

SCN

Manage SCN for better yields



The problem

An insidious foe, soybean cyst nematode (SCN) is widespread in Iowa and much of the Midwest. It is considered a serious yield-reducing pest because it causes so many problems.

In addition to reducing soybean yields on its own, infection by SCN gives other diseases an opportunity to take hold. That's why SCN makes other diseases, such as sudden death syndrome and brown stem rot, worse.

Managing SCN is vital. When SCN is present, yields can be reduced in many ways. The key to successful long-term management of SCN is to keep population densities in check. SCN-resistant soybeans are highly effective for managing SCN, resulting in profitable soybean yields. For Iowa growers, more than 800 SCN-resistant soybean varieties are available in maturity groups 0,1,2 and 3.

Narrow gene pool could spell trouble

SCN-resistant soybean varieties allow Iowa farmers to produce soybeans profitably in SCN-infested fields. However, a potential problem is emerging, and it's all about genetics. SCN-resistant soybean varieties possess resistance genes from breeding lines called "sources" of resistance. These breeding lines include PI 88788, Peking, PUSCN-14 and Hartwig.

No source of SCN resistance is 100 percent effective; there will always be a few SCN females that develop on the roots of SCN-resistant soybean plants. And over several years, low-level reproduction on SCN-resistant roots leads to the buildup or selection of populations of SCN in the field with an increased ability to reproduce on the resistant varieties. This is how SCN-resistant varieties become ineffective at controlling SCN; the soybean resistance genes are still present in the varieties but SCN populations shift and develop the ability to overcome the resistance genes.

For Iowa growers, nearly all SCN-resistant soybean varieties — about 98 percent, in fact — have resistance genes from the same source, called PI 88788. Fortunately, SCN resistance involves several genes, and not all resistant soybean varieties developed from PI 88788 possess the exact same combination of resistance genes.

Still, university researchers and Extension personnel are seeing increased levels of SCN reproduction on resistant soybean varieties with PI 88788 SCN resistance.

SCN is building up in the field

A soybean variety is no longer considered "resistant" by scientific standards when SCN reproduction exceeds 10 percent. And soybean yields have stayed profitable in SCN-infested fields even with increased SCN reproduction of up to 20 to 40 percent on varieties with PI 88788 SCN resistance.

However, there's no question increased SCN reproduction on resistant soybean varieties is allowing SCN numbers to build up in fields. This buildup will eventually lead to lower soybean yields from SCN-resistant varieties.



▲ SCN-resistant soybeans like these can grow tall and lush and produce profitable yields in fields infested with SCN.



▲ *SCN-resistant varieties are widely available, keep SCN population densities in check and can produce profitable yields in fields infested with the nematode.*



▲ *Soil sampling to monitor SCN population densities is an important step in managing SCN for higher yields.*

This fact sheet was prepared with information and editing from Dr. Greg Tylka, Extension nematologist, Iowa State University.

How to manage the problem

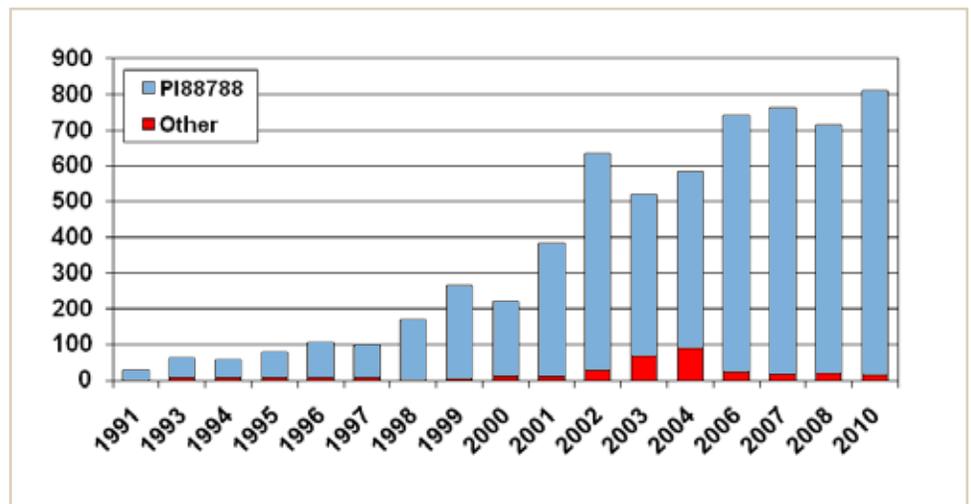
It's important to manage SCN aggressively with a variety of management approaches to deter the loss of effectiveness of SCN-resistant varieties and maintain profitable soybean yields in future years.

1. Rotate corn with SCN-resistant soybean varieties. SCN population densities decline up to 50 percent in one year of corn production in Iowa. Numbers drop even more during a second crop of corn, but thereafter, SCN numbers are very slow to decline. In Iowa, it appears that other non-host crops such as oats or alfalfa don't decrease SCN population densities any more or less than corn.

2. Use SCN-resistant soybean varieties with different sources of SCN resistance. Most SCN-resistant soybean varieties have resistance genes from PI 88788. But there are a few soybean varieties available for Iowa growers with SCN resistance from Peking and PUSCN-14.

3. Employ different SCN-resistant soybean varieties from the PI 88788 source. Four or more genes are involved in providing resistance to SCN in PI 88788. And SCN-resistant soybean varieties with PI 88788 SCN resistance do not all have the same resistance gene combinations. That means SCN population densities should not increase as quickly if several different soybean varieties with PI 88788 SCN resistance are grown in rotation as if one or a limited number of varieties with PI 88788 SCN resistance are used.

4. Remember to sample your soil. Collect soil samples every four to six years and get an SCN egg count to determine if SCN numbers are increasing, staying the same or decreasing in infested fields.



▲ *The number of SCN-resistant soybean varieties available to Iowa growers and the proportion with SCN resistance from PI 88788, 1991 to 2010.*

