THE AMERICAN EXPERIENCE WITH SOYBEAN RUST

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The Asian species of the Soybean rust pathogen (*Phakopsora pachyrhizi*) was introduced to South America in 2001. In that time it spread rapidly. Following its initial appearance in Paraguay, rust was identified in Brazil and Argentina in 2002, Bolivia in 2003, and an as yet unconfirmed report from Columbia in 2004, leading to the introduction and initial identification in the US in November of 2004 associated with Hurricane Ivan.

The winter of 2004-2005 held great interest as soybean pathologists and the industry watched for the extent of the range of the survival of the soybean rust pathogen. As the winter freeze penetrated deep into the south in December 2004, it became clear that the overwintering inoculum needed to feed a disease epidemic in 2005 had been severely reduced. From a single know site in Pasco Co., Florida, the disease gradually spread northward to 138 counties in nine states (AL, FL, GA, KY, LA, MS, NC, SC, and TX) between February 23 and December 6, 2005. Of the first detections in each county, 109 were in soybean and 38 were in kudzu. Nonetheless, kudzu is tremendously important in the overwintering process and the spread and distribution of pathogen. Georgia wound up being the crossroads, the site where the battle was pitched. In much of the south, midsummer drought prevented infection and disease development, despite the fact that several forecasting systems were indicating that inoculum was being introduced. In Georgia, research plot yields were reduced by 40-60% in some locations while producers reported losses of 20 bushels per acre. Georgia statewide average yields in 2005 were 28 bushels per acre, so a loss of 20 bushels per acre represents a significant reduction in production. In many cases, rust was recognized late in crop development or after the disease was well established. From 2004 to 2005, planted soybean acres in Georgia dropped by greater than one third. Had soybeans been more densely planted in 2005, rust inoculum may have increased more rapidly and losses may have been greater.

As the season progressed, rust continued up the Atlantic coastal plain, to near the North Carolina border with Virginia. The westernmost (TX) and northernmost (KY) penetrations of the disease were identified on kudzu very late in the growing season. The Kentucky site was killed back by frost within days of being recognized. As of the end of December, the TX site was reported to have died back by 90%, but the remaining kudzu leaves were rust infected. Cold weather in the southeastern US has killed back most of the infected kudzu, reducing the inoculum and risk for 2006, but the freeze has not been as far south as in December 2004. As such, the 2006 growing season will likely have a greater risk of rust from more widespread inoculum sources. However if that risk is to develop into disease, local environmental conditions will be crucial. As in 2005, scouting and monitoring sentinel plots will offer the best information on early detection and quick response with fungicide applications to prevent extensive disease development.

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