



Diagnostic Facts



Diagnostic Services
Michigan State University

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Soybean Cyst Nematode

Angela Tenney, Diagnostic Services
Fred Warner, Diagnostic Services
Jackie Smith, Diagnostic Services

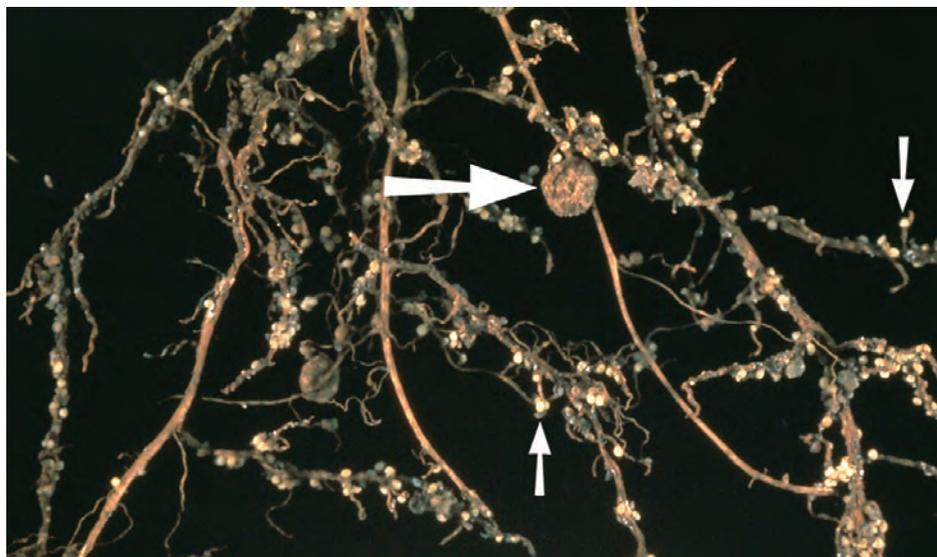
The soybean cyst nematode (SCN) is a major limiting factor in Michigan soybean production. This nematode was first detected in Michigan in 1987. SCN is known to exist in almost all of Michigan's major soybean producing counties. SCN infestations can result in poor stands, stunted plants, yellow foliage and low soybean yields. Losses can range from 5-90% of the yield potential. It is imperative for all Michigan soybean growers to have a well-developed strategy to avoid SCN problems or to minimize impacts if SCN is already present.

It is a problem for soybean producers as well as a regulatory concern for growers wishing to export seed or plant material to other states or countries. Many states and other countries will not accept seed or plant material unless it is certified SCN free. It is important that growers using land that has been previously planted to soybeans have their fields sampled routinely if they wish to export seed or plant material.

Biology and Symptoms

Soybean cyst nematode is a microscopic, plant-parasitic roundworm that lives in the soil and feeds on the root system of its host plant. SCN has 3 major life stages: egg, juvenile and adult. Juvenile stages feed on the roots as they continue to develop into either

adult males or females. Common above ground symptoms of SCN are stunted plants and the yellowing of foliage. These symptoms usually appear in circular or oblong patterns within the field. SCN symptoms can be similar to



Soybean root system displaying nodules (large arrow) and cysts (small arrows).

those of nutrient deficiencies or soil compaction. SCN females can be observed on the root systems of soybeans around 45 days after planting. They are small white spheres about the size of the head of a pin and are found attached to the root systems of the host plant. As the females mature, they turn brown and become a protective cyst for their eggs that can remain viable in the soil for many years. Each cyst may contain

up to several hundred eggs that will eventually hatch when a suitable host is present. SCN hosts are mainly legumes such as soybeans, dry beans and snap beans but it has also been known to survive on some winter annual weed species.

Monitoring and Sampling

Monitoring for SCN is an essential part of nematode management. All fields in Michigan should be routinely sampled for nematodes, preferably every fall before soybeans are planted. Early detection is critical to avoid drastic yield losses and high population densities of SCN. Sampling for SCN and other plant-parasitic nematodes is described in MSU AG Facts Bulletin E-2199, Detecting and Avoiding Nematode Problems. Samples consisting of roots, soil or both can be submitted to Diagnostic Services at Michigan State University for nematode analyses.

SCN Management

SCN is extremely small. On its own, within-field spread of the nematode will only be about an inch per year. However, SCN can be transported over long distances in soil associated with crop transplants (e.g., tomato, strawberry, ornamentals), on machinery, animals and with seed. Because SCN occurs in the soil, it is important to keep the movement of soil to a minimum. Fields without SCN should always be worked and harvested before infested fields. To minimize the spread of SCN, equipment should always be washed free of soil after working in SCN-infested fields.

Nematode population reduction is the strategy used for minimizing risks in fields infested with SCN. Once a field is infested with SCN it is virtually impossible to eradicate. Cysts can remain viable in the soil for many years until the proper hatching conditions occur. If SCN is present in a field, the objective in most situations is to reduce the population density. This can be achieved by growing non-host crops, maintaining good weed management and incorporating SCN-resistant soybean

varieties into cropping schemes. Currently, there are a very limited number of nematicides registered for control of SCN and the economics of nematicide use for control of this pest in Michigan has not been justified. Recommendations for SCN management will vary depending on population densities and the production needs of the grower. When samples are submitted to Diagnostic Services at Michigan State University, a nematode diagnostician will provide recommendations to growers to assist them in implementing appropriate SCN management strategies.

Michigan Soybean Cyst Nematode Distribution

(Year of detection listed within the county.)

Note: To date, the Upper Peninsula has had no detection of SCN)

