

SCN Detection in Non-Infested Counties of Ontario (2006 Report)

Purpose:

Soybean cyst nematode (SCN) is often described as a “silent yield robber”. In many cases, farmers are not even aware of their losses until SCN populations have become well established in the field. Once SCN reaches this point it will continue to have long term yield implications. SCN has become the number one yield robbing disease for soybeans in Ontario. Unless SCN is managed properly it will reduce yield every year, even when visual symptoms are not obvious.

SCN symptoms are often confused with other common problems such as nutrient deficiencies, chemical injury, soil compaction, drought, flooding or root rots. SCN symptoms are also more pronounced when soybeans are under stress from drought, soil compaction, aphids, low soil fertility or other stresses. Being able to distinguish SCN from these other problems is imperative to limiting further losses from this disease.

Since the disease's first detection in 1988, surveys have proven to be irreplaceable and an effective tool in the management of SCN. Unfortunately, as with other soybean production areas around the world, soybean cyst nematode does not stop moving and will eventually spread to all soybean production areas of Ontario. In 2005 both Bruce and Brant counties were added to previous identified counties with SCN: Essex, Kent, Lambton, Elgin, Middlesex, Huron, Haldimand-Norfolk, Oxford and Peel. Early detection of SCN in new areas of the province is critical and allows OMAFRA and the OSG to target activities and implement management strategies. These activities will aid in preventing the dramatic losses in yield and quality experienced in Southwestern Ontario.

Methods:

The objectives of this 2 year project include:

- 1) Survey the remaining non-infested counties of Ontario for Soybean Cyst Nematode in 2006 and 2007 to determine the extent and population levels.
- 2) Determine the race (Hg-type) associated with these new areas and how they compare with previous identified areas.
- 3) Provide soybean breeders (private and public) with the necessary information to increase development of early maturing SCN resistant varieties.

Results:

Over 300 soil samples were collected from counties not yet identified to be infested with soybean cyst nematode (Oxford county border to the Ottawa Valley). These samples have been submitted to the Canadian Food Inspection Nematology Laboratory in Ottawa. Results will be available in March 2007. This information will update the distribution of Soybean Cyst Nematode in Ontario.

New SCN populations are developing in southwestern Ontario which are able to infect soybean varieties containing the SCN resistant gene (PI 88788). This means that new SCN resistance genes (such as Peking) would need to be incorporated into soybean varieties for these areas. Fortunately, more SCN varieties with new sources of resistance are being released to Ontario producers. The table below shows one field from Essex County and another from Chatham-Kent County. The Essex county field has had a long history of SCN and many years of SCN resistant varieties.

Growers need to rotate SCN resistant varieties since SCN will adapt to the resistance genes of the same variety planted repeatedly in the same field. Rotating varieties will help to reduce this resistance development to the same varieties. Rotating to a Peking or Hartwig source of resistance would be ideal as these become available to growers. But, until they are more accessible it is still important to avoid the resistance breakdown in PI 88788 by rotating between different SCN varieties.

SCN Population: Essex 240			SCN Population: Chat 35		
HG Type 2.5.7			HG Type 0		
Race 1			Race 3		
	Mean	FI		Mean	FI
Lee74	280		Lee74	180	
P1548402(Peking)	2	1	P1548402(Peking)	1	1
P188788	60	21	P188788	1	1
P190763	0	0	P190763	0	0
P1437654	0	0	P1437654	0	0
P1209332	41	14	P1209332	3	2
P189772	0	0	P189772	1	1
P1548361(Cloud)	125	44	P1548361(Cloud)	8	4
Pickett	2	1	Pickett	8	4

Summary:

The soybean cyst nematode (SCN), *Heterodera glycines*, can be found in all major soybean-producing countries and is the most economically significant pathogen of soybeans. Although SCN has occurred in the United States since 1954 (North Carolina), it was not identified in Ontario until 1987 when several fields near Chatham Ontario (Kent County) were found to be infested. Subsequent surveys in 1987, 1988 and 1989 found the nematode in four other southwestern Ontario counties (Essex, Lambton, Elgin and Perth). In 1995 and 1996, SCN was identified in Haldimand-Norfolk and Middlesex Counties, as a result of grower complaints of unhealthy plants. A survey targeting non-SCN infested counties in 1996 identified the nematode in Huron County. In 1999, Oxford County was found to have SCN based on field observations. In 2001, a survey of eastern Ontario was conducted in cooperation with the Canadian Food Inspection Agency (CFIA) which did not detect any soybean cyst nematode at the time. In 2003, a number of fields in Peel County (near Brampton) were confirmed to have soybean cyst nematode. These fields were displaying typical SCN symptoms (stunting, yellowing of the leaf margin, wavy field appearance, rows slow to close, weed escapes, cysts, poor nodulation, etc.). As is often the case, the severity of the symptoms and the number of cysts on the roots would indicate that the nematode had been present for a number of years (10 or more).

Bruce and Brant County were added to the list of SCN infested in 2005. The Bruce county infestation was of particular concern since for a new infested area the SCN population levels were surprisingly high (12,000 eggs per 100 grams of soil). This would indicate that SCN was not a recent introduction but as with the southwest in the late 1980s and the early 1990s, SCN infection had been misdiagnosed or gone undetected for many years. SCN will always be a major threat to soybean production in Ontario and continues to move east into the shorter season soybean production areas. It will spread to new areas of the province but with early detection and the initiation of the management strategies (resistant varieties and rotations) SCN losses can be minimized.

The 2006 SCN survey will help target these activities to any new infested areas of the province.

Next Steps:

Finish processing the SCN samples collected in 2006. Target potentially new infested areas with a more intensive survey and target these areas with extension management information.

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