Soybean Rust in the United States

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We’ve all seen it—pictures of soybean fields devastated by Asian Soybean Rust, the prediction of costs reaching $2 billion per year for producers and consumers, and the glossy, full-colored images suggesting the imminent, unsuspecting, and complete destruction of a robust soybean crop. Does Asian Soybean Rust pose a substantial threat to United States soybean producers? Perhaps it’s not as great a threat as the pesticide companies may want you to think. However, the rust detection maps aren’t lying. Soybean Rust is advancing into the southern United States at a relatively fast pace. If Asian Soybean Rust reaches the lush, susceptible soybean acreage of the United States, there will be added costs to the production of soybeans in the United States. While preparing for the entrance of Asian Soybean Rust into the spectra of soybean pest management, we must keep a rational, yet attentive approach to the potential risks and consequences of this new disease.

Asian Soybean Rust is caused by the fungal pathogen, *Phakopsora pachyrhizi* (Borron, 2005). The first official documentation of Asian Soybean Rust was in Japan in 1902 (Stokstad, 2004). It hasn’t been until recent years that the pathogen has spread from Southwestern Asia. In 1996, Africa became the first major continent to be hit by the detection of the fungus in Uganda (Livingston, 2004). In the next couple of years, it raced throughout central Africa infecting the countries of Kenya, Nigeria, Rwanda, Zambia, and Zimbabwe (Livingston, 2004). Now the disease is well established in these areas. A similar event happened in South America. After rust was detected in Paraguay in 2001, it spread throughout Brazil, Argentina, Bolivia, and Columbia within a matter of two to three years (Sweets, 2005). Reports from these newly infested continents have shown shocking effects of this rust with nearly 80% of soybean crop lost in some of the worst infected areas (Wilson, 2005). The effect of Asian Soybean Rust in Africa and South America has proven Asian Soybean Rust to be the most destructive foliar disease of soybean (Frederick, 2003). Now it is North America’s turn to play host to this relentless disease. On November 10, 2004 the very first Asian Rust Spores were found in the United States on a Louisiana State University Research Farm (Borron, 2005). Within only a few weeks, rust confirmation reports were springing up in the states of Mississippi, Alabama, Georgia, Missouri, South Carolina, and Tennessee (Wilson, 2005). Today, Asian Soybean Rust is right on the edge of attack. Having currently established itself on kudzu, it is positioned to begin its effect on a major portion of United States Soybean acreage this growing season.

Being the number one producer of soybeans in the world, the United States has a lot at stake with Asian Soybean Rust. Although the soybean was introduced to the United States in the early 1800s, the hay crop, the soybean seed was eventually discovered to contain a source of oil and protein in the industrial age (Bromfield, 1984). Eventually, the production transitioned from being grown for silage and hay to being grown for the actual beans themselves (Bromfield, 1984). It wasn’t until after World War II that the production of soybeans escalated into the vital crop it is today (Bromfield, 1984). In 2003, the United States grew soybeans on over 73.4 millions acres (Stokstad, 2004), in which $18 billion worth of soybeans were produced (Stokstad, 2004). Soybeans alone account for an estimated 15% of all US exports (Livingston, 2004). Although soybean production was originally being grown for the actual beans themselves (Bromfield, 1984), in 2003, the soybeans were being grown for the actual beans themselves (Bromfield, 1984). Eventually, the production transitioned from being grown for silage and hay to being grown for the actual beans themselves (Bromfield, 1984). The majority of the soybeans being grown in the United States today are grown in the rich, deep soils of the Corn Belt, the Lake States, and the Delta with moderate production north of the Ohio and the Mississippi River (Johansson, 2005). Some soybeans are still grown in the Delta, Appalachia, and Southeast (Alexander, 2005). With such a vast acreage and tremendous volume of production, it is no surprise to researchers, government officials, and experts about the spread of Asian Soybean Rust.

Asian Soybean Rust is classified as a basic fungus with only one common spore stage: the teliospores. Numerous teliospores have been identified in Asia and other environments, this form of the fungus is easily identified (Frederick, 2003). Asian Soybean Rust is a fungus found in nature to have one spore: the ureus (Frederick, 2003). The spore begins its attack to the leaf surface and then germinates (Frederick, 2003). In order to germinate, however, the spore