

Burrus BUZZ

Delivering more than just seed

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Why all the fuss about soybean cyst nematode?

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Unfortunately, until recently, soybean cyst nematode (SCN) has not been discussed much. It is known to be the number one threat to soybean production around the world, but in the north central U.S., we have been depending on the PI 88788 source of resistance in 95% of our seed market share. A smaller percentage source of soybean resistance against SCN comes from Peking, PI 437654, or combinations. What happens when we depend on a predominate source of resistance for an extended period of time? SCN populations can adapt to the source of resistance.

Resistance is not new, as this was also documented in 2007 and 2008 by Mitchum et al. and Niblack et al., respectively. As SCN presence within soil samples are screened at the university level, the problem appears to be getting worse. There has been an increase in the number of SCN populations that can grow on PI 88788, and within these populations appears to be a greater amount of female nematodes, each of which can contain 200 to 500 eggs. Each nematode has different genes and those that are unaffected by plant resistance can pass those genes to their offspring by reproducing sexually, thus increasing the amount of SCN that are unaffected by PI 88788, read as “resistance to Race 3 and Race 14” on a bag of seed.

SCN can be difficult to diagnose because they are located within patches across a field and symptoms may not be noticeable in favorable growing seasons with adequate rain. In cases where there are high populations, SCN cysts might be visible on roots and there could be poor nodulation, uneven soybean growth, stunted plants, or low number of pods or beans per pods. Test for SCN by soil sampling and sending off sample to the [University of IL Plant Clinic](#) where they will sieve, process and do SCN egg counts!



The experimental variety on the left consists of PI 88788 source of resistance and the experimental variety on the right has no PI 88788 resistance in a Burrus research plot located near Hillview, Illinois. We plan to test all of our Burrus soybean plots for soybean cyst nematode.

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SCN Egg Count per 100cc of soil	SCN Level	Overall management plan
0	Not detected	Monitor with periodic SCN egg counts, at least every 3 rd year soybean is grown
Up to 500	Very low	Plant SCN resistant variety (can focus on higher yielding varieties) and incorporate rotation to a non-host crop into your management plan, monitor SCN egg counts
500 to 2000	Low to moderate	Plant SCN resistant variety with greater resistance and include rotation to a non-host crop into your management plan, monitor SCN egg counts after growing soybean
2000 to 5000	Moderate to high	Plant and rotate with SCN resistant varieties (most effective using resistance matched with identified SCN Type test results) and rotate to a non-host crop (each year after soybean is grown until high count decreases)
5000 and higher	High	Rotate to a non-host crop, sample for SCN egg count before returning to soybean

Table 2. Management guidelines based on fall SCN Egg Count



Thanks to University of IL for SCN populations, to demonstrate PI 88788 resistance (back plants) as well as demonstrate seed treatments such as PS SDS (ILeVO®) at New Technology Day.

Another option is to have an HG (Heterodera glycines) test on a SCN population within a field. The sample is tested against seven different soybean indicator lines that are given numbers 1-7. A female index is determined after a 30-day greenhouse test, and the average number of SCN females produced on the HG type indicator line relative to the number produced on a standard, susceptible soybean cultivar. [Recent research](#) from Iowa State University indicates that an HG test is most meaningful if a soil sample of 100 or more cores is collected throughout a field as the results of the HG type test can vary. Ultimately, the HG test can tell if you have a SCN population in your field that can reproduce on PI 88788.

The integrated management of SCN has not changed. Crop rotation to non-hosts such as corn can help, but this does not eliminate SCN populations, it just decreases the population. SCN cysts can remain in the soil for several years and when they hatch, the juveniles will migrate to the plant root, set-up feeding sites, and steal nutrients, which can result in yield loss. SCN have also been deemed the gateway for disease. There are new seed treatments (chemical, biological, and plant-health regulators), but they are not considered a standalone treatment. We have come to realize that the use of a single source of resistance is not a viable long-term strategy for managing SCN, but there is hope for new developments after the recent discovery of genes underlying SCN resistance. Learn more [here](#).