RESULTS FROM ON-FARM SOYBEAN APHID TRIALS

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The soybean aphid continues to cause concern for producers. These trials were undertaken with the assistance of local producers in hopes to provide additional data on the control options for the soybean aphid. Studies conducted in Dodge County were conducted with field scale equipment while studies in Dane County were sprayed with a backpack sprayer but harvested with the producers combine. Yield monitors were used to determine grain yields at each location. While each location started out with the same project protocol, aphid response led to different spray times and responses, thus each location will be discussed separately.

Dodge County

Soybeans were planted May 22 next to a field planted almost 2 weeks earlier. Soybeans were scouted weekly starting in mid-July and 10 plants were sampled for whole plant aphid counts. Plots were sprayed with Warrior insecticide at 2.9 oz/acre on July 19, August 2, or August 9. One treatment was multiple applications and was sprayed each time. Soybeans were in the R2, R4, and R5 growth stages at the time of application.

Soybean aphid counts on the check plot increased rapidly at the end of July. The rating system used was as follows:

1	0 to 50 aphids per plant
2	51 to 100 aphids per plant
3	101 to 200 aphids per plant
4	201 to 500 aphids per plant
5	501 to 1000 aphids per plant
6	1001+ aphids per plant

Soybean aphid ratings during the growing season were as follows:

Rating date	Check plot rating
July 18	1
July 25	1.1
August 2	5.4
August 10	5.8
August 16	5
August 23	3.9
August 30	2.2
September 5	1

[1] Dane County UW- Extension Crops and Soils Agent and Dodge County UW-Extension Crops and Soils Agent, respectively.

Soybean yields were measured at harvest and showed a response to treatment. Soybeans treated at the R4 stage had the greatest yield at 63.7 bu/acre. The R2 and multiple treatments resulted in slightly lower yields at 62.9 and 61.9 bu/acre, respectively; however. these did not differ statistically from the R4 treatment timing. Soybeans treated at R5 growth stage and the untreated check yielded 59.1 and 58.7 bu/acre, respectively. These yields were statistically lower than the soybean yield from the R4 treatment timing. These data continue to suggest that we see a response to aphid treatment and that an optimum timing exists – in this case about the R4 soybean stage. Again the multiple treatment does not appear to be profitable, however, aphids did not have a resurgence in any treatments after the plots were sprayed.

An interesting note regarding the plot was the infestation of Aphids at the margin of the plot where it abutted the older soybean planting. This field margin was consistently over 1000 aphids per plant in both fields for a longer time than deeper into either field. A question remains regarding the attraction of that older/younger soybeans field edge to the aphid or perhaps it was just a coincidence.

Dane County

Soybeans were planted in early May at the Dane County location. Unlike the Dodge County location soybean aphid numbers never exploded. In fact, at the highest level, individual plant numbers failed to exceed 200 aphids per plant. Because of the low aphid numbers and lack of resurgence after application, only an R2 and R4 application were made. At the R2 application on July 23, aphids were just beginning to appear and had a resulting count of less than five aphids per plant. Aphid numbers increased slightly and at the R4 application on August 5 aphid counts were just over 60 aphids per plant on average. Both treatments were with Warrior insecticide at 3.2 oz/acre. Aphid populations had crashed by the next visit to the site and were not counted again.

Given these low aphid numbers it came as a great surprise when yields indicated a response. Soybeans treated at the R2 stage had the greatest yield at 77 bu/acre while untreated soybeans resulted in a yield of 69 bu/acre. Soybeans treated at the R4 stage yielded 74 bu/acre and did not differ from either the untreated check or soybeans treated at the R2 stage.

So the question remains, why did the low number of aphids in Dane County result in such a dramatic decrease in soybean yield. As you may be aware, 2002 was a very dry summer for localized areas of the state. One of these locations was the Dane County site. According to the cooperating producer, no measurable rainfall occurred from the middle of June until August 3. Because of this, the soybean plants may have been even more susceptible to plant moisture loss through aphid feeding than under more normal conditions. This does not lead to a recommendation to spray aphids at very low infestations but rather poses a question that must be further explored in

research trials and on-farm studies. If a soybean field is under stress due to lack of moisture, do soybean aphid thresholds need to be re-evaluated and maybe lowered for dry conditions.

Conclusions

Soybean aphid management continues to create questions for researchers and producers alike. Under the hot dry conditions of 2002, aphids failed to colonize the upper portion of the soybean canopy prior to moving into the lower half of the plant. In addition, at both locations in 2002 predator numbers remained low, why? In Dane County, low aphid numbers would be the easiest explanation for low predator numbers but what about Dodge County, where over 1000 aphids were seen per plant. In addition, in Dodge County, aphids were seen until leaves started to turn. As we saw this year, 200 aphids per plant did indeed justify treatment. However, under the dry conditions a much lower number also justified application. Currently, recommendations will stay at 200 aphids per plant; however, producers and consultants will have to consider their agronomic knowledge and local conditions to decide if lower numbers warrant treatment.