

## Soybean Cyst Nematode Survey of Huron County

### Purpose:

This project investigated the distribution of soybean cyst nematode (SCN) across Huron county and educated soybean growers on the severity and importance of SCN to their farming operation.

### Background:

SCN causes the greatest yield losses of any single pathogen to soybeans in the world, causing up to 40% yield losses even before above ground symptoms are evident. SCN is a serious soybean pest that limits yield in many Ontario fields. It was first identified in Southwestern Ontario in 1988 and continues to spread into new soybean growing areas. It has now been verified as far east as Quebec (2013) and has spread north. SCN is known to be present in Huron county, however it's distribution and severity within the county are not well known. Many Huron county soybean growers do not recognize that SCN may be significantly reducing yields on their farms. Some growers consider SCN to be a problem limited to southern counties. Unfortunately, this is no longer the case.

**Figure 1. Soybean Cyst Nematodes on a soybean root. Note that they are much smaller than soybean nodules.**



### Methods:

The Huron Soil and Crop Improvement Association conducted a survey in 2013 to raise awareness of SCN within Huron County. This was part of a larger survey being conducted by Tom Welacky (Agriculture and Agri Food Canada) and OMAF to assess the population and movement of SCN and the development of SCN Hg types (races) in Ontario. Growers were asked to submit samples voluntarily to determine the presence and severity of SCN in their fields.

## Crop Advances: Field Crop Reports

It is important to know which HG groups are present in the province in order to determine if the sources of plant resistance (PI88788 and Peking) being used in Ontario soybean varieties are still effectively reducing SCN field populations and minimizing yield losses. Unfortunately in some soybean production areas in the US Midwest a dramatic shift in SCN types which can reproduce and cause yield losses on both PI88788 and Peking resistance sources (Hg SCN Type 1.2) has occurred.

### What is a SCN Hg Type?

Soybean cyst nematode populations in a field used to be identified as “races” which required growing 12 different indicator lines in soil from the suspect field. There is considerable variation in each field and inconsistencies in the “race test” results led to a new standardized test being developed called the “Hg SCN Type test”. In this test a SCN population obtained from one field is grown on a susceptible “check” variety and seven different resistance sources. The reproduction of the SCN population on the “check variety” is compared to each of the resistance sources. If the SCN field population grows well on that resistance source (10% or more than check) it is given the corresponding Hg Type number and the percentage is recorded. For example, Hg SCN Type 1 reproduces on Peking, Hg SCN Type 2 on PI88788, etc. A Hg SCN Type 1.2 population reproduces on both Peking and PI88788 genotypes. HG type 0 does not develop well on any of the resistance sources. The Hg SCN Type test better indicates the effectiveness of the various resistance sources (genes) than the old race test did as well as it takes into consideration the variability in SCN populations since every field has a unique “mix” of SCN Types (no two are the same).

### **Results / Summary:**

The results of the soil samples submitted in Huron County were surprising. Of the 130 samples only 46% resulted in none detectable SCN in the samples. Even more concerning is that 25% of the samples submitted had levels considered high (serious or dangerous) for SCN (see Table 1).

**Table 1. Huron County Soil and Crop SCN Survey 2014**

Infestation Levels	SCN Eggs/100g	% of Samples
None Detected	0	46
Minor	0-500	15
Moderate	500 – 2000	14
Serious	2000 – 6000	13
Dangerous	6000+	12
133 Samples Collected		

## Crop Advances: Field Crop Reports

It's important to note that the soil samples collected were voluntary and were not a systematic survey of all soybean fields in the county. This means that the results may not be an exact representation of the county as a whole. For instance, if every soybean field in the county had been tested the percentage of positive samples may have been different. However, it's a strong indication that SCN levels are higher in Huron County and perhaps other northern counties than had been previously suspected. Processing of the samples and Hg SCN type testing of SCN populations is still being completed.. The high occurrence of SCN in Huron County is a reminder that every soybean grower in the province should test their fields for SCN, even in regions where SCN is not considered to be widespread.

### **What about SCN resistance genes?**

The SCN resistance source PI88788 is found in 90-95% of SCN resistant varieties in Ontario. The remaining 5% comes from the Peking source of resistance. Both of these sources are very effective against SCN and although we have seen some SCN which can reproduce on both PI88788 and Peking the numbers overall in Ontario fields is very, very low based on these and other Ontario results. Both PI88788 and Peking sources of resistance not only lower SCN populations but yield much better than SCN susceptible varieties (we often see a doubling of yield with both SCN resistance genes). The PI88788 and Peking sources of resistance are still doing their job in Ontario and we want to make sure they continue to work in your fields. This has been possible through the hard work of many especially the growers. So continue to do what has been working! Keep using and rotating well-adapted SCN-resistant varieties in infested fields, try to rotate different sources of SCN resistance periodically if available for your region, and closely monitoring SCN population densities in infested fields.

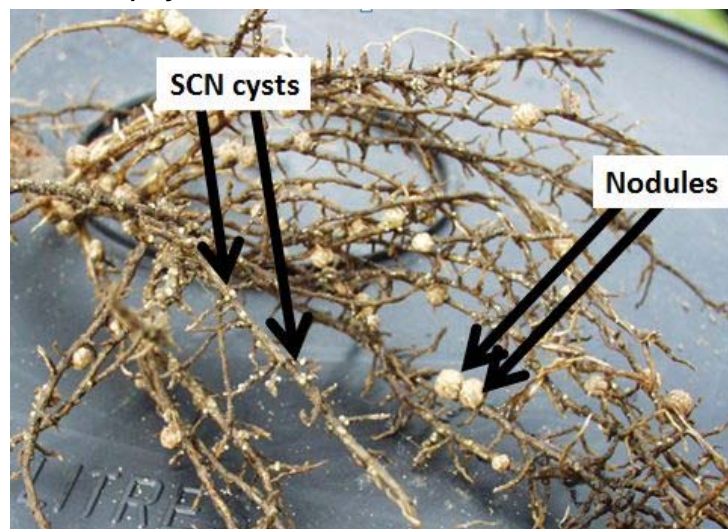
**Figure 2. Albert Tenuta (OMAF Field Crop Pathologist) and Horst Bohner (OMAF Soybean Specialist) giving an SCN talk at the Huron Soil and Crop Improvement Association twilight meeting in 2013.**



**Figure 3. Above ground soybean cyst nematode damage in Huron County.**



**Figure 4. Dig up roots, remove soil from roots and look for lemon shaped (white, yellow or brown ) cysts.**



**Next Steps:**

This project may continue in 2014.

**Acknowledgements:**

We would like to thank Tom Welacky (AAFC) and his lab for processing the field samples. We would also like to thank all those who participated by collecting and submitting soil samples.

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