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Soybean aphids attack: Does it pay to spray low populations?

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Abstract

After a relatively quiet June and July, soybean aphid populations are building in certain parts of the state. Although data may not be present, soybean aphids are likely to be present across the state. Aphid populations greater than 250 have been reported in Iowa. However, populations are spotty with heavily infested fields near those with much lower populations. Brian Lang, Iowa State University Extension (ISUE) field crop specialist in Winneshiek County, reports fields with several thousand aphids per plant, with neighboring fields below threshold.

Keywords

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INTEGRATED CROP MANAGEMENT

Soybean aphids attack: Does it pay to spray low populations?

After a relatively quiet June and July, soybean aphid populations are building in certain parts of the state. Although data may not be present, soybean aphids are likely to be present across the state. Aphid populations greater than 250 have been reported in Iowa. However, populations are spotty with heavily infested fields near those with much lower populations. Brian Lang, Iowa State University Extension (ISUE) field crop specialist in Winneshiek County, reports fields with several thousand aphids per plant, with neighboring fields below threshold. Factors that can put soybeans at risk for soybean aphid outbreaks include:

- Late planting
- K-deficiency
- Drought

Winged aphids are becoming more common, suggesting that fields planted later may be at risk.

If soybeans were planted later than the surrounding fields, these dispersing soybean aphids could colonize these younger plants, putting them at risk for an aphid outbreak.

Evidence from Chris DiFonzo, field crop entomologist at Michigan State University, indicates that soybean plants suffering from a K-deficiency are more at risk for soybean aphid outbreaks. The amino acids aphids require for growth differs between K-deficient and sufficient plants, with more essential amino acids found in K-deficient plants. Although the soybean plant that is K-deficient may appear yellow and stunted, it is a more nutritious food source than a healthy plant.

In addition, drought stress can improve soybeans as a food source for soybean aphids. Coupled with the additional stress of the aphid feeding, soybeans suffering from drought may need extra attention. However, be aware that drought conditions also favor spider mites. Pyrethroids tend to exacerbate spider mite populations, so growers may want to consider an organophosphate. In fields that have a high spider mite population, growers may need to reapply an insecticide if eggs hatch, producing a second spider mite outbreak.

Since populations are spotty, many growers are wondering if they should treat fields that have low soybean aphid populations. Some have suggested that populations as low as 10 aphids per plant require an insecticide treatment. During 2004, my lab conducted several experiments where natural infestations of soybean aphids were allowed to occur. Our research plots with the highest soybean aphid populations were in Story County, with a peak population of 82 aphids/plant (Figure 1). These populations occurred on soybeans that were planted on May 11, 2004. Although we did not reach our goal of treating at the 250

aphid/plant threshold, we did apply insecticide to determine if treating these low populations would impact yield. Not only did we apply insecticide, in this case Warrior, but for one set of plots we applied it three times (July 1, July 23, and August 11). This was our "zero-aphid" treatment, as we were attempting to keep the soybeans free of aphids.

As expected, the insecticide killed aphids. This is not meant as an endorsement of any product since I have observed similar results with organophosphates as well as other pyrethroids. What is interesting is that when these plots were taken to yield, we did not see a statistically significant difference in yields (Figure 2). Note that in Figure 2 we included data from a similar experiment, in which the soybeans were planted later on June 6, 2004. Soybean aphid populations on these late planted soybeans were not higher than those on plots planted on May 11. This entire experiment also was conducted in Floyd County, Iowa, with even lower aphid populations. Again, we did not observe a significant difference in yield at the Floyd County site.

Since we did not see an impact on yield from soybean aphid populations that were well below 250 aphids/plant, we are not recommending that growers treat these low populations. This does not mean that low populations now will not continue to increase. There is still plenty of time for populations to increase and growers should continue to scout their fields. However, it is possible that fields may not reach 250 aphids/plant or higher this year. Reports from Jim Fawcett, ISUE field crop specialist in southeast Iowa, show some fields with less than 10 aphids per plant.

In conclusion, pay particular attention to at-risk soybean fields (K-deficient, drought, late-planted), watch for spider mites in drought-stressed fields, and look at the label for preharvest intervals.

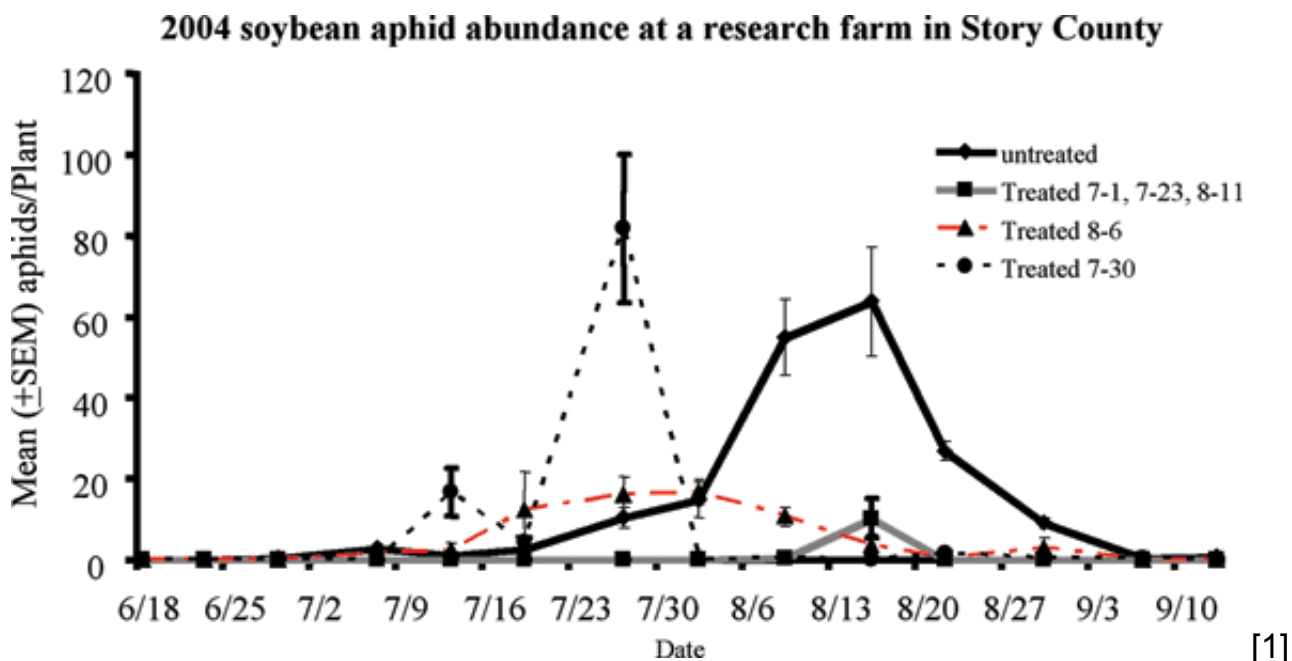


Figure 1. 2004 soybean aphid abundance at a research farm in Story County. Average number of soybean aphids per plant from field plots left untreated (solid line) or treated with Warrior (lambda-cyhalothrin) at 3.2 oz/acre, using 20 gallons of water/acre as carrier. Nozzles used were TeeJet 11002 twin jet on 15-in. spacing at 40 psi. Treatments were replicated 4 times, and the soybeans were planted in plots that measured 65 ft long 3 20 ft wide. Soybeans (Novartis 524-K4 RR) were planted in 30-in. rows at 196,000 seeds/acre. [1]

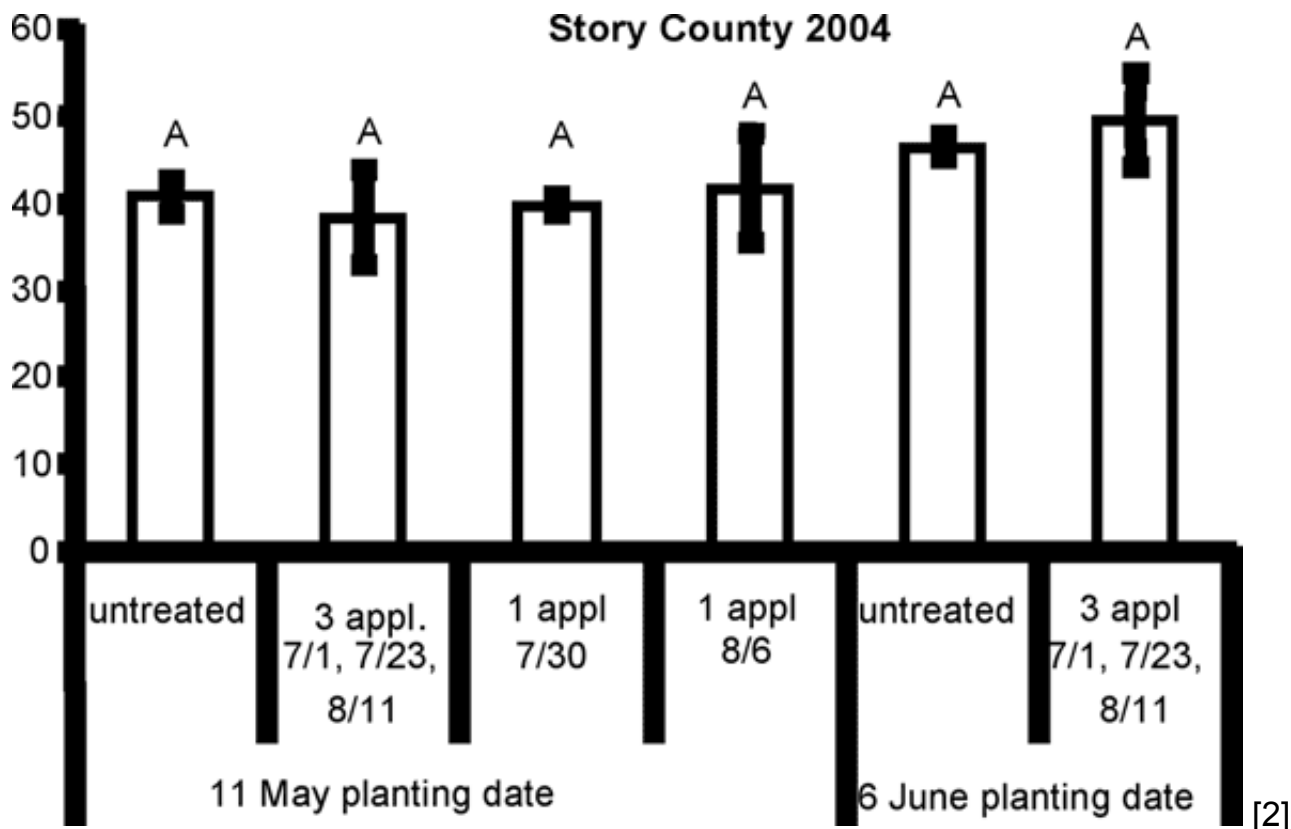


Figure 2. Story County 2004. The effect of planting date and insecticide on soybean yield (13% moisture). Means labeled with a unique letter were significantly different ($P = 0.05$).

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