Sugarbeet cyst nematode (SBCN) is a microscopic plant parasitic worm that can cause significant reductions in yield. It was first described in 1859 in Germany and is distributed worldwide. In the United States, SBCN was first reported in Utah in 1895 and is present in all sugarbeet-producing states except Minnesota and eastern North Dakota. Growers and allied industry representatives need to become aware of the problems caused by SBCN and know how to identify its signs and symptoms to help prevent its entry into Minnesota and eastern North Dakota and to report its presence if found in sugarbeet fields.

**Symptoms**

**FIELD**

In sugarbeet fields, SBCN infestation initially appears as circular to oval areas of stunted plants. Infested plants tend to become pale yellow and wilt, especially in the afternoons of warm and sunny days (Figure 1).

**PLANT**

Symptoms on plant vary based on growth stage at the time of infection. When seedlings are infected, symptoms include stunting and reduced leaf growth, and older outer leaves become yellow and wilted during the hot period of the day. The taproot tends to be stunted with fibrous “bearded roots,” somewhat similar in appearance to plants with Rhizomania. When older sugarbeet plants are infected by SBCN, symptoms may not be noticeable.

The most important confirmation of SBCN infection is the presence of white to yellow lemon-shaped females attached to feeder roots (Figure 2) or yellow-brown cysts (dead mature females) (Figure 3) in soil.

**Life Cycle and Survival**

The causal agent is *Heterodera schachtii*. The nematode survives in the soil as cysts that contain eggs and juveniles (Figure 4). Under favorable conditions—warm temperatures (70 to 81 degrees F) and sufficient soil moisture—and the presence of root exudate from hosts, second-stage juveniles hatch from eggs, enter the root tissue, and move to cortical tissues where they feed. After development to
Sugarbeet Cyst Nematode

Distribution and Spread
SBCN is a soilborne pest, so anything that can move soil will move the nematode. Cysts can be spread by machinery, animals, water and tare soil from harvested beets. In the soil profile, cysts can be found from the surface to 24 inches deep, but the highest numbers are found in the root zone (2 to 10 inches soil depth).

Host Range
Sugarbeet cyst nematode can infect more than 200 plant species, including sugarbeet, garden beet, table beet and canola. It can also survive on common weeds, such as wild mustard, pigweed, lambsquarters, shepherdspurse and purslane.

Management

PREVENTION

- **Use an integrated system** to prevent or delay the introduction of SBCN into areas where it has not been reported. This will include avoidance of, or limited use of, host crops in the rotation; good control of weed hosts; avoiding use of machinery and equipment from areas with known SBCN problems; and thoroughly washing used machinery and equipment if coming from areas with SBCN problems. Use proper sanitation/sterilization measures after visiting areas with known SBCN problems and then visiting fields which do not have this pest.

  In areas where SBCN was reported, its population should be reduced below the economic threshold level by following different management methods.

- **Plant SBCN tolerant cultivars** which are available, but be aware of their susceptibility to other diseases, including Cercospora and Rhizoctonia root rot.

- **Rotation with non-host crops**, including wheat, barley, corn, bean, potato and alfalfa. Three- to four-year rotation is needed in heavily infested fields; rotations with non-host may reduce initial SBCN population by 40-60 percent in a year.

- **Plant trap crops** which attract SBCN, but do not allow them to develop and reproduce. Some SBCN-tolerant cultivars of oil seed radish (Defender, Image and Colonel) and white mustard are effective.

- **Early planting** when soil temperatures are not favorable (< 59 degrees F) for infection by SBCN.

- **Control weeds** that are hosts for SBCN in sugarbeet and rotation crops.

- **Avoid returning tare soil with SBCN to fields** in which sugarbeet is grown.

- **Some nematicides may be effective, but are typically difficult to apply and may be uneconomical.** Biological seed treatment which utilize spores of *Pasteuria nishizawai* may help to manage SBCN on tolerant sugarbeet varieties.

**References**

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