

An integrated approach to enhance durability of SCN resistance for long-term strategic SCN management (Phase II)

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Overview of project objectives

The soybean cyst nematode (SCN) is the most damaging pathogen to soybean production in North America. Although SCN-resistant soybean varieties are available to minimize yield loss, producers are faced with limited options for rotation once SCN develops in their fields. The lack of genetic diversity in SCN resistance has significantly increased the prevalence of SCN and reduced the effectiveness of current resistance sources. The team focused on two challenges that, when achieved, would enable scientists to develop more efficient SCN management practices. The first challenge is to increase the genetic diversity of SCN resistance in commercially available soybean varieties. The second challenge is identifying the SCN genes required for the adaptation to reproduce on resistant varieties and use these as markers to monitor nematode population shifts in the field.

Key results

The researchers focused on five main objectives. First, they worked on diversifying the genetic base of SCN resistance in soybeans and developing germplasm with new combinations of resistance genes. Field tests of soybean lines with new combinations of SCN resistance genes were grown in Illinois and Missouri. For the second objective, the research team worked on identifying SCN virulence genes to better understand how the nematode adapts to reproduce on resistant soybean varieties. Thirdly, they determined what combinations of resistance genes would be beneficial to enhance SCN resistance durability. Experimental lines containing various resistance gene combinations were tested in a greenhouse study. The fourth objective covered outreach and education of producers about this work. Objective five included coordination of testing the publicly developed SCN resistant lines.

Benefit to farmers

This research work will tremendously improve breeding efforts and will critically inform farmers' cultivar decisions. By creating a long-term management strategy for SCN management and germplasm development, farmers may have more alternatives in soybean cultivars that are SCN-resistant to combat this crop-devastating pest.

Links

[An integrated approach to enhance durability of Soybean Cyst Nematode resistance for long-term strategic management](#)

USB National Soybean Checkoff Research Database