INTRODUCTION

As of October 2005, Asian Soybean Rust (ASR) was found in two southern locations in Mississippi (MS) this year through monitoring of sentinel plots. Incidence potential was low at both sites, and the plots were destroyed. The sentinel plot program for MS began in 2004, with Mississippi State University (MSU) plant pathologists monitoring six soybean sentinel plots, as well as conducting bi-weekly surveys of kudzu and volunteer soybeans. Through these efforts, the first appearance of ASR in MS was confirmed on November 17, 2004, shortly after the first appearance of the disease in the US. Several intensive surveys revealed the presence of ASR in some counties along the MS River. Fortunately, MS harvest was 90 percent complete, and MSU plant pathologists had time to prepare for ASR in 2005. Twenty-three sentinel plots representing soybeans, kudzu, and butterbeans were established and monitored bi-weekly for ASR. Other detection measures included volunteer soybeans and S.M.A.R.T. fields. Identification of ASR was challenging because many diseases with similar symptoms occur in MS. Commonly confused diseases with ASR in MS include Septoria brown spot, bacterial pustule, and cercospora spot. Once ASR was positively confirmed, fungicide application recommendations were made to producers based on the growth stage of the crop, environmental conditions and the location and prevalence of the disease. Monitoring for ASR in sentinel plots and fungicide use will be vital to combating the disease in MS and beyond.

DETECTION

Twenty-three sentinel plots were monitored bi-weekly in 2005 by Mississippi State University (MSU) Extension and research personnel. The 1200 mile round-trip circle included the Gulf Coast, up the MS River, and up to the northeast part of the state. Each location was planted with maturity group III, early IV, late IV, and early V soybean varieties. Nineteen of the plots were planted between February 18 and March 19, and four were planted in mid-April. Kudzu, butterbeans, and soybeans in S.M.A.R.T. fields were also monitored. ASR was detected in Pearl River County on August 5th and in George County on July 18th. In Pearl River County, pustules producing ornithinicases were observed on the lower canopy of maturity group V soybeans, however with less than two percent infection in the plot. Incidence potential was also low at the George County site with one leaf out of 15 sampled positive for ASR. Plots at both locations were destroyed. In 2004, six sentinel plots were monitored and several counties were found positive for the presence of ASR.

IDENTIFICATION

The most frequently confused diseases with ASR in MS were Septoria brown spot, bacterial blight, and bacterial pustule. The distinguishing characteristics of ASR is raised pustules containing ureidial on the underside of leaves. Bacterial pustule has raised pustules with no ureide. Septoria brown spot and bacterial blight have no raised lesions on the underside of infected leaves.

Which disease is ASR?

At first glance, it’s hard to tell!

Top left: Asian Soybean Rust, caused by Phakopsora pachyrhizi
Top middle: Septoria Brown Spot, caused by Septoria glycines
Top right: Bacterial Pustule, caused by Xanthomonas campestris pv. glycines
Bottom: Bacterial Blight, caused by Pseudomonas syringae pv. glycinea

CONTROL

The key to fighting ASR in MS will be the use of sentinel plots as an early warning system to inform producers when to spray the appropriate fungicides. Options recommended to producers will be based on the prevalence of ASR, where it is being found, if the weather conditions at the time are conducive to disease development, and the growth stage of the crop. Preventative applications of effective fungicides properly timed will prevent rust. Even in the absence of rust, fungicide use could increase yields on average 5.0 bu/A (revealed by a 12 year study in MS), because it will control other diseases that are below treatment thresholds but still reducing yields. Propiconazole, myclobutanil, and tebuconazole are available for use in MS this year, and registrations for other fungicides to control ASR have been requested. Five gpa is the recommended volume for aerial application, and 15 gpa for ground application of fungicides to control ASR in MS.