

Checkoff-Funded Project: Refocusing attention on the most yield limiting pathogen of soybeans

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What causes an estimated 90,000,000 bushel yield loss of soybean in the North Central U.S. each year? What can cause an eye-popping 30 percent yield loss without above-ground symptoms? What can move any way that soil moves? What can invade a soybean plant and cause more severe brown stem rot and sudden death syndrome symptoms?

The answer to each question is the same: the soybean cyst nematode (SCN). SCN is a microscopic roundworm that in the U.S. was first found in North Carolina in 1954. SCN has since moved north and west, reaching southern Minnesota in 1977. Little by little, year-by-year, SCN continues to spread, marching north in the state along with soybean production (Figure).

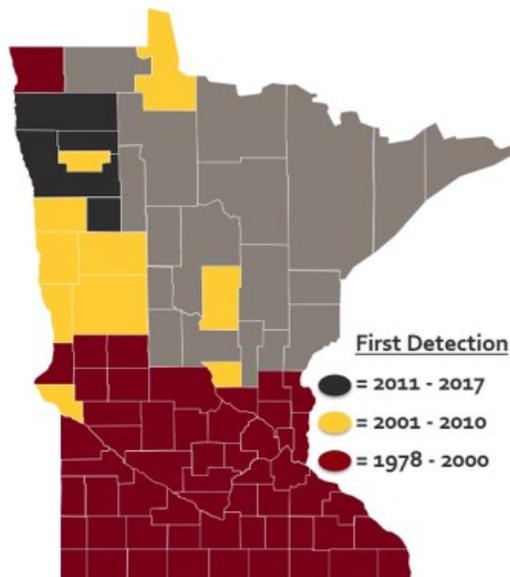
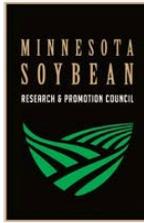


Figure. When SCN was first identified by Minnesota county.

It is not yet known what percentage of northwestern Minnesota fields are infested (incidence) or to what degree (severity). This is true even for Polk County, the largest soybean producing county in the state ([USDA-NASS, 2017](#)).



A ticking time-bomb. Soybean has been an attractive crop in recent years, resulting in 3,564 more soybean fields and 328,964 more soybean acres in northwestern Minnesota counties (Clearwater, Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake, Roseau) in 2016 compared to 2012 (USDA-FSA, 2017). Growing soybean after soybean is also becoming more common. Research has shown that alkaline soils, which are common in northwestern Minnesota, can support 3.8-fold higher SCN populations than more acidic soils ([Pedersen et al., 2010](#)). Combined, these data suggest that the Northern Red River Valley is at particular risk for developing and sustaining yield limiting SCN populations.

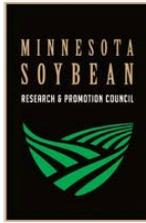
Sampling and management are key. Using average expected per-acre soybean yields and market prices, NDSU plant pathologist and project cooperater Dr. Sam Markell estimates the economic value of SCN detection (and subsequent management) to be more than \$25,000 per sampled field ([Markell, 2015](#)). Despite the importance of monitoring and managing SCN to maximize soybean production, many producers remain unaware of the threat that SCN poses or how essential both monitoring and management are to maintaining crop productivity.

The project. To address this critically important SCN knowledge gap, this project will:

- 1) Develop a MN SCN sampling program to determine incidence and severity of SCN populations
 - a. Gain a better understanding of the incidence and severity of SCN infestations in the northwest region and throughout the state and identify population 'hot spots' for further study.
 - b. Share the results of the sampling program through Extension- and MSR&PC-sponsored meetings and publications.
 - c. Deliver a geo-referenced map summarizing incidence and severity based on submitted samples.

- 2) Develop a MN SCN education program to stress how sampling to monitor populations is essential for effective management
 - a. Increase awareness regarding the threat that SCN poses to soybean yields through the production of educational materials for farmers and other agricultural professionals.
 - b. Encourage SCN sample collection by providing educational materials, sampling bags and complimentary analysis of up to 1300 soil samples.

Stay tuned. Stay tuned in the coming year for SCN-related information to appear in University of Minnesota Extension's [Crop News Blog](#) and/or at Extension programs this summer. To participate in the sampling program and receive sample bags and instructions (quantity limited) contact Angie {apeltier@umn.edu, (218) 281-8692}.



For more general information about SCN, consider visiting www.thescncoalition.com, a website specifically dedicated to SCN and developed by a coalition Universities, check-off organizations and corporate partners. Additionally, a Minnesota Soybean Cyst Nematode Management Guide is available from U of MN Extension.