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Managing SCN May Reduce Yield Loss from Other Diseases

Soybean cyst nematode (SCN) occurs in most countries where soybeans are produced. In fact, it occurs in 93.5 percent of the area where soybeans are grown as a major crop. The first confirmation of SCN in the United States occurred in Wilmington, North Carolina in 1954 and it has been moving north and west ever since. SCN is believed to have been introduced by contaminated soil on flower bulbs from Japan, but it rapidly became the number one yield-robbing pest of soybean producers.

Despite decades of research, SCN continues to spread and cause damage throughout most areas of the world. Areas with large-scale agriculture, such as the United States and Brazil, where machinery is moved over many fields, and soil movement is often unabated from wind and/or water erosion, are more likely to see the rapid spread of SCN to non-infested areas. It is likely that the use of custom applicators, which rapidly move from field to field to control insects and weeds, has also contributed to the rapid spread of SCN within the United States.

Many biotic and abotic factors influence the often symptomless yield loss caused by SCN. Interactions of SCN with soil-borne fungal pathogens have shown to increase yield loss in susceptible soybean varieties. Nearly 30 years ago, researchers discovered that root rot caused by *Phytophthora* was intensified in the presence of SCN. Michigan researchers recently reported similar findings.

Brown stem rot is another fungal pathogen that is being more intensely scrutinized by researchers. Not only have they reported that brown stem rot increased in the presence of SCN, but two distinct biotypes have been discovered to show different symptoms. Other researchers have reported brown stem rot-resistant soybeans infected with SCN become more susceptible to the disease. Ongoing checkoff-funded research is trying to explain the impact of a SCN/brown stem rot interaction on grain yield.

Phytophthora and brown stem rot are not the only diseases where an additive effect of a SCN/pathogen interaction exists. Similar results have been reported for sudden death syndrome and charcoal rot. The area affected by sudden death syndrome is expanding and is following an expansion path similar to SCN. Likewise the area affected by charcoal rot is also expanding but at a slower rate than sudden death syndrome.

Managing SCN removes one of the most restrictive stresses on the soybean crop. Several management programs have been developed to help reduce the effect of SCN but none, including genetic resistance, have given the soybean producer immunity from SCN-related yield loss. Even soybean varieties with SCN resistance are at risk from parasitism by SCN. Researchers have also found that field populations of SCN vary in their ability to parasitize different soybean varieties, making management programs even more difficult. Despite the variability, one of the best management decisions a grower can make is to plant SCN-resistant varieties.

It is unlikely that SCN will ever be eradicated; it is quickly being woven into the fabric of our global production system. It is also unlikely that researchers fully understand the impact of SCN on soybeans. Studies to determine soybean gene activity during SCN-induced stress began only recently. Continued research into the SCN/pathogen complex is crucial if we are to fully understand and decrease long-term yield loss. For more information on SCN and for information to help soybean producers reduce yield loss access www.planthealth.info.