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Scouting Recommendations for Soybean Aphid Aphis glycines Management

Abstract
Anyone who has tried to count the entire number of aphids on a single plant when populations are high can appreciate the need for a more time-efficient method of estimating aphid densities. One of the treatments in this study was designed to evaluate the speed scouting system developed at the University of Minnesota. (For more information see www.soybeans.umn.edu/crop/insects/aphid/aphi d_sampling.htm.). The speed scouting technique is a binary system in which a plant receives a score of either a '+'(more than 40 aphids/ plant) or a '-'(fewer than 40 aphids/plant). Using this system, there is never any need to count more than 40 aphids/plant. After accessing a number of plants(either + or -), a decision is made based on a sequential plant sampling. Under heavy aphid populations, this technique results in significantly fewer aphids being counted as compared with the 250 aphids/plant threshold.

Keywords
Entomology

Disciplines
Agricultural Science | Agriculture | Entomology

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Scouting Recommendations for Soybean Aphid *Aphis glycines* Management

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Introduction

Anyone who has tried to count the entire number of aphids on a single plant when populations are high can appreciate the need for a more time-efficient method of estimating aphid densities. One of the treatments in this study was designed to evaluate the speed scouting system developed at the University of Minnesota. (For more information see www.soybeans.umn.edu/crop/insects/aphid/aphid_sampling.htm.). The speed scouting technique is a binary system in which a plant receives a score of either a '+'(more than 40 aphids/plant) or a '-' (fewer than 40 aphids/plant). Using this system, there is never any need to count more than 40 aphids/plant. After accessing a number of plants (either + or -), a decision is made based on a sequential plant sampling. Under heavy aphid populations, this technique results in significantly fewer aphids being counted as compared with the 250 aphids/plant threshold.

Materials and Methods

In 2005 we established plots at the Iowa State University Johnson Research Farm in Story County to determine the effect of planting date and scouting technique on soybean aphid populations. Seven treatments were applied in two planting dates; four were planted early (untreated, no aphid, 250 aphids/plant, and speed scouting), and three were planted late (untreated control, no aphid, 250 aphids/plant). The seven treatments were replicated six times in a randomized complete block design. Plots measured 100 ft in length and 15 ft in width. Soybean aphids were counted weekly beginning the week of May 30 until plant senescence, and cumulative aphid days were then calculated and analyzed. Cumulative aphid days are used to estimate total plant exposure to aphids. At harvest, yields were recorded and corrected to 13% moisture (Figure 1).

Results and Discussion

We observed a significant effect on soybean exposure to soybean aphids (i.e., cumulative aphid days, Table 1) across our seven treatments. We applied insecticide twice to the no-aphid treatment, and we reached the 250 aphids/plant threshold at the same time the speed scouting required treatment in Story County, resulting in equal exposure to soybean aphids (Figure 1). We did not observe differences in yield when aphids were treated based on a preventative (no aphid), 250 aphids/plant, or speed scouting strategy (Figure 1).

The 2005 season is the first year that we have tested the speed scouting technique under field conditions. Our results suggest that this method compares favorably with a scouting program based on estimating populations of the total number of aphids on a plant. Further research will need to be conducted to determine if speed scouting is too conservative an estimate of soybean aphid populations, and therefore might trigger potentially unnecessary insecticide treatments. We did not accumulate higher soybean aphid populations in late-planted soybeans; interestingly, when we treated aphids in these plots, we did not see any yield protection in any of the late-planted fields across the three treatments. This is the second year that we have observed a lack of yield protection based on a preventative approach to soybean aphid management (the 0 aphid treatment). As with our results from 2004 (O'Neal and Johnson), our data in 2005 reaffirm the current recommendation of treating soybean

aphids when populations reach 250/plant and are increasing.

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Table 1. Treatment effect from the type III ANOVA tables from Story County.

	df	F value	P value
Cumulative aphid days	6, 30	52.66	<0.0001
Yield	6, 30	31.61	<0.0001

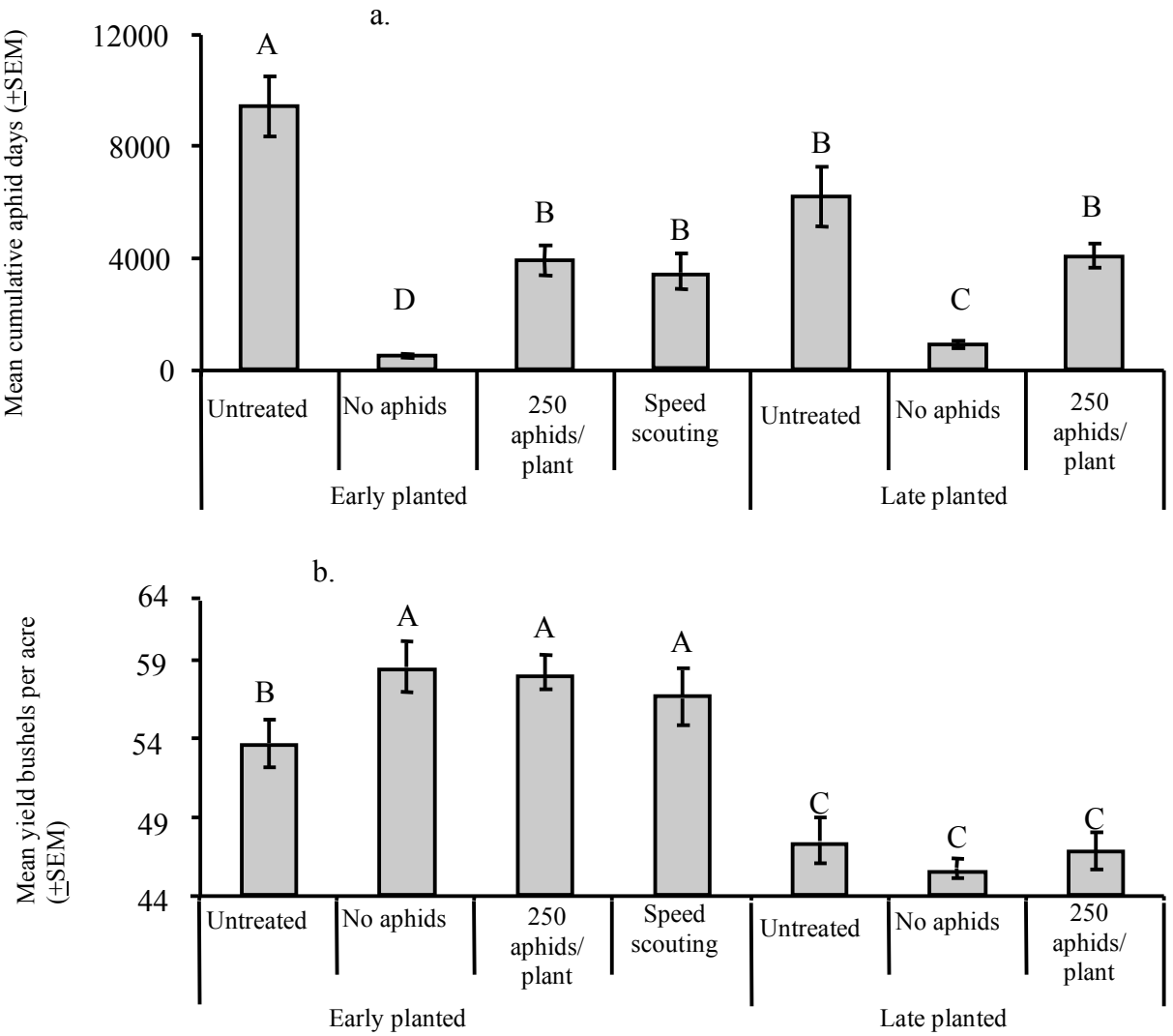

Figure 1. Story County research farm. a.) Impact of different scouting techniques and planting dates on plant exposure to aphids. b.) Impact of different scouting techniques and planting dates on yield.
Means labeled with a unique letter were significantly different (P=0.05). Early-planted treatments were planted May 23 and late-planted treatments were planted June 16. No aphid treatments were treated on July 7 and August 20. 250 aphids/plant and speed scouting treatments were treated August 20.