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Sampling Strip Trials for Corn Nematodes

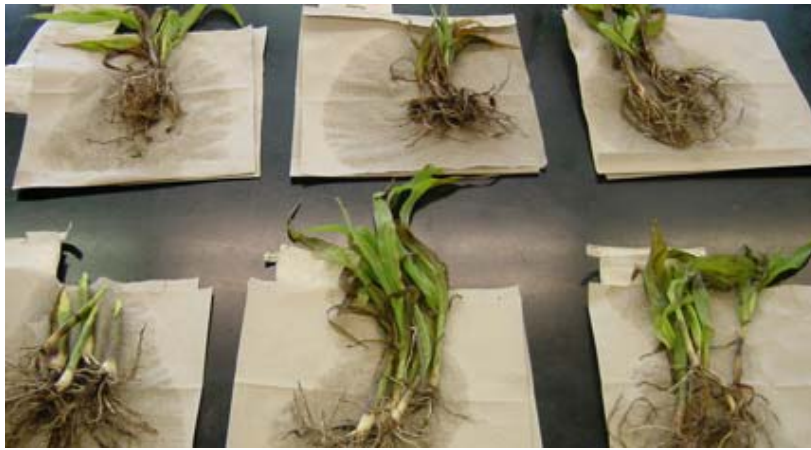
By Greg Tylka, Department of Plant Pathology

Many people currently are asking how to collect nematode samples from strip trials of corn treated with new seed-treatment nematicide products. Avicta® Complete Corn and Votivo™ are the two products commonly being compared.

Avicta® Complete Corn, which was widely available to corn producers for the first time in 2010, is a combination of the Avicta seed treatment nematicide (active ingredient abamectin), a seed treatment insecticide and three seed treatment fungicides. Votivo™ is a biological seed treatment containing the bacterium *Bacillus firmus* that will be available in 2011.

There are no clear guidelines on how to collect samples for nematodes to compare treatments in strip trials. But here are some points to consider.

- **The new seed-treatment nematicides provide early season, not season-long, nematode protection;** duration of protection is not specified or known. Differences in nematode numbers due to the nematicides may occur early in the season (four to six weeks after planting), when the nematicides are having an effect, and not later in the growing season.
- **There are [many different species of corn nematodes](#) and they vary in their generation times.** For example, the root-lesion nematode can complete a generation in 30 to 50 days; dagger nematode will have only one generation in an entire growing season. The likelihood of detecting a difference in nematode numbers among treatments depends on what nematodes are present in the field and when the nematode samples are taken. It is unlikely that there will be any difference in nematode numbers detected among treatments in samples collected four to six weeks after planting if the predominant plant-parasitic nematodes in the field are those with long generation times like the dagger nematode.
- **Populations of plant-parasitic nematodes are extremely variable in fields.** Even when consistent sampling methods are used across strips, nematode numbers from the samples will be highly variable. To determine if a treatment is having any consistent effect on nematode numbers, it is critically important to collect numerous sets of samples across strips of treatments and to compare numbers from all samples. One set of numbers from one set of samples collected across strips will not provide any useful information.
- **Soil and root samples should be collected to assess nematode numbers.** Roots are needed because some plant-parasitic nematodes feed almost entirely inside corn roots during the growing season; their numbers can be deceptively low in the soil. Whole plants can be submitted if plants are relatively small (see image); otherwise, root balls should be submitted.



Collect several plants or root balls from each sampling area or “plot” so nematodes can be extracted from root tissue.

- **It is difficult to determine where to collect samples from strips.** One suggested method is to collect 20 12-inch-deep soil cores and a few plants or root-balls from a four- or eight-row wide by 25- to 50-foot-long area of each strip. The sampled area will serve somewhat like a plot for each treatment. Collect sets of samples from “plots” in a straight line (or transect) across the various treatments in the strips. Ideal places to locate the transects in the field would include: 1) areas suspected of having damaging nematode populations, 2) areas where there is poor corn growth and 3) areas with uniform soil conditions (and hopefully uniform nematode populations).

- **[Soils with higher than 70 percent sand content can be infested with needle and sting nematodes](#)**, and these nematodes are difficult to recover in samples collected in the middle of the growing season. If needle and sting nematode infestations are suspected, collect soil samples from strip trials within the first four to eight weeks of the season. There’s no need to collect root samples for these nematodes as both species exist exclusively in the soil.

Greg Tylka is a professor of plant pathology with extension and research responsibilities in management of plant-parasitic nematodes.

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