

**MN-CCA Column for The Farmer
Jan.-Feb., 2009**

Soybean cyst nematode spreading north and adapting

By Jim Boersma, CCA

Soybean cyst nematode (SCN) is spreading and changing in Minnesota.

The pest has moved into west central Minnesota and the Red River Valley. And in southern Minnesota, where it's been present since 1978, SCN appears to be adapting to the most common source of plant resistance, "PI88788."

Lately, there's been a lot of focus on soybean aphids, but growers should also pay attention to SCN, Minnesota's number-one soybean pest. Yield losses from SCN can reach 30% without obvious above-ground symptoms, especially in high-yielding environments.

SCN has been confirmed in 60 Minnesota counties, including the Red River Valley, according to Dr. Senyu Chen, University of Minnesota nematologist. Since 2004, it's been detected in Wilkin, Otter Tail, Clay and Becker counties in northwest Minnesota. Growers in these regions need to be vigilant, because SCN numbers can soar when susceptible varieties are grown in infested fields.

In 2008, for example, Pioneer Hi-Bred field staff did replicated strip trials at 25 locations in central and western Minnesota, comparing SCN-resistant and susceptible varieties grown in fields with moderate SCN infestations. Soil samples were taken at each site in the spring and again in the fall. In some locations, nematode numbers on unprotected varieties exploded from about 2,000 eggs per 100 cc of soil (about half a cup) to 25,000 eggs or more — in just one season. Across all locations, SCN-resistant varieties yielded nine bushels per acre more, on average, than non-resistant varieties.

Adapting in southern Minnesota

In southern Minnesota, many nematode populations are breaking down the leading source of SCN resistance, PI88788, Chen says.

More than 95% of the commercial SCN varieties available for Minnesota get their nematode protection from this single resistant parent. Repeated use of PI88788 varieties raises selection pressure, causing nematode populations to shift to types that can survive and reproduce on formerly resistant varieties. Now, Chen says, most SCN populations in southern Minnesota "are able to reproduce very well on PI88788 resistant varieties," lowering their effectiveness.

In 2002, Chen found that about 20% of southern Minnesota SCN populations tested were able to reproduce on PI88788 at rates greater than 10%, compared with reproduction on susceptible soybeans. Ten percent reproduction is the level where plant resistance is considered to be overcome. Just six years later, more than half of southern Minnesota SCN populations tested in 2008 were able to reproduce on PI88788, Chen says. The average rate of reproduction was about 20%.

These shifts make it harder to manage SCN-infested fields. Your goal should be to maintain good yields while keeping nematode numbers in check. Good management

includes regular scouting or soil testing, use of resistant varieties, and a proper rotation plan. Here are some tips:

- Know if SCN is present.** A convenient way to check if SCN is present in a field is to examine the roots for females in late June or early July. Your certified crop adviser can help you with scouting procedures.

- Soil sample.** Every few years, collect soil samples in the fall to determine egg numbers and monitor the success of your SCN management. In Minnesota, to maintain long-term soybean productivity in the field, you should try to hold SCN numbers under 2,000 eggs/100 cc of soil.

- Consider an HG-Type test.** If you are growing SCN-resistant varieties, but your yields are dropping, or if you have grown the same source of resistance for five years or more, Chen recommends doing an HG-Type test. This greenhouse test, formerly called a race test, will tell you if your population of nematodes has adapted to a particular source of resistance.

- Rotate to non-host crops,** such as corn or alfalfa.

- Rotate sources of resistance.** If you've been planting PI88788 varieties, switch to another source of resistance, such as PI548402 (Peking) or PI437654 (Hartwig). When you buy soybean seed, first ask your dealer or certified crop adviser what the source of SCN resistance is.

Jim Boersma is an area agronomist with Pioneer. Contact him at jim.boersma@pioneer.com. Find information and links to Minnesota certified crop advisers on the Minnesota Crop Production Retailers website, <http://www.mcpr-cca.org> – click on the MN CCA website link.

Key points

- SCN is moving into the Red River Valley.
- In southern Minnesota, SCN is reproducing on SCN-resistant varieties.
- The keys to SCN management are scouting, rotating to non-host crops, and rotating sources of SCN plant resistance.