

SPREAD. GROWTH. SOLUTIONS.

SPREAD OF SOYBEAN CYST NEMATODE AND GROWTH OF RESEARCH FOR SOLUTIONS

Though SCN has been in North America for at least 70 years, the story of the pest and its management solutions began decades earlier. Thanks to USDA research, a soybean variety with native resistance to SCN was collected in China in 1906, before SCN was identified in Asia and soybeans became a common U.S. crop.

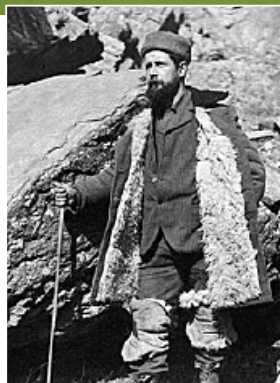
In the following years, the foresight of farmers, agronomists and scientists enabled development of research infrastructure to tackle complex challenges. Because of these efforts, work on SCN solutions started and ramped up quickly as the problem became clear. In fact, the foundation to build solutions was already available in the soybean germplasm collection.

This timeline shows that as SCN has spread, so have research efforts.

1900s

1906 – USDA researcher Frank Meyer collects the black-seeded Peking soybean variety in China

Frank N. Meyer on a plant collection trip to China for the USDA Office of Seed and Plant Introduction



USDA researchers Palemon Dorsett and William Morse on a plant collection trip in China

1930s

1906 – USDA researcher Frank Meyer collects the black-seeded Peking soybean variety in China

1915 – SCN is first reported in Japan

1920 – The American Soybean Association is founded by soybean farmers, agriculture extension specialists and breeders

1930 – William Morse, USDA soybean specialist, collects PI88788 variety in China

1936 – SCN is discovered in Korea

1936 – Uniform soybean variety testing begins in Illinois, Indiana, Iowa, Missouri and Ohio

1938 – SCN is documented in Manchuria

1943 – Uniform soybean variety testing extends to 12 southern states

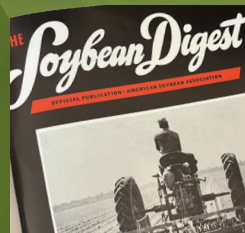
1944 – Congress funds soybean disease research through the USDA Bureau of Plant Industry, thanks to lobbying efforts of soybean farmers and crushers

1944 – The Southern States Soybean Planning conference includes growers who helped direct breeder efforts

1949 – USDA formally establishes the soybean germplasm collection



1940s



June 1955
Soybean
Digest

Rapid expansion in soybean
production begins

1950s

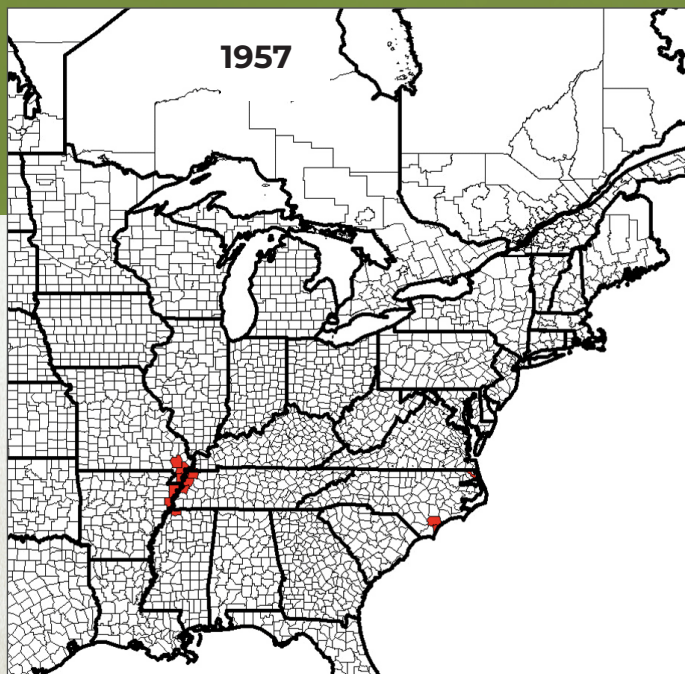
1954 – Initial discovery of SCN on 6 farms covering 200 to 300 acres in New Hanover County, North Carolina

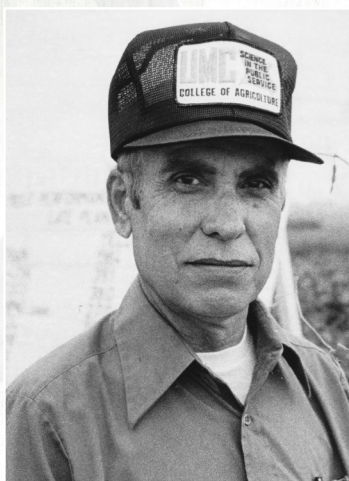
1955 – First mention of SCN in Soybean Digest

1956 – Quarantine is established in North Carolina

1956 – To begin screening for genetic resistance, a wide range of germplasm is planted in one of the North Carolina fields where SCN was first found

1957 – Researchers plant 3,500 strains originally from eastern Asia in an SCN-infested field near Wilmington, North Carolina





1960s

1960s – Farmers begin to form voluntary state associations affiliated with ASA, and checkoff legislation starts passing on a state-by-state basis; state checkoff boards often fund ASA research with state checkoff funds



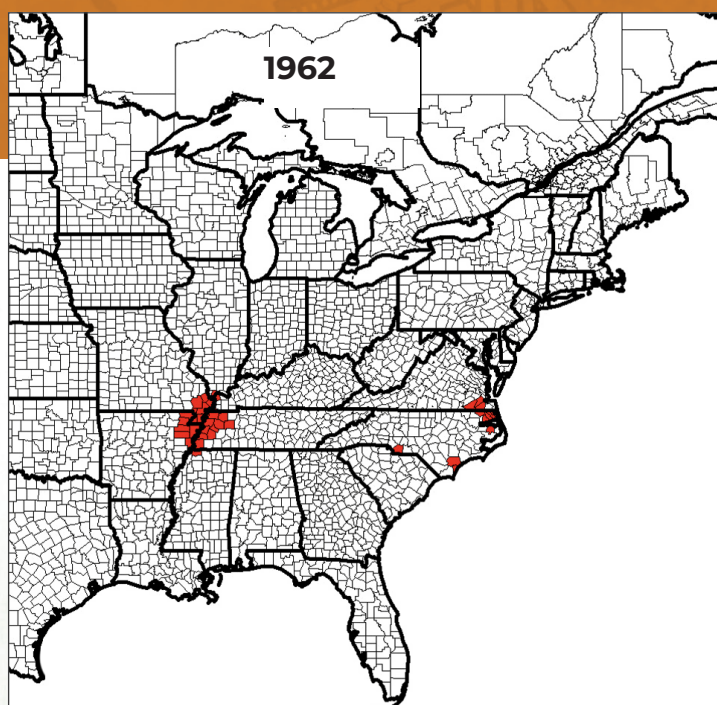
1961 – USDA identifies SCN in 37 counties in 8 states

1963 – Three breeding programs in North Carolina, Missouri and Mississippi/Tennessee almost simultaneously obtain SCN resistance in yellow-colored soybeans

1965 – A group of Midwestern seed companies establish the Soybean Research Foundation to develop soybean varieties

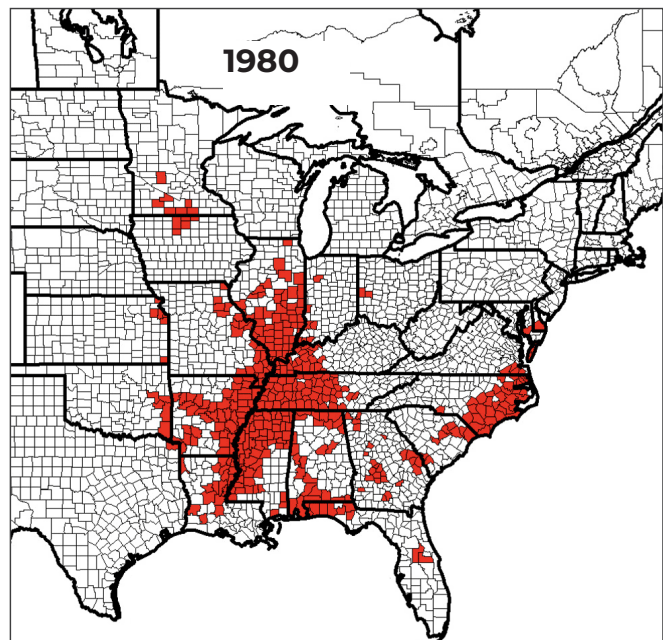
1965 – The Pickett breeding line containing SCN resistance is released

1967 – Dywer and Custer genetic lines with SCN resistance are released



"We monitor the number of soybean cyst nematode by soil sampling every field, every year. We also send in root samples throughout the year, and then we keep track of the numbers. If they start to get too high, we will rotate with corn-on-corn or alfalfa."

— TOM FRISCH, FARMER, DUMONT, MINNESOTA



1981 – Fayette line with PI88788 resistance is released

1987 – SCN is discovered in Kent County, Ontario, Canada

1980s

1970 – The Plant Variety Protection Act passes, resulting in soybean breeding expansion to the commercial sector

1970s



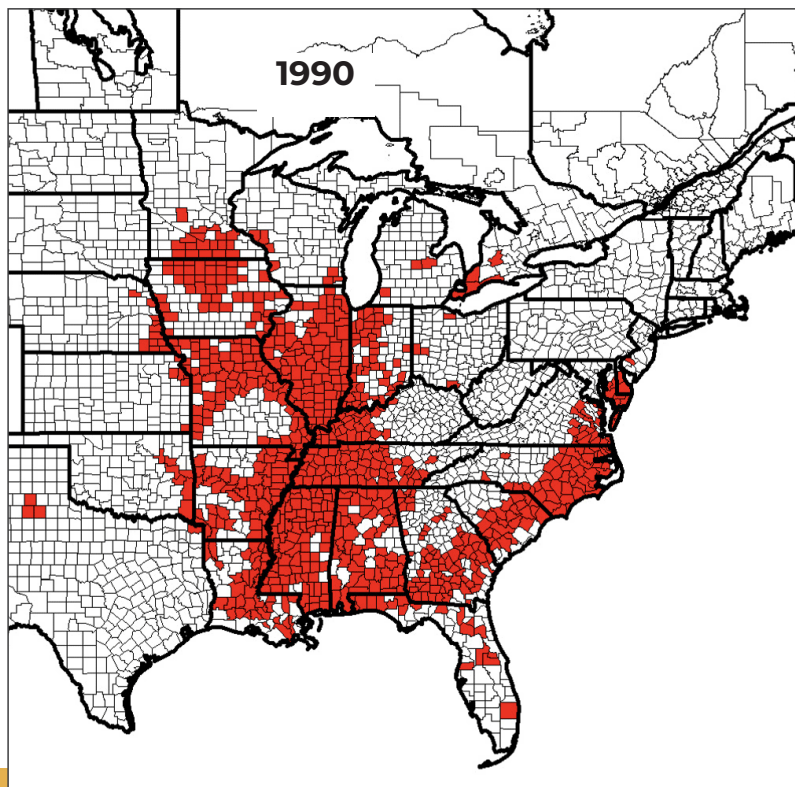
1972 – SCN quarantine is declared ineffective and lifted; southern breeders begin including PI88788 in breeding programs

1974 – SCN becomes the most damaging soybean pathogen in the country

1979 – Northern Region SCN tests coordinated at the University of Illinois

PI88788





1991 – Hartwig variety with PI437654 resistance is released

1992 – A collaboration of states found the North Central Soybean Research Program, or NCSRP

1992 – Iowa State University starts an ongoing regional SCN education and research program

1993 – The soy checkoff begins providing support to the Northern Region SCN Tests at the University of Illinois

1994 – Release of Faribault variety, which contains PI209332 resistance

1995 – First national SCN conference is held in Ames, Iowa

1990s

1991 – The national checkoff program is enacted, and the United Soybean Board forms



Edgar Hartwig became curator of the southern soybean germplasm collection



1997 – The first SCN Coalition is created with soybean checkoff funding through NCSRP and tasked with encouraging farmers to sample soil for SCN

1998 – The Agriculture Research, Extension, and Education Reform Act increases funding for agriculture research and crop insurance

1999 – Second national SCN conference is held in Orlando, Florida

The **SCN** Coalition™

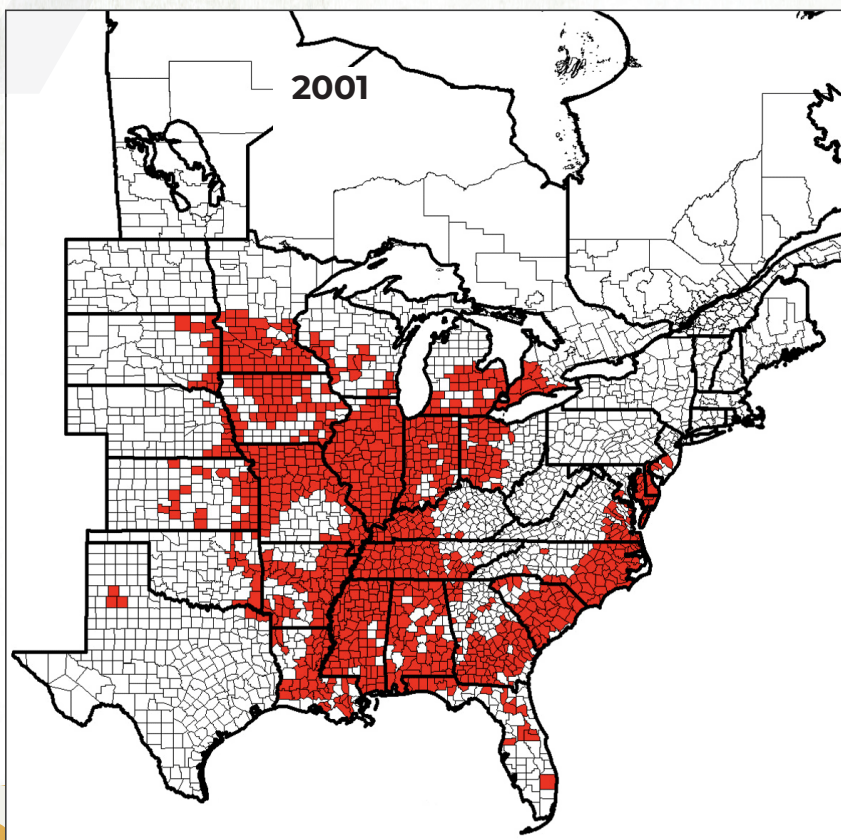
Funded by the soybean checkoff



2002 – Third national SCN conference is held in St. Louis, Missouri

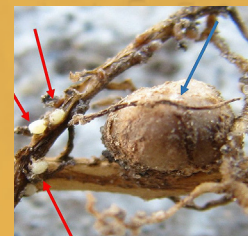
2008 – Soybean genome sequencing, funded in part by the soy checkoff, is completed

2008 – Fourth national SCN conference is held in Tampa, Florida



» 2000s

2001 – Indiana CystX germplasm, derived from PI437654, launches following its discovery by checkoff-funded researchers



» 2010s

2014 – SCN spreads to an additional 57 counties in 13 states since 2008, including the last county in Illinois

2015 – Nearly 90% of SCN-resistant soybean varieties in the upper Midwest use PI88788 as the source of resistance

2016 – Fifth national SCN conference is held in Coral Gables, Florida

2017 – SCN infests an additional 37 counties in 17 states since 2014, including the first observation in New York, and the final county in Iowa

2018 – A revitalized SCN Coalition is launched to prevent a resistance crisis, with the goal to increase testing for nematodes, determining the soil population density and actively managing for SCN across the country

2018 – The first National SCN Strategic Plan releases as a framework to prioritize, guide and synergize research efforts across the U.S. and Canada

What's your number?

Take the test.  Beat the pest.

The **SCN** Coalition™

Funded by the soybean checkoff

2020 –SCN is found in every soybean-producing state in the U.S. except West Virginia, spreading to an additional 55 counties in 11 states and 24 Canadian counties since 2017, which is 1.5 times as many new counties as in the previous 3-year period; states with newly discovered SCN-infested counties include Kansas, Kentucky, Michigan, Minnesota, Nebraska, New York, North Carolina, North Dakota, South Dakota, Virginia and Wisconsin

2020 – Syngenta releases two soybean varieties with PI89772 resistance, the first of their kind

2022 – SCN reproduction on PI88788 reaches all-time high in Iowa, with female indices exceeding 75% in 3 fields; a female index greater than 10% is considered to be overcoming resistance

2022 – Sixth national SCN conference is held in Savanna, Georgia

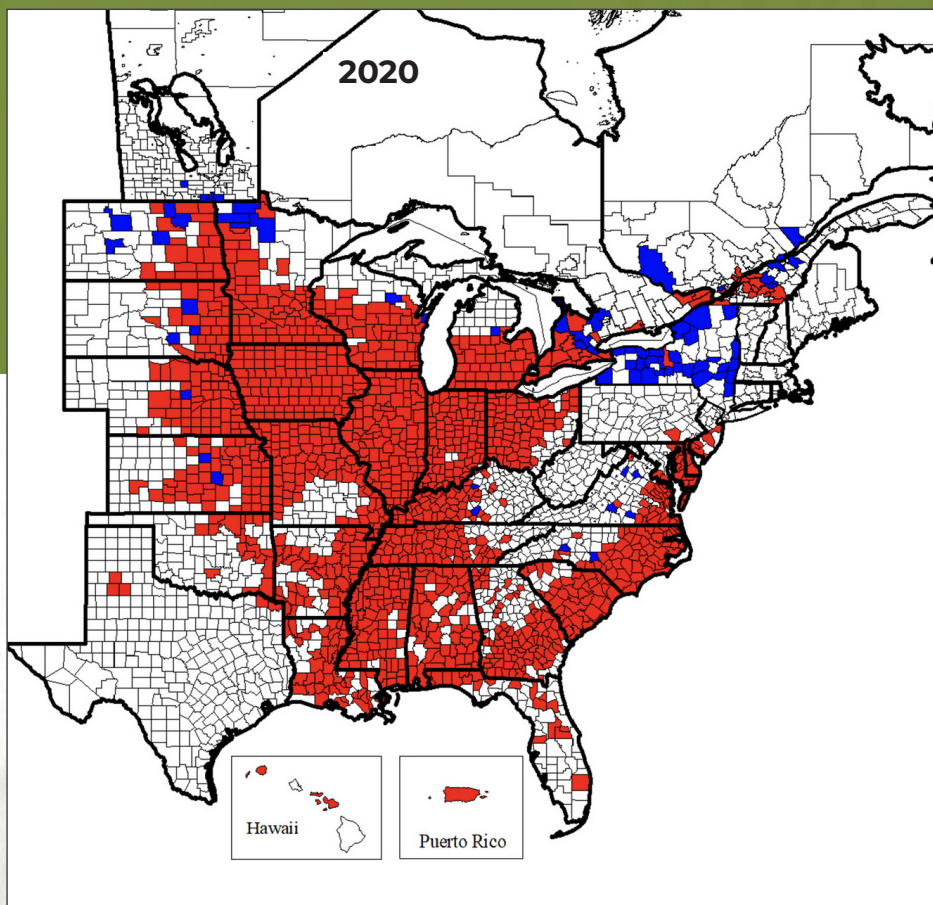
2023 – SCN remains the most economically damaging pest to soybeans, with an estimated yield loss exceeding \$1 billion annually

2023 – To date, SCN has not been discovered and reported in West Virginia or Prince Edward Island, Canada

“Each time we figured out the gene and protein responsible for a particular SCN resistance trait it has created opportunities for cheaper and more accurate breeding.”

– ANDREW BENT, PLANT PATHOLOGY
PROFESSOR, UNIVERSITY OF
WISCONSIN

›2020s



Map shows the known distribution of the soybean cyst nematode, *Heterodera glycines*, in counties and rural municipalities in the United States and Canada in 2020. Those reported as infested since 2017 are shown in blue; those known to be infested in 2017 or before are indicated in red. ¹³

[see maps](#)



“We will consistently battle against this stubborn and aggressive pest until we can be confident that we have won the fight.”

— MARK SEAMON, RESEARCH DIRECTOR, MICHIGAN SOYBEAN COMMITTEE

