf samples were sent for examination to the Plant Diagnostic Laboratory at Auburn University. Farmers were informed about the monitoring and movement of ASR through various means including meetings, telephone conversations, the Auburn University Soybean Rust Hotline, and the USDA National Soybean Rust Sentinel and Monitoring Network website. In 2006, ASR was found only in Sumter County in the Black Belt Region. The disease was detected in a commercial field after harvest had been completed. As a result of the monitoring efforts for ASR in 2006, Black Belt soybean farmers did not have to spray over 12,000 acres of soybeans for the disease thus saving over $180 thousand in fungicide application costs. In 2007, ASR was found in three commercial soybean fields in Marengo, Sumter, and Lowndes counties. The disease was also detected on kudzu in Montgomery and Wilcox counties. Because ASR was found relatively early in the season, area soybeans were at risk for economic damage. Farmers were alerted to its presence and updated on the multiple fungicides available. Farmers could then make informed management decisions on whether to apply fungicides to over 13,000 acres of soybeans based on their physiological stage of their crop and their crop’s yield potential.

Objective

Early detection of Asian soybean rust (ASR) is vital in controlling this destructive fungal disease. Soybean sentinel plots and commercial fields in the Black Belt Region were monitored for ASR in an effort to provide farmers early warning to the disease’s presence and to aid in coordinating control measures.

Situation

Asian soybean rust, caused by the fungus Phakopsora pachyrhizi, has been a serious disease of soybeans in countries around the world. The disease can prematurely defoliate a plant within 4 to 6 weeks after initial infection and can cause yield losses up to 80% or more.

In November 2004, ASR was detected on soybeans in the continental United States, including Alabama, for the first time. The disease has been present in Alabama since 2004. A major concern regarding ASR is that it will overwinter on alternate hosts in areas of the Southeast that are free from killing frosts. There are at least 31 species of plants that can host the fungus including kudzu. In the spring, ASR spores could be carried northward by wind currents and storms from its overwintering sites into major soybean production areas. The fungus could be present on alternate hosts in soybean production areas before soybeans are planted.

One concern for Alabama soybean producers is that the southern part of Alabama, including part of the Black Belt Region, can have mild, frost-free winters. A mild, frost-free winter and an alternate host like kudzu could mean that the disease would already be present in our area. All these factors make detecting ASR early very important for farmers. In the Black Belt Region alone, over 12,000 acres of soybeans were grown in 2006 and over 13,000 acres were grown in 2007.

 Counties Monitored for ASR

Dallas County
Hale County
Lowndes County
Marengo County
Montgomery County
Perry County
Sumter County
Wilcox County

Key
- Scouted ASR plots and commercial soybean fields in 2006-2007
- Scouted commercial soybean fields in 2006 and 2007
- Scouted commercial soybean fields in 2007
- ASR confirmations in 2007

Extension Response

In late 2005, plans were made to have four ASR sentinel plots at the Black Belt Research and Extension Center (BBREC) in Dallas County. A regional soybean meeting was conducted in February 2006 to update farmers on soybean management practices and the ASR sentinel plots. Two ASR sentinel plots were planted at the BBREC in April 2006 utilizing Maturity Group (MG) III and MG IV soybeans. The remaining two sentinel plots, consisting of MG IV and MG VI soybeans, were planted in May. Each plot was 1250 square feet (sq ft). Plots were staked in planting dates and which in May to make sure soybeans at each physiological stage would be available for ASR infection throughout the growing season. Commercial soybean fields and kudzu patches were also monitored for ASR. Plans were made in 2006 to continue the sentinel plots at the BBREC in 2007. A regional soybean meeting was conducted in February 2007 to update farmers on soybean management practices, ASR, and the sentinel plots. In April 2007, two sentinel plots were planted at the BBREC. One plot was a MG III soybean and the other a MG IV. In May, the remaining two plots were planted with a MG IV soybean and a MG VII. Each plot was 1250 sq ft. Commercial soybean fields and kudzu patches were also monitored for ASR.

Farmers were kept informed about the monitoring and movement of ASR through various means including farm visits, telephone conversations, correspondence, the Auburn University Soybean Rust Hotline, and the USDA National Soybean Rust Sentinel and Monitoring Network website. In 2007, ASR was discussed in an August meeting because the disease was found relatively early in the season and area soybeans were at risk for economic damage. Farmers were alerted to its presence and updated on the multiple fungicides available.

Sampling Methods

Fifty (50) leaf samples were randomly collected per plot at the BBREC in 2006 and 2007. Sampling was initiated when soybean seedlings were two inches in height. Sampling occurred every two weeks until bloom. Once bloom was initiated, sampling occurred weekly. Commercial soybean fields and kudzu were scouted for ASR and were randomly sampled throughout the year. Leaf samples were sent to the Plant Diagnostic Laboratory at Auburn University for incubation and microscopic examination.

Summary

In 2006, ASR was found only in Sumter County in the Black Belt Region. The disease was detected in a commercial field after harvest had been completed. As a result of the monitoring efforts for ASR in 2006, Black Belt soybean farmers did not have to spray for the disease therefore saving over $180 thousand in fungicide application costs. In 2007, ASR was found in three commercial soybean fields in Marengo, Sumter, and Lowndes counties. The disease was also detected on kudzu in Montgomery and Wilcox counties.

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