

Smart Farming: Using data to make decisions

Soybean Aphid Speed Scouting (III.A.i.)

(Adapted from Erin Hodgson, 5/2004)

How many samples are needed to make a treatment decision?

After collecting data from commercial soybean fields, entomologists at the University of Minnesota developed a binomial sampling plan, called Speed Scouting for the Soybean Aphid. It is recommended to use this scouting technique through the pod fill stage. A binomial plan refers to two choices; sometimes it means the presence/absence count or a pre-set cut-off number where counting can be stopped. This method can improve the cost (in time) of sampling because every insect does not need to be counted. The binomial cut-off is 40 aphids per plant. If a plant has less than 40 aphids, consider it non-infested; however, if the plant has more 40 or more aphids (remember, counting additional aphids is not necessary after 40), consider the plant infested. Based on the Speed Counting sampling plan, three treatment decisions are possible:

1. Do not treat the field
2. Treat the field
3. Resample in 3-4 days

Materials

Soybean Plot or Field

Sample 1 Speed Counting Worksheet

Sample 2 Speed Counting Worksheet

Sample 3 Speed Counting Worksheet

Procedure

1. Go to the first plant at random. IF less than 40 aphids are on the entire plant, mark a minus (-) for that non-infested plant. If at least 40 aphids are on the plant (STOP COUNTING when you reach 40 – this is the speedy part), mark a plus (+) for that infested plant.
2. Choose a direction at random and walk 30 rows or paces to the next plant.
3. Repeat step #1 until 11 plants are sampled in different areas of the field.
4. Make a decision using the total number of infested plants (the total number of pluses).
5. If you must continue sampling (you found only 7-10 plants with a +), sample 5 more plants and use the new total number of plants (16) to make a decision. (see sample sheet)
6. If no decision is reached, sample additional sets of 5 plants until 31 plants are sampled. Remember, always use the total number of plants to make a decision.
7. If no decision can be made after sampling 31 plants, resample the same field in 3-4 days.
8. A 'TREAT' decision must be confirmed a second time 3-4 days later. If confirmed, apply insecticide in 3-4 days.

Reflection

1. Why do you think that the cut-off is only 40 aphids per plant when the economic threshold is 250 aphids per plant?
2. If the aphid population can double in 2-3 days' time, how long would it take for an aphid population to reach the economic threshold of 250 if it doubled on an average of 2.5 day?
3. Why is it necessary to resample in 3-4 days' time in order to confirm pesticide use? Why should you resample in 7-10 days if your sample indicates a 'No Treat' status?

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