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Soybean Aphid Aphis glycines Populations in Central Iowa, 2004

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Abstract
We are developing an economic threshold for application of a foliar insecticide for soybean aphid management. We employed an experimental design that has been replicated across five states in an attempt to refine the current action threshold of 250 aphids/plant. This experimental design was expanded to address how adjusting planting date, a practice recommended for bean leaf beetle *Certoma trifurcata* management, may also affect soybean aphids.

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Introduction

We are developing an economic threshold for application of a foliar insecticide for soybean aphid management. We employed an experimental design that has been replicated across five states in an attempt to refine the current action threshold of 250 aphids/plant. This experimental design was expanded to address how adjusting planting date, a practice recommended for bean leaf beetle *Certoma trifurcata* management, may also affect soybean aphids.

Materials and Methods

The experimental layout was a completely randomized block design with four replications of six treatments in two planting dates. Plots measured 65 ft long by 20 ft wide. Soybeans (Novartis 524-K4 RR) were planted in 30 in. rows at 196,000 seeds/acre. The first planting was made on May 11 and the second planting on June 2.

The six treatments included: 1) untreated control; 2) an aphid free treatment; (3) insecticide applications when aphid populations reached 2,000 cumulative aphid days (CAD); 4) 4,000 CAD; 5) 8,000 CAD; and 6) 16,000 CAD. However, due to low aphid populations we decided to vary the treatments based on existing field populations. This required the number of replications to vary by treatment. Within the early planted soybeans, we included the following treatments: 1) an untreated control; 2) an aphid-free plot that was treated 3 times on July 1, July 30, and August 6; 3) an insecticide applied on July 30; and 4) an insecticide applied on August 6.

In the late-planted soybeans, we established only two treatments: 1) an untreated control and 2) an aphid-free treatment that was treated 3 times on July 1, July 30, and August 6.

The average number of aphids/plant was calculated each week by counting all the aphids on 10 randomly selected plants from each plot. This average was added to the previous week's average and divided by the number of days between samples to calculate aphid days.

We applied Warrior (lambda-cyhalothrin) insecticide at 3.2 oz/acre using 20 gallons of water/acre as carrier. Nozzles used were TeeJet 11002 twin jet on 15 in. spacing at 40 PSI. Plots were harvested mechanically with a combine on October 5 for both planting dates.

Results and Discussions

The number of aphid days accumulated between the treatments was significantly different, but there was no significant difference in the number of aphid days between planting dates (Figure 1). There were no yield differences between treated and untreated plots in 2004 (Figure 2) in either planting date. This suggests that populations below the initial 250 aphids/plant threshold may not reduce yields.

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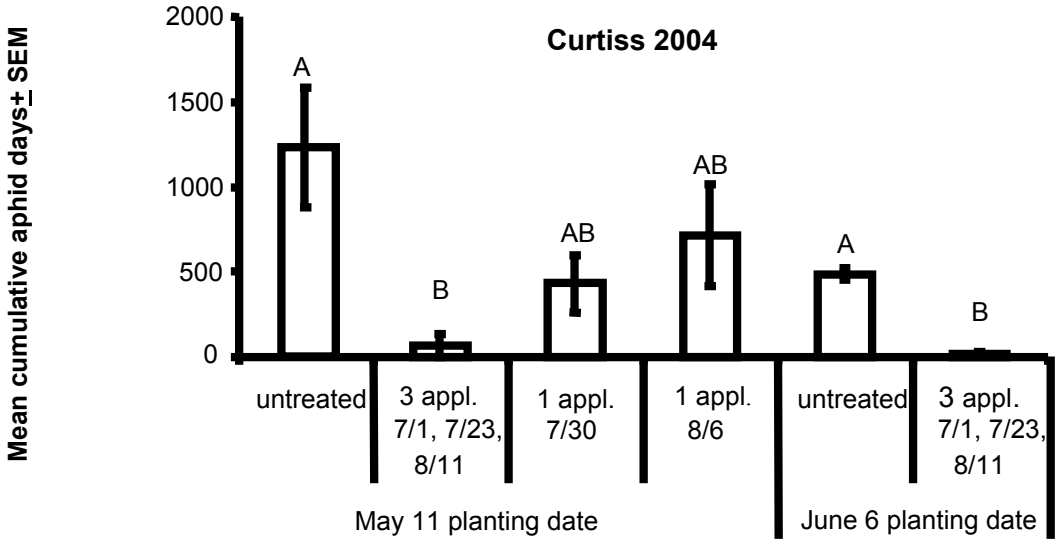

Figure 1. The effect of planting date and insecticide on soybean aphid populations. Means labeled with a unique letter were significantly different (P=0.05).

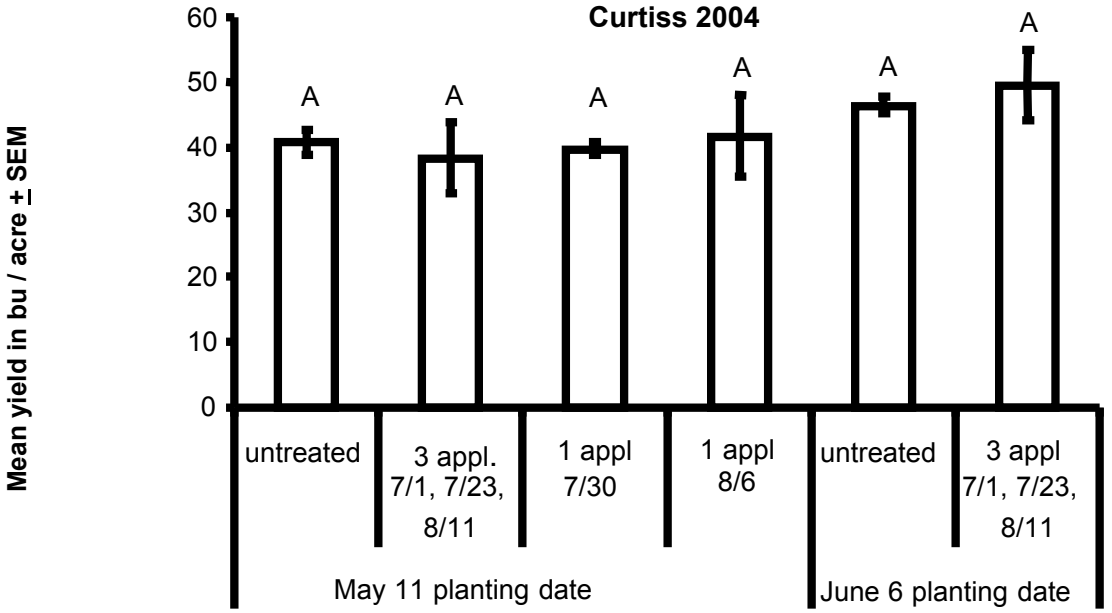

Figure 2. The effect of planting date and insecticide on soybean yield (13% moisture). Means labeled with a unique letter were significantly different (P=0.05).