

SURVEY OF SOYBEAN CYST NEMATODE IN WISCONSIN

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Introduction

Soybean Cyst Nematode (SCN) was first found in the US in North Carolina in 1954 and now is considered the most serious soybean pest in the US. A microscopic roundworm, the nematode now occurs in all major soybean production areas including Wisconsin. It is believed that SCN was first discovered in southeastern counties of the state in the early 1980s. Since soybean acreage has increased dramatically since then, so has the spread of SCN. SCN causes no specific symptoms and its effects are often not dramatic. Many growers do not know they have a problem until a severe infestation develops. SCN is detrimental to soybean because it lowers yields by as much as 50% and compromises plant health by making the soybean more susceptible to other pathogens and moisture stress.

Understanding the life cycle of SCN, routine soil testing and proper crop management can reduce the incidence of this pest. Ongoing educational and testing services are needed to continue to combat this disease. One of the primary approaches to control of this pest is to first identify its existence in soybean fields.

Procedure

Beginning in 2002, an education program was initiated which allowed soybean growers to have their fields tested for the presence of SCN free of charge. This program was funded by a grant from the Wisconsin Soybean Marketing Board and administered through the UW-Madison, Dept. of Agronomy. Any interested soybean grower could request a sampling kit that included a postage-paid, preaddressed soil sample bag with soil sampling instructions. The grower was then responsible to take a soil sample from their field and send it in to have the laboratory analysis for SCN done. The grower then received the test results by mail along with an interpretation of the numbers. The program was limited to 500 free tests.

Promotion of this project was accomplished through the UW Soybean Research and Extension Project, UWEX County based Agricultural Agents, and the Wisconsin Soybean Association.

Results and Interpretation

Approximately 300 free soil sampling kits were sent out to growers between September 1 and December 15, 2002. As of December 31, 2002, 152 of these samples from 25 counties have been submitted to the lab and processed. Because the information in this survey was not from a random selection of fields in Wisconsin, results only reflect SCN counts from growers voluntarily participating in this educational effort.

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Lab procedures to test a sample for SCN involve adding water to a soil sample and then passing it over a sieve to remove the cyst (female) stage of the nematode. The cysts are then separated from organic debris by a centrifugation technique and then crushed to release the eggs. Each cyst may contain 10 to 250 eggs. Egg counts are used to assess the risk of yield loss due to SCN. SCN results are usually expressed as the number of eggs per volume of soil. Egg population density is a better predictor of risk than cyst number.

Figure 1 shows the frequency distribution of SCN egg counts in the samples submitted to date. Of 152 analyzed samples, 95 were negative for the presence of SCN. The highest SCN numbers were from a field in Rock County with 3306 eggs/100 cc of soil.

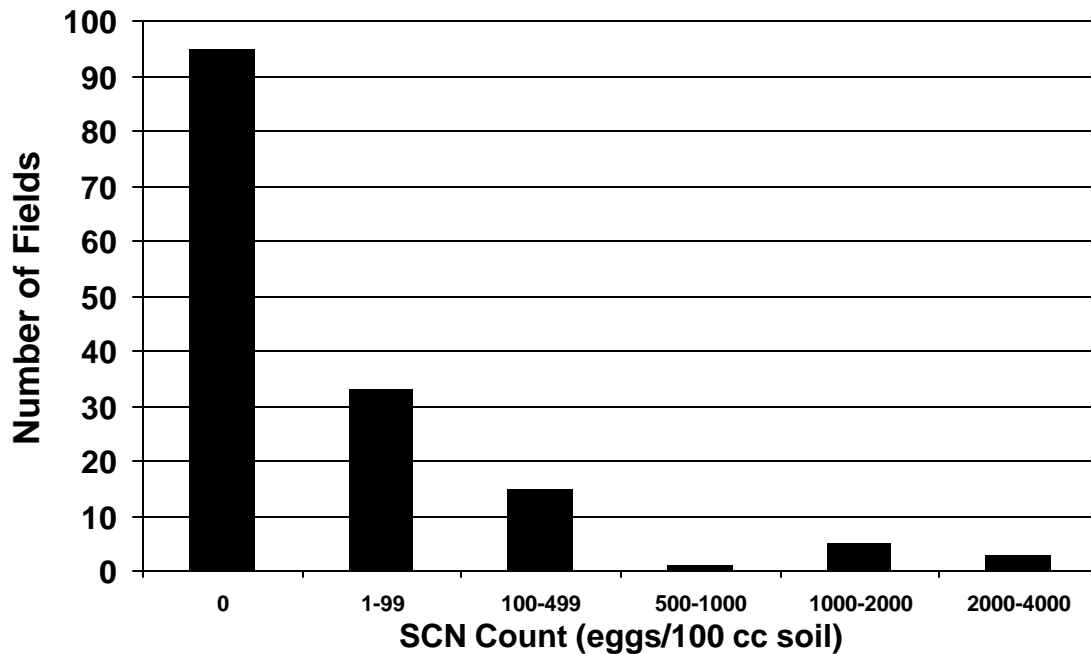


Fig. 1. Frequency distribution of SCN eggs in soil samples submitted for analysis in 2002.

Distribution of SCN in Wisconsin

To date, there have been two main sources of information regarding the geographical distribution of SCN in Wisconsin; the SCN Coalition Project of 1997-1999 and the Wisconsin Department of Agriculture, Trade, and Consumer Protection (WDATCP). Both random and concentrated surveys of SCN have been performed over many years by the WDATCP. The latest WDATCP map (2001) of SCN distribution in the state is shown in Figure 2. This distribution only indicated positive identification in a particular county, but does not reveal area of the county infested, or levels of infestation. Following analysis of data gathered from the UW-SCN testing project, four new counties have been identified with SCN: Brown, Green, Manitowoc, and Waukesha.

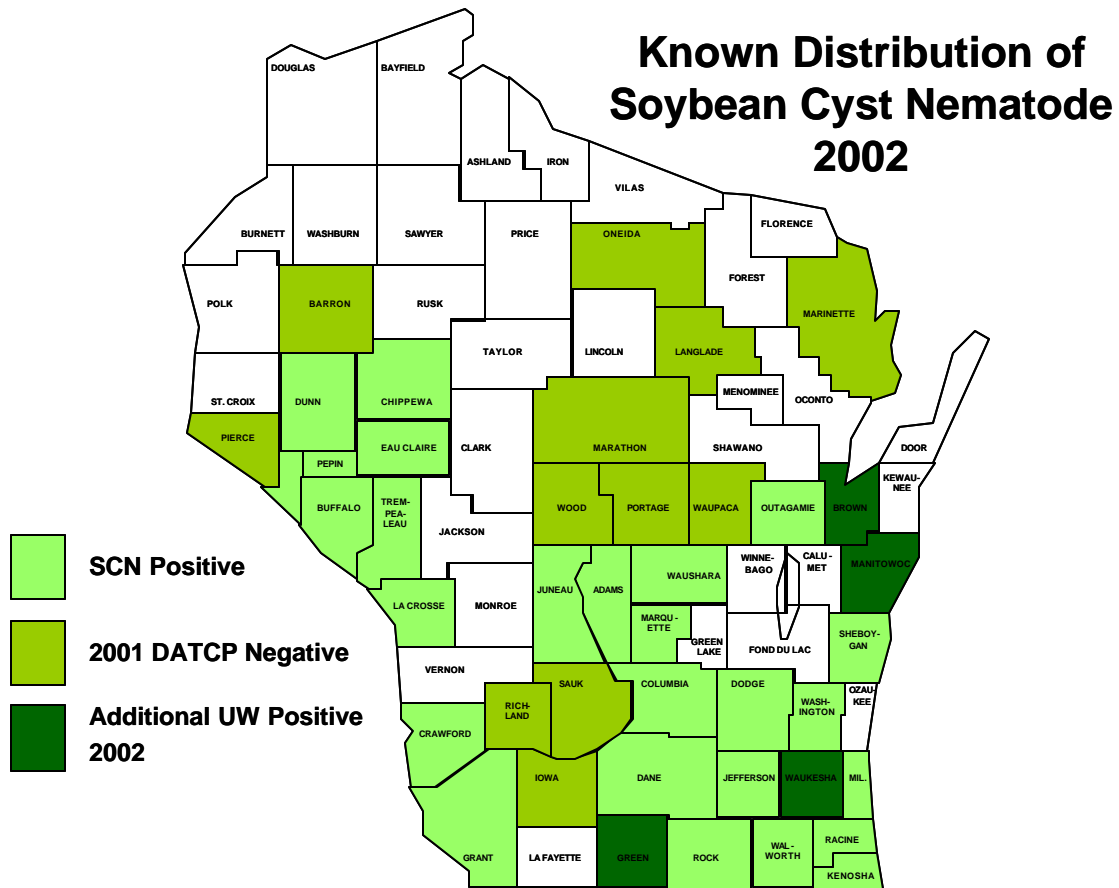


Fig 2. Distribution of SCN in Wisconsin from surveys done by the WDATCP and UW-Madison, Dept. of Agronomy.

Location, number of samples and percentage of samples testing positive for SCN in 2002 are shown in Figure 3. While not a completely random survey, some of the main soybean growing areas in Wisconsin were covered in the UW-SCN testing program. Based on recommendations for control of SCN, 63% of the fields tested need not change any management practices because no SCN was found. On the 30% of the fields that had SCN egg counts between 1 and 500 eggs/100 cc soil, moderate risk is indicated. In this category, growers should rotate with non-host crops, rotate with resistant soybean varieties, and rotate with tolerant or susceptible varieties when SCN numbers are low again to slow the adaptation of SCN to resistant varieties. On the remaining 10 fields that showed very high levels of SCN (>500 eggs/100 cc soil), rotation out of soybean for several years and careful selection of resistant varieties once soybean is reintroduced is highly recommended. Good survey information from the remaining soybean producing counties in the state needs to be accomplished to alert growers of the status of SCN in their counties.

Number of soil samples submitted to UW-SCN sampling program - 2002

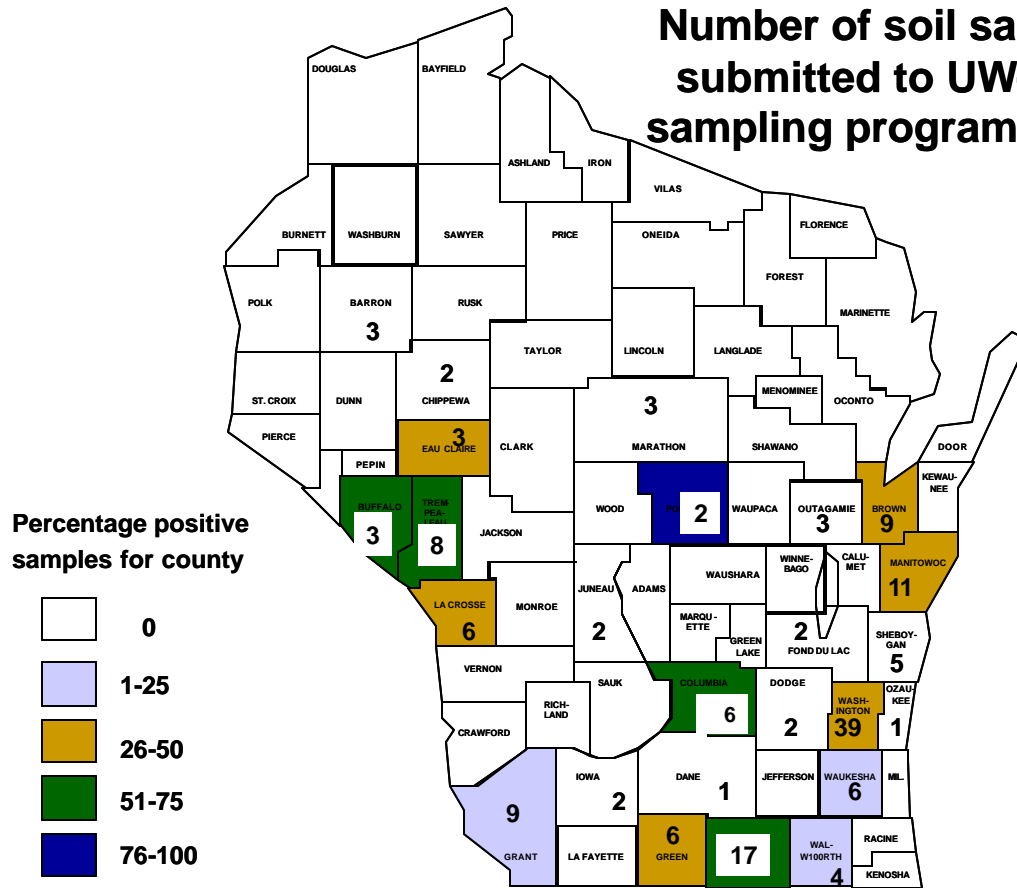


Fig 3. Number of samples (shown in each participating county) submitted to the UW-SCN soil testing program in 2002 and percentage positive samples for surveyed counties.

Other Sources of Information on SCN

UW Soybean Plant Health

www.plantpath.wisc.edu/soyhealth

North Central Soybean Research Program

www.ncsrp.com/planthealth

Online SCN Management Guide

www.extension.iastate.edu/Pages/plantpath/tylka/coalition/manguide/cover.html

National Agricultural Pest Information System

www.ceris.purdue.edu/napis/pests/scn/