STATUS REPORT

SOYBEAN CYST NEMATODE

2024

PLANT INDUSTRY BUREAU LAB
WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

Soybean cyst nematode *(Heterodera glycines*) is the greatest yield-reducing pathogen of soybeans in the United States (Wrather, 2007). In addition to soybean, soybean cyst nematode (SCN) infects beans, peas, and common weeds that can serve as a reservoir of the pest. The lifecycle of SCN can be divided into three stages: egg, juvenile, and adult (Figure 1). After egg hatch, motile juveniles migrate to host root tissue and establish feeding sites within the root to complete development. Mature females will emerge from the root tissue and stay loosely attached by their head (Figure 2). The female's body develops into a protective cyst around the mature eggs, protecting them until they hatch. This lemon shaped cyst is extremely durable and can persist in the soil for years. The damage caused by SCN to roots make soybeans more susceptible to other diseases including *Pythium*, *Rhizoctonia*, *Fusarium* (sudden death syndrome) and *Macrophomina* (charcoal rot).

Figure 2. SCN cysts, pale cream objects, attached to soybean roots. Photo: Craig Grau, Bugwood.org.

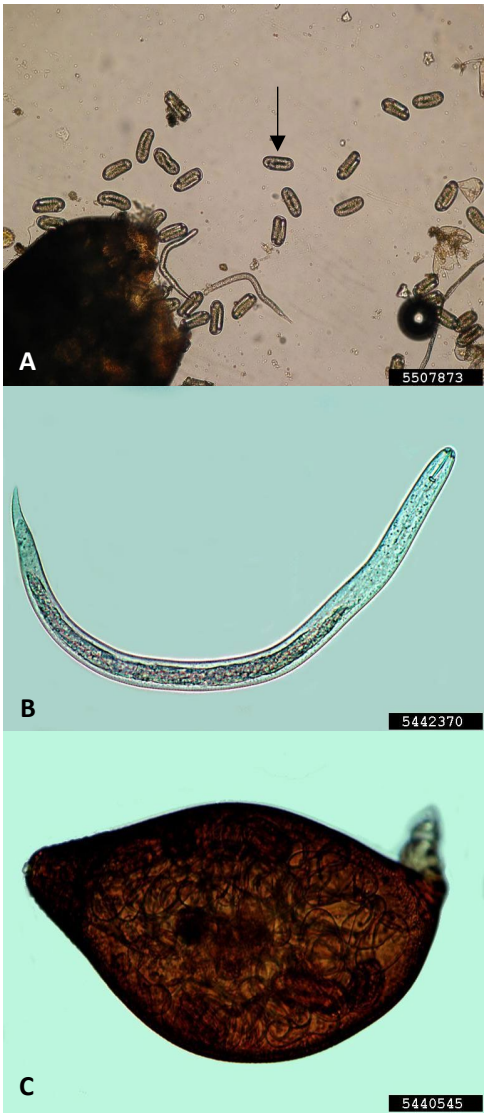

Figure 1. SCN eggs emerging from broken cyst. Eggs indicated by black arrow (A). SCN juvenile nematode (B). Lemon-shaped SCN cyst (C). Photos: Stefano Sacchi, Regional Plant Protection Service, Bugwood.org (A), Jonathan D. Eisenback, Virginia Polytechnic Institute and State University, Bugwood.org (B & C).

Wisconsin Distribution

The map in Figure 3 shows all counties known to be infested in Wisconsin, from the first find in a Racine County field in 1981 to the latest detection in Barron County in 2023. The total number of Wisconsin counties with at least one SCN field is 54. Soybean acreage in the counties where SCN has been detected adds up to 94% of the soybean crop in Wisconsin.

History

Soybean cyst nematode was first detected in the U.S. in 1954, in Hanover County, North Carolina. Survey efforts in 1957, 1958 and 1962 did not find this nematode in Wisconsin. Annual statewide soil surveys by DATCP and the University of Wisconsin began in 1978. A federal quarantine for SCN established in 1957 was found ineffective and lifted in 1972. Soybean cyst nematode was brought to Wisconsin in 1980 on infested soil associated with cabbage transplants from Tennessee. By 1981, the first soybean field was found infested with SCN in Racine County. Continued annual statewide soil testing documented the spread of this nematode in Wisconsin county by county (Figure 4 and 5). From 1996 to 2013 the survey effort focused on non-infested counties neighboring infested counties. DATCP continues to provide SCN testing for export certification but has not conducted surveys for SCN since 2013. Since 2013, new county records are reported as verified field test results become available.

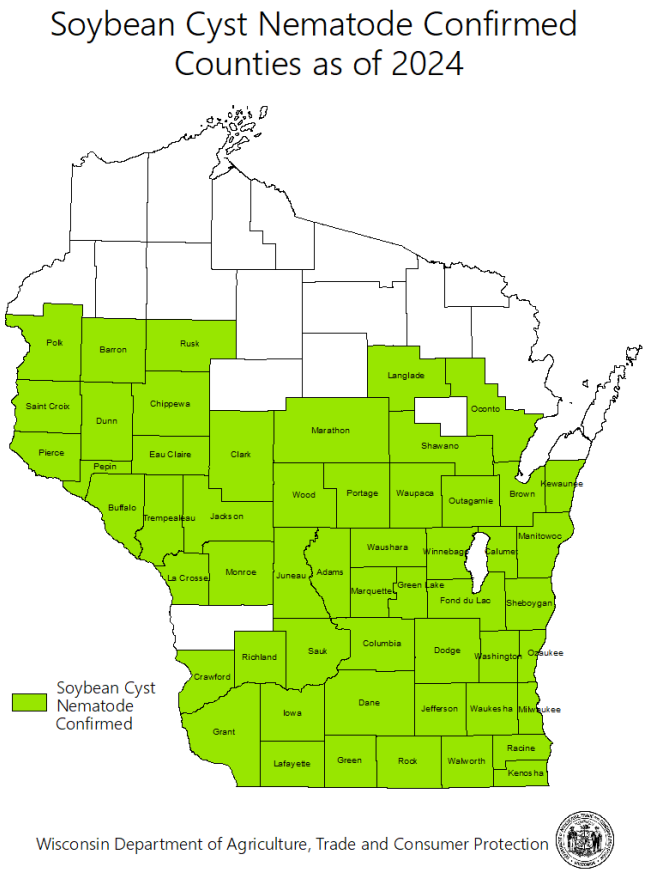

Figure 3. Wisconsin map showing soybean cyst nematode confirmed counties as of 2024.

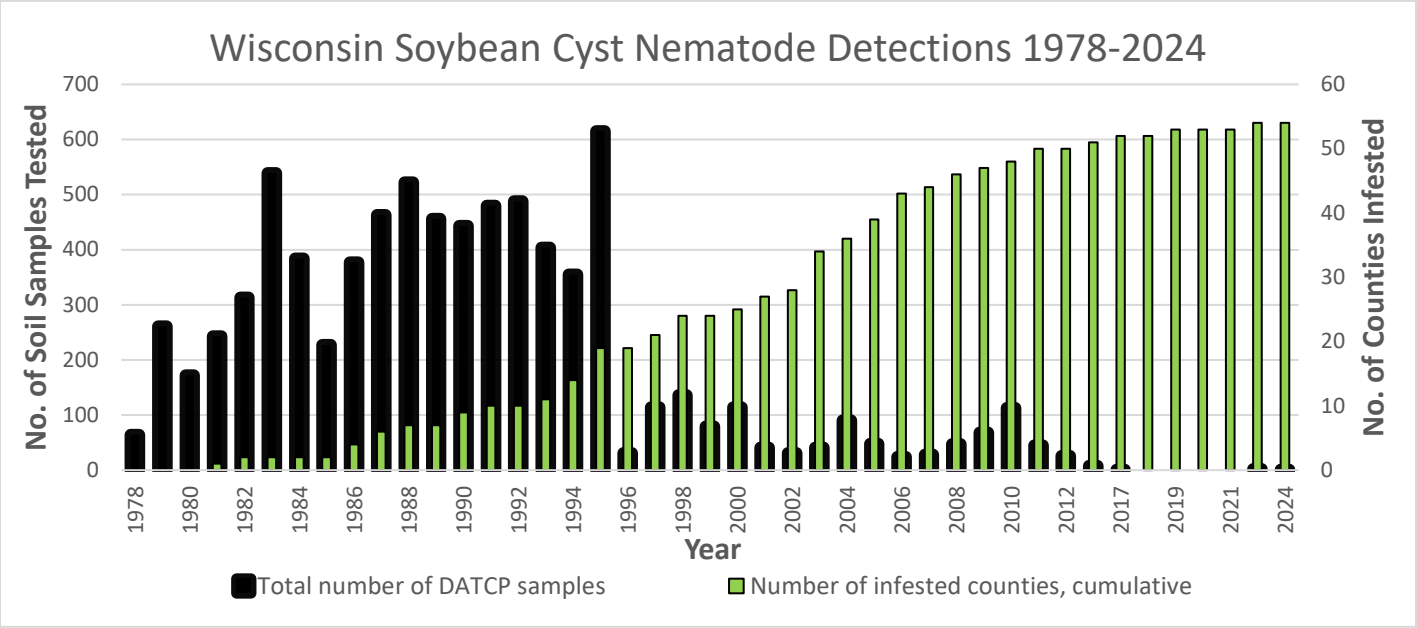

Figure 4. The number of soil samples collected by DATCP from 1978 through 2024 and the increasing cumulative number of Wisconsin counties found to be infested with SCN.

County	Year
Adams	1995
Barron	2023
Brown	2006
Buffalo	1986
Calumet	2008
Chippewa	1995
Clark	2005
Columbia	1994
Crawford	1987
Dane	1997
Dodge	2001
Dunn	1991
Eau Claire	1994
Fond Du Lac	2007

County	Year
Grant	1998
Green	2002
Green Lake	2003
Iowa	2000
Jackson	2011
Jefferson	1997
Juneau	1995
Kenosha	1982
Kewaunee	2019
La Crosse	1986
Lafayette	2003
Langlade	2017
Manitowoc	2006
Marathon	2013

County	Year
Marquette	2001
Milwaukee	1990
Monroe	2008
Oconto	2010
Outagamie	1998
Ozaukee	2003
Pepin	1993
Pierce	2006
Polk	2011
Portage	2006
Racine	1981
Richland	2005
Rock	1994
Rusk	2005

County	Year
Sauk	1995
Shawano	2004
Sheboygan	1998
St. Croix	2003
Trempealeau	1987
Walworth	1988
Washington	1995
Waukesha	2003
Waupaca	2003
Waushara	1990
Winnebago	2004
Wood	2009

Figure 5. Wisconsin counties with SCN detections and the year of the initial detection.

Testing

Soybean growers statewide are strongly urged to sample their fields for SCN. Soybean cyst nematode may go undetected in fields because of the lack of above-ground symptoms but can still cause yield losses. Effective control management requires accurate assessment of each individual field and choosing resistant varieties if necessary.

Wisconsin growers are eligible to have four soil samples screened for SCN and other plant parasitic nematodes at no charge through a grant from the Wisconsin Soybean Marketing Board. Additional information and how to request your free testing can be found at https://coolbean.info/soybean-research/scn-testing-program/. Private laboratories also offer testing services.

Additional information on SCN can be found at www.thescncoalition.com. Management information from the University of Wisconsin Field Crop Pathology, can be found at www.badgercropdoc.com/soybean-2.

Reference

Wrather, J. A. University of Missouri-Delta Center, P.O. Box 160, Portageville, MO 63873, and Steve Koenning, North Carolina State University, “Soybean Disease Loss Estimates for the United States, 1996-2007”.

AUTHORS

Sam Fieweger, Elly Voigt, Anette Phibbs, Adrian Barta
Plant Industry Bureau Pest Survey

PEST SURVEY PROGRAM

WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION
2811 Agriculture Drive, PO Box 8911, Madison, WI 53708-8911 | https://datcp.wi.gov
https://www.pestsurvey.wi.gov pest hotline: (866) 440-7523