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Speed sampling for soybean aphids

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Abstract
The soybean aphid is not making much of an impression in Iowa this July. Reports from across the state indicate that aphids can be found in soybeans but populations are mostly small and very scattered. Recently I had several participants at a field training school ask about the Minnesota speed sampling procedure for soybean aphids. This method was developed by Erin Hodgson, Department of Entomology, University of Minnesota. It is still being refined with additional research being collected this year.

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A soybean stem showing approximately 113 aphids being tended by an ant.

Enlarge [1]

Recently I had several participants at a field training school ask about the Minnesota speed sampling procedure for soybean aphids. This method was developed by Erin Hodgson, Department of Entomology, University of Minnesota. It is still being refined with additional research being collected this year. However, field scouts may find it to be a useful technique; therefore, with Erin's permission, I have included some of the basic information here. You will need to consult her Web page (listed below) to obtain a copy of the field worksheet. The speed sampling technique is dedicated to improving sampling efficiency for the soybean aphid, and it may have value for field scouts in Iowa.

How many samples are needed to make a treatment decision?

1. After collecting data from commercial soybean fields in southern and central Minnesota, entomologists at the University of Minnesota developed a "binomial" sampling plan, called Speed Scouting for Soybean Aphid. We recommend using this sampling plan through the pod fill stage.

2. A binomial plan usually refers to two choices; sometimes it means a presence/absence count or a preset cut-off number where counting can be stopped.

3. A binomial sampling plan can improve the cost (in time) of sampling because every insect does not need to be counted.

4. The binomial sampling cut-off point is 40 aphids per plant. If a plant has less than 40 aphids, consider it non-infested; however, if the plant has 40 or more aphids (remember,

counting additional aphids is not necessary after 40), consider the plant infested.

5. Based on the Speed Scouting sampling plan, three treatment decisions are possible:

- Do not treat that field,
- Treat that field, or
- Resample that field in 3-4 days

6. Are you interested in trying the Speed Scouting technique for 2004? We prepared a printable worksheet with directions you can use to make a treatment decision for soybean aphid. A blank worksheet can be downloaded [2].

What is the purpose of speed sampling for soybean aphids?

The purpose of this proposed sampling plan is to improve efficiency when making management decisions for soybean aphid. Speed sampling does not require counting every aphid on a plant, and treatment decisions can be made quickly--especially at very high or very low aphid densities.

How did we collect these data?

Since 2001, 10 commercial soybean fields (all with 30" row spacing) in the southeast quarter of Minnesota were sampled very intensively. Fields were sampled like a checkerboard, where all areas of the field were sampled 1-2 times per week. All of the fields were colonized early (vegetative growth) by soybean aphid. Fields were sampled with whole plant counts from the early vegetative stage through seed set. In all, almost 90 data sets were collected and used as a base to create this sampling plan. Computer software analysis was then able to tell us approximately how many samples were needed to make correct treat and no-treat decisions based on the proportion of infested plants.

Is this the new economic threshold for soybean aphid?

No, this is *not* a new economic threshold! The current recommended economic threshold for soybean aphid is 250 aphids/plant through pod set for most Midwestern soybean. This sampling plan uses the percent infested plants (at least 40 aphids on a plant is considered infested) as an indicator of damaging soybean aphid populations.

Why stop counting after 40 aphids per plant?

Using 40 aphids is a cut-off point where you can stop counting and consider the plant infested. There is a statistical relationship between the economic threshold (250 aphids per plant) and the proportion of plants that are infested (we are using 40 aphids per plant). For example: 0-39 aphids on a plant = not infested, and 40 or more aphids on a plant = infested.

Where and when can you use this sampling plan?

This sampling plan was created and intended for use for commercial soybeans in central and southern Minnesota. Because data were not collected past seed set, we are recommending using this plan up to pod set on fields with 30" rows.

When can you start using this sampling plan?

For the majority of soybean grown in the lower half of Minnesota, we recommend starting to scout in the early vegetative stages (mid- to late June). Depending on weather and other growing conditions favorable for aphid growth, it may require 2-3 visits per field each year to determine soybean aphid densities and make treatment decisions.

Do you need to resample that field and if so, when should you return?

Regardless of the treatment decision, the field should be resampled in 7-10 days through pod set to ensure soybean aphid populations are not at damaging levels. A treated field can have new aphids move into the field, and it is important to check as often as time permits.

If you have specific questions about speed sampling for aphids, you may contact Erin at hodgs005@umn.edu [3] or call 612-624-8478.

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