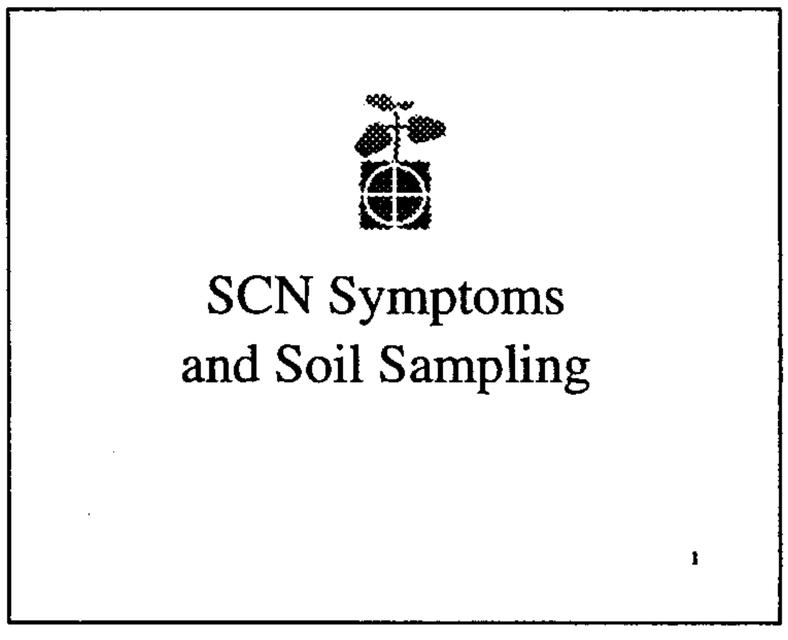
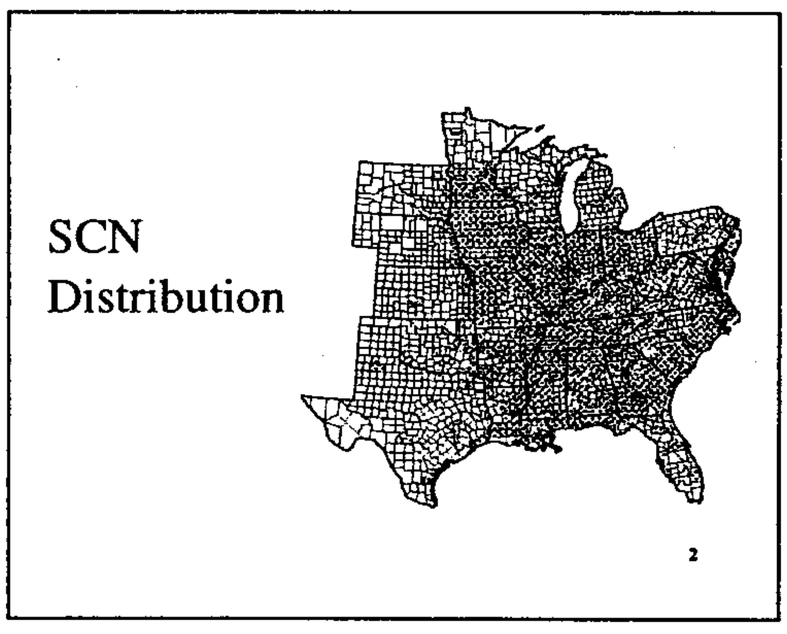
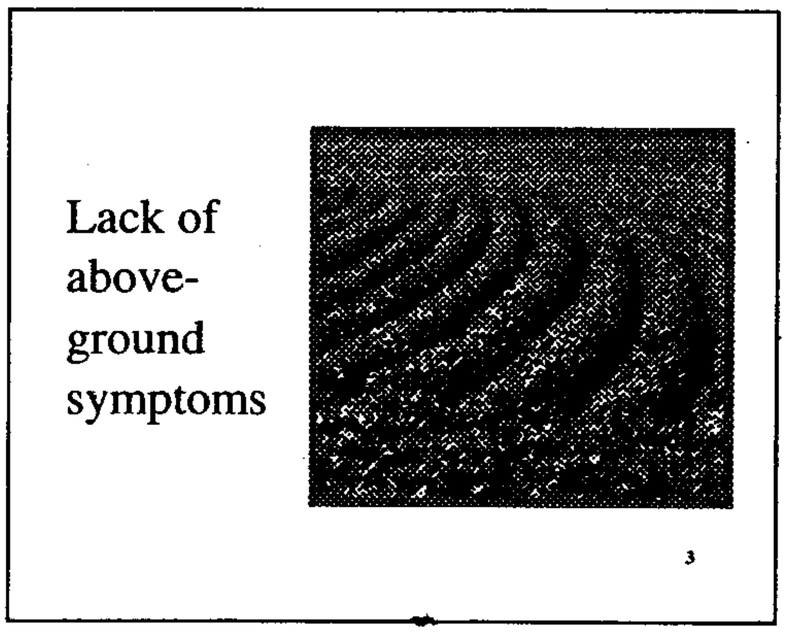
SCN Symptoms and Sampling Slide Series

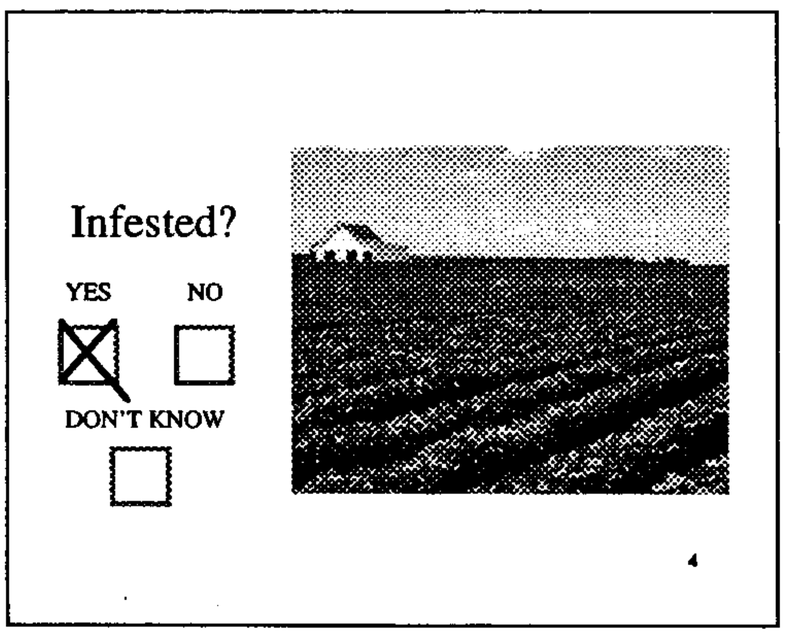




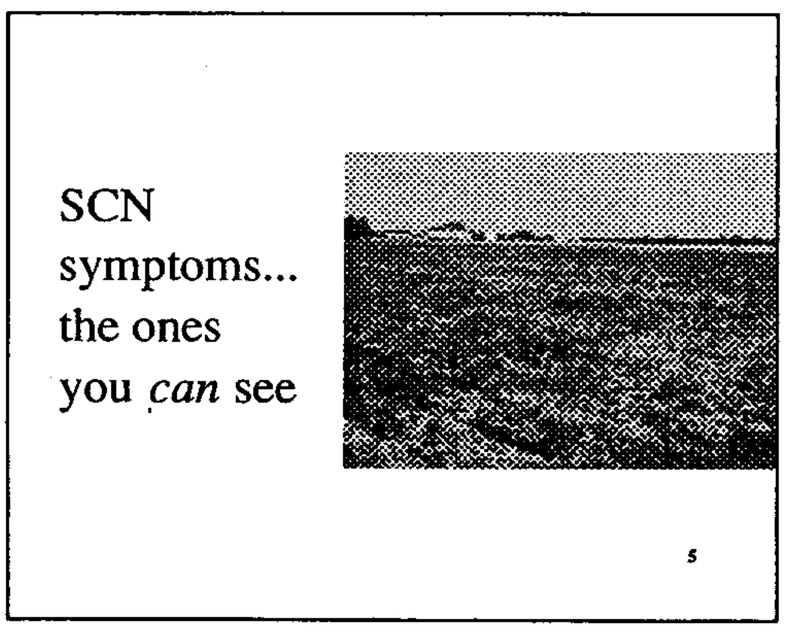
Soybean cyst nematode, or SCN, is the most important soybean pest in the Midwest. SCN occurs throughout the Midwest and is widespread in every major soybean-producing state. SCN is a perennial problem to soybean farmers. Each year producers lose profits to SCN. In 1997, soybean cyst nematode reduced soybean yields by 209 million bushels.



SCN often is a "silent" partner in soybean production, stealing 15%, 25% and up to 40% of your yield without you ever seeing an above-ground disease symptom. Soybean cyst nematode cannot be eliminated but proper management can maximize yields and minimize SCN reproduction.

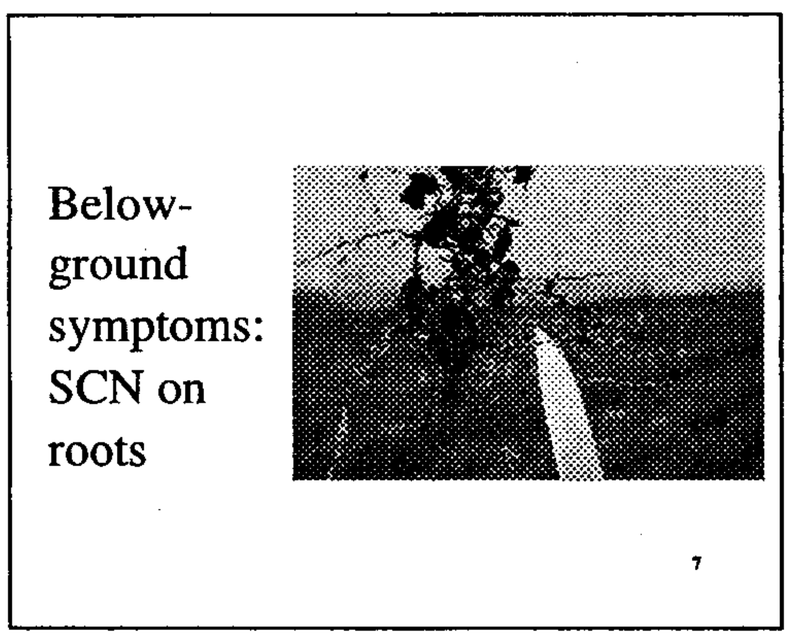


Just from looking at it, you couldn't tell that this field is infested with soybean cyst nematode. The universal above-ground symptom of SCN is yield loss. The crops may look good but the plants are producing fewer pods and smaller seeds than they should, due to SCN. This is not a symptom you'd easily see while scouting your field. When soil moisture is optimum and soil fertility high, above-ground symptoms may be rare.

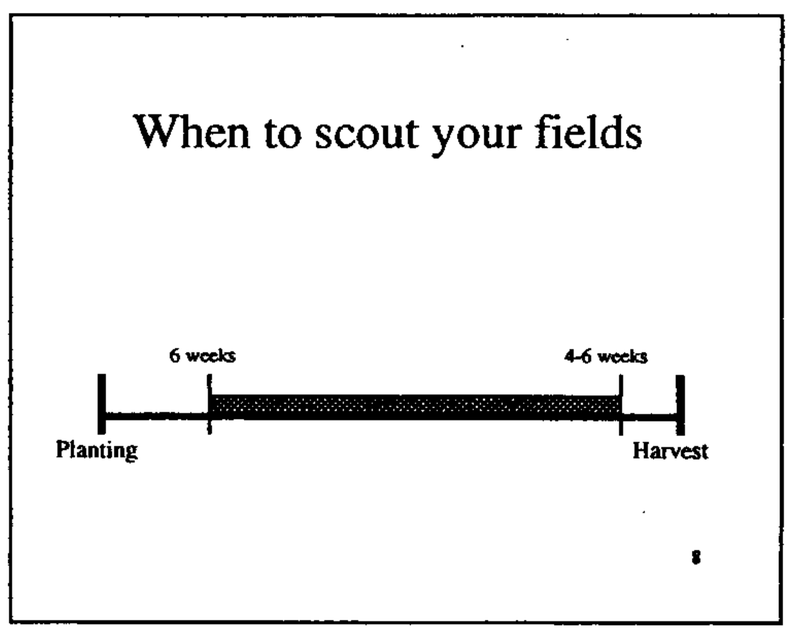


These are the textbook above-ground symptoms of SCN – stunted and yellow plants, resulting in poor canopy closure. These symptoms are most visible on light, sandy soils where moisture stress is common or on heavier soils in years when rainfall and soil moisture are low. On heavier soils, you may only observe these symptoms when SCN population densities are extremely high. Don't wait to see these symptoms before you test. Soybean cyst nematode numbers will increase in infested fields over time if management practices are not adopted.

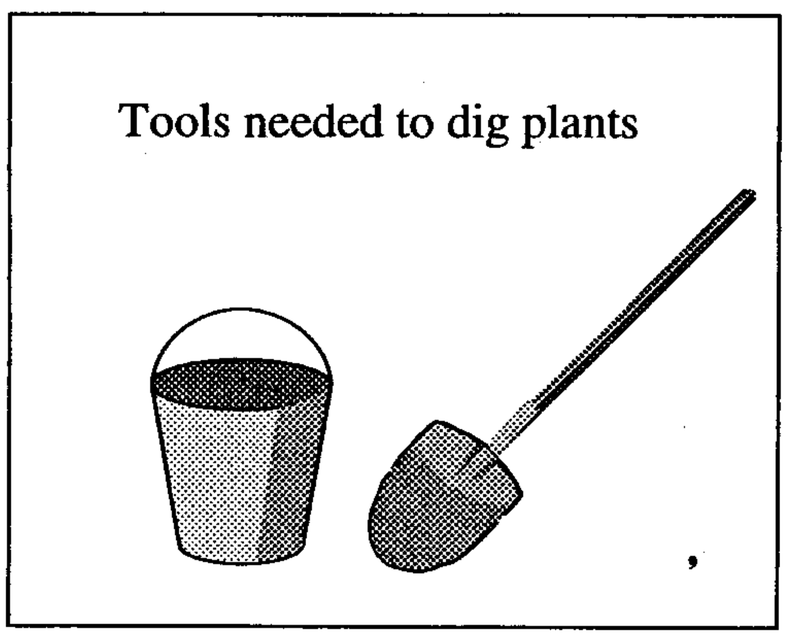
You can't always count on seeing those above-ground symptoms. The bean variety on the left side of the field is susceptible; the variety on the right side is resistant. The beans on the left – the susceptible variety – are slightly stunted but not noticeably yellow. You might even attribute what you see to varietal differences, not to disease. But at harvest the effect of SCN can be seen clearly. The susceptible beans yielded just 24 bushels per acre compared to 39 bushels per acre for the resistant varieties. A difference of **15 bushels per acre**, without any dramatic symptoms of SCN. That's a lot of lost profit.



Soybean cyst nematode may be best diagnosed by below-ground symptoms and signs. The surest indication of SCN is the presence of females and cysts on the roots. Adult SCN females can be seen with the naked eye. The small, white or yellow, lemon-shaped females are about the size of a period at the end of a printed sentence. Other below-ground symptoms include stunted root systems, fewer nitrogen-fixing nodules and an increased incidence of root diseases.

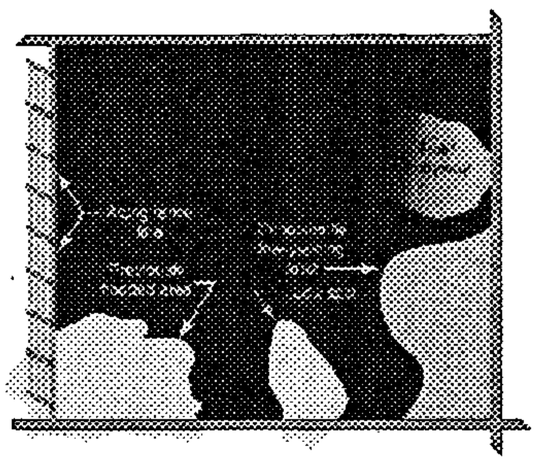


You can scout your fields for SCN by digging plants as early as six weeks after planting, through the growing season, and up until four to six weeks before harvest.



The equipment for digging plants is common – a shovel or hand trowel and bucket of water. A magnifying glass might be helpful, too. You probably have everything you need in your barn or shed.

SCN "hot spots"



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Use your shovel to dig up a soybean plant in a suspected area – near a field entrance, areas that had been flooded at one time, along the fences, areas where weed control isn't quite as good, and areas where the bean yield seemed a little low last time. Dig at least 6 to 8 inches away from the plant stem to make sure you haven't cut off much of the root system. Never try to pull up a plant to see SCN. You'll lose too much of the root system and strip off the nematodes as you pull the roots through the soil.

Once you have the plant in hand:

- Shake excess soil from roots
- Soak roots in bucket of water
- Allow soil to soak off roots
- Let roots dry for a few minutes

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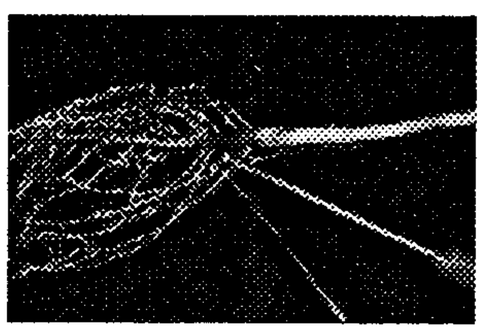
Gently shake excess soil from the root system. If the soil is heavy, or if a lot of soil is still clinging to the roots, you may want to soak the root system in a bucket of water for a few minutes. Allow the soil to gently soak off the roots, then let the roots dry for a few minutes.

Check root system for adult SCN females



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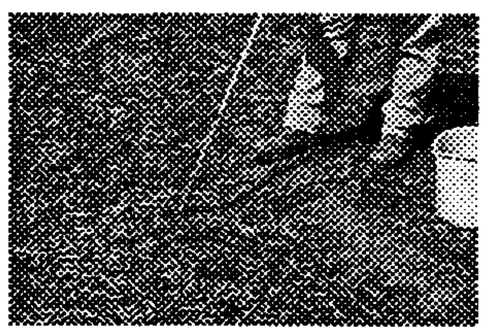
Check the root system for adult SCN females. They will be small, a lot smaller than the nitrogen-fixing nodules. The females will be white or light yellow and lemon-shaped. The surface of the adult SCN females is smoother than the root surface and SCN females will be easier to see if the root has dried somewhat. You'll be able to spot females better on plants grown in dark soils than in light soils.

Know for sure with a soil test



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If, when scouting your fields, you found SCN females on the roots or if you weren't able to find females but still suspect soybean cyst nematode is present, you'll be wise to take a soil test. It's the best way to determine if SCN is present. In addition to confirming whether SCN exists in your soil, you will get an estimate of SCN population density in your field and guidelines for SCN management.

Equipment for soil sampling

- Soil probe
- Bucket
- Plastic bag or plastic-lined soil bag

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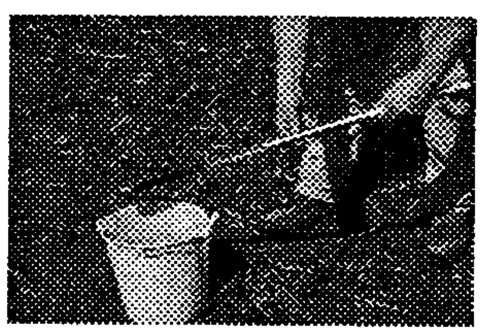
As with root digging, you probably already have the equipment you need for sampling soil for SCN. You'll use the same equipment used in taking a sample for soil nutrient analysis: a soil probe, a bucket, and a plastic or plastic-lined paper soil bag.

Fall is the best time to sample soil for SCN



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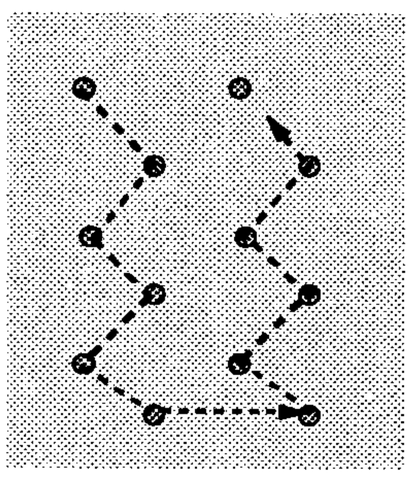
You can take a soil sample for SCN testing at almost any time of the year. Generally avoid sampling frozen or saturated soil, since these samples are more difficult to process, which may affect the accuracy of the results. Fall is often the best time to sample. As you review harvest data and plan for the next crop year, make note of fields or areas within fields where yield was lower than expected. These are the fields or areas you should test for SCN.

Use a zigzag pattern when collecting soil cores



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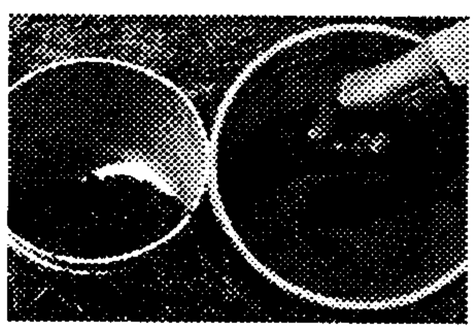
Sample the top 6 to 8 inches of soil. You'll want to take 10 to 20 cores in a 10- to 20-acre area. If the field is larger, break the field into 10- to 20-acre units and take 10 to 20 cores per unit. SCN is tiny, not uniformly distributed and doesn't move far on its own. Consequently, population densities are extremely variable and SCN infestation can be missed in a field. The more cores you take, the better the estimate of SCN population density across the field will be.

Mix soil cores in bucket



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Bulk the cores in a container and mix throughly. Take time to mix the sample. The better the sample is mixed, the better the sample will represent the sampled area.

Label soil sample

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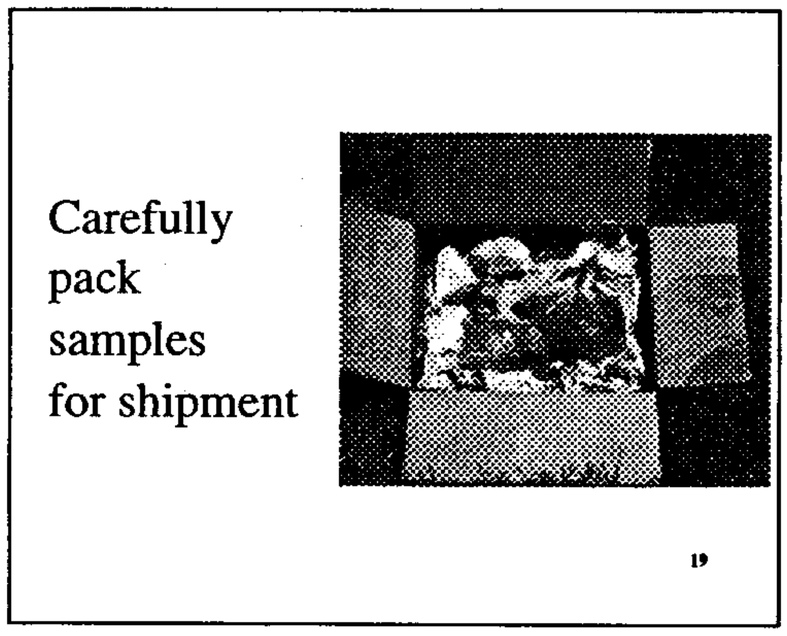
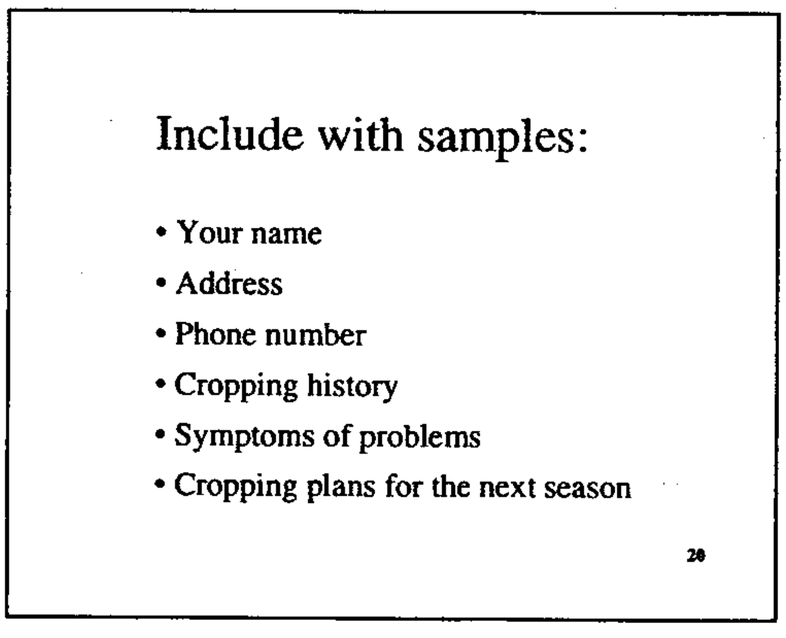
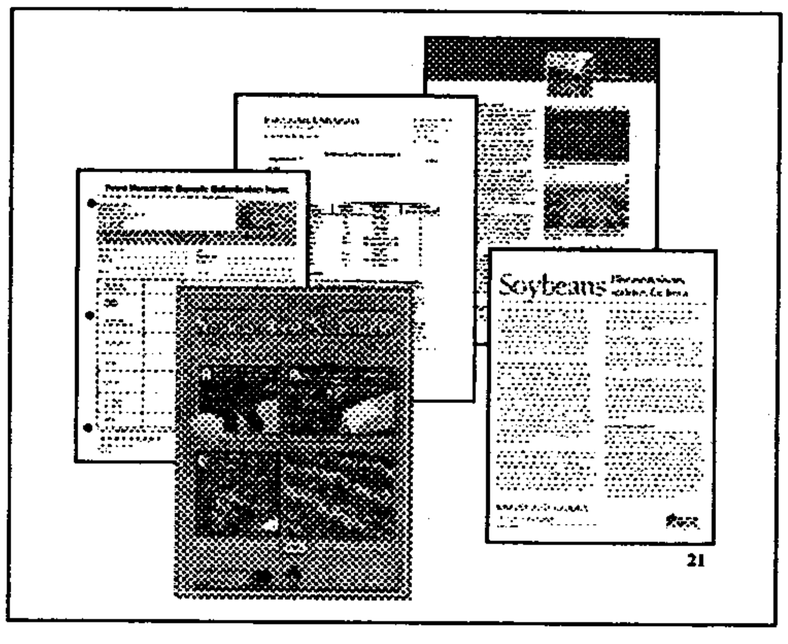
Put 1 to 2 pints of the thoroughly mixed soil in a sample bag and label it with an indelible marker. Don't put a paper label inside the bag; the moist soil will make the label unreadable by the time the sample reaches the lab. The sample doesn't require any special handling. You'll want to keep the sample at room or field temperatures. Keep the sample out of the sun or a hot truck cab until you are ready to pack and ship it.



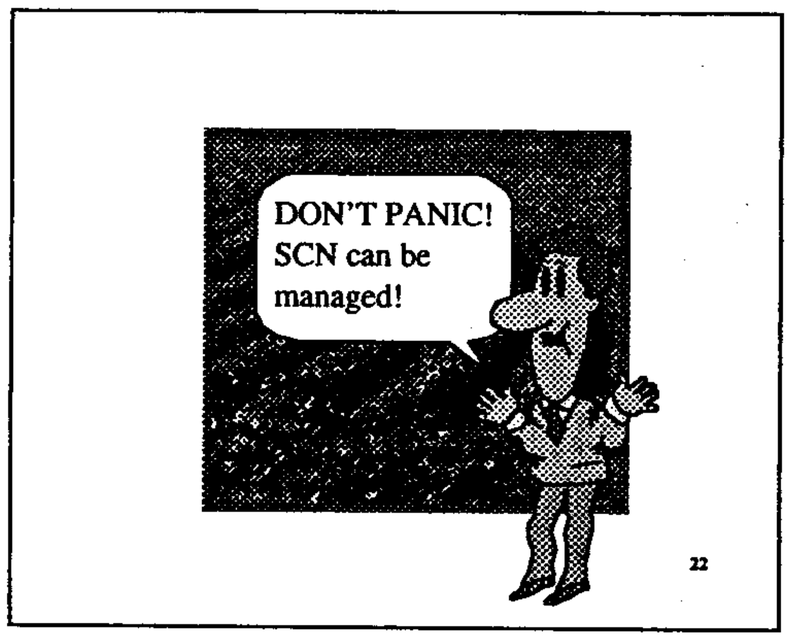
Pack the samples in a box for shipment to a lab which performs nematode analysis. Most states have a University or Extension plant diagnostic clinic or nematologist who can test the sample for SCN. Some private soil fertility labs also offer SCN testing, but not all soil fertility test labs are trained to test for SCN. Make sure your lab can test for SCN before shipping the sample. Cushion the samples with packing material so bags don't break open during shipping.



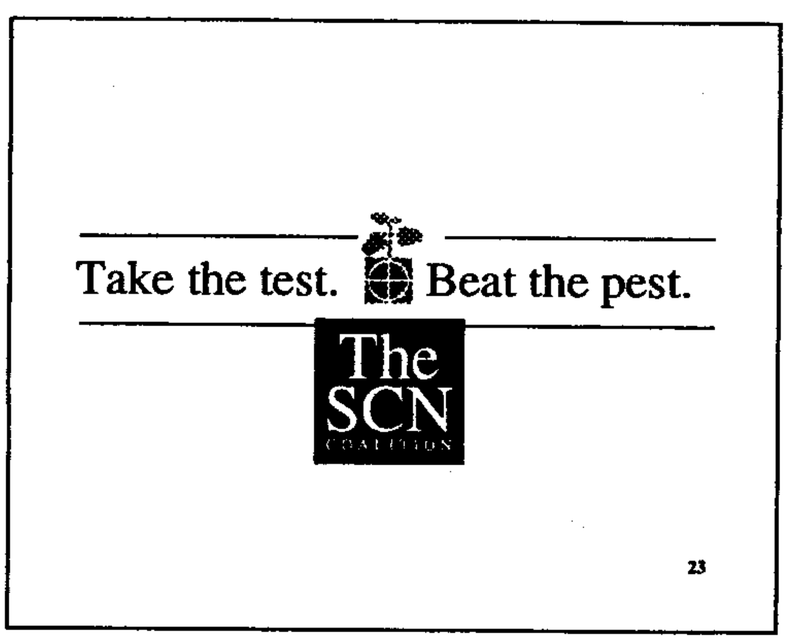
Make sure you include your name, address and phone number with your sample. Also include the field location or designation, a cropping history of the field, symptoms or problems observed, and cropping plans for the next season, all of which are helpful in making management recommendations if SCN is confirmed.



When the test has been completed, you'll receive an estimate of SCN population density based upon a given volume of soil. Often 100 cc of soil is the standard volume used, but depending on the lab, your sample results may be based on 200 cc, 250 cc or even on a cup or a half-cup of soil. Note the soil volume as a base of comparison of results between labs. Also note how SCN numbers are reported. Many labs report SCN eggs, or eggs and juveniles per volume of soil, while other labs report the number of cysts. Cyst and egg counts are not directly comparable. Keep in mind that a low cyst count does not equal a low egg count since each cyst can contain hundreds of eggs. Extension and coalition personnel can help explain your test results and make management recommendations based on those results.



Damage from SCN is not always obvious in a field. The best way to know if you have soybean cyst nematode is to take a soil sample and have it tested. If you learn that you have SCN, don't panic. Although SCN is serious soybean pest, it can be managed and managed profitably.



Before you can beat the pest, you must take the test.