

## Treatment timing: “You could see the difference”

“The beginning reproductive stages definitely seem to be the optimum time to treat,” says Juan Edwards, soybean grower and certified crop advisor in Jefferson County, Wisconsin. “In 2003 we had trials on our fields. You could see the differences in plant height, podding and the number of beans in the pods. When we looked at beans that weren’t sprayed, we saw only one pod per node. These fields were planted at the same time.”

Edwards also experienced yield differences from treating the fields on different dates. “We wasted our money treating too early – on July 20. But on the field we treated July 25, we saw a seven- to 10-bushel difference. By the third treatment – after August 5 – the damage had been done. You can’t back up. There’s no regrowth.”

### Other NCSRP-funded research

In addition to all the research detailed in this *Research Update*, scientists are studying why aphids appear to be attracted to:

- Later-planted soybeans
- Potassium-deficient soybeans
- Drought-stressed soybeans
- Some soybean varieties more than others

NCSRP scientists also are looking at additional management and insecticide spraying techniques, such as:

- Experimental seed treatments
- Skip-row planting on narrow row soybeans
- Spray timing to protect honey bees

### R4 and above?

Chris DiFonzo, field crop entomologist at Michigan State University, agrees with Dr. Ragsdale. “We just don’t have a good handle on when to treat if the population begins to build after R3,” she says. “In my Michigan plots, the aphids came in later and our numbers were quite high, but we didn’t see the plant stress – and we didn’t see yield differences either.

“I’m confident in the 250 threshold, but once we get past R3, you might make your money back from spraying, you might not,” DiFonzo adds. But with \$7 beans and an average treatment cost of \$12, it only takes a two-bushel increase to recover the cost of treatment.

After R4, Ragsdale suggests that the damage potential is probably five to six bushels at most. But there are caveats. “That’s if there’s no water stress, if the plant has a full canopy, and if it has no other nutritional deficiencies.”

### Other factors affecting aphids

In deciding whether to treat, growers also need to consider factors such as water stress, weather, temperature, crop condition, other disease pressures and levels of biological predators in the field.

For example, drought stress seems to encourage aphid numbers. A lot of rain, on the other hand, will wash aphids off the plant. They prefer it dry and cool. And they can’t handle temperatures above 95°F, which is probably why you don’t find soybean aphid further south.

In 2004, NCSRP researchers are expanding yield loss experiments to include water stress, biological predators, disease pressures and crop conditions. Eventually, they’d like to answer all the questions growers have about soybean aphids.

**It’s all in the timing** Three years of replicated on-farm plot data from Jim Fanta, the University of Wisconsin Crop & Soils Extension Agent in Dodge County, Wisconsin, show the best time to treat is in that late July through early August window.

Plant Date	Insecticide oz/A	Spray Dates	Best Treatment – Yield (bu/A)	Check Yield (bu/A)
5/15/01	Warrior® 3.5	6/28, 7/21, 8/3	8/3 – 55.6	49.3
5/22/02	Warrior® 2.6	7/19, 8/2, 8/9	8/2 – 63.7	58.7
5/27/03	Mustang Max™ 3.2	7/24, 7/31, 8/7	7/31 – 45.8	32.6

Courtesy of David Ragsdale, U. of Minn.



**The magic number: 1,000**  
“Preventing the aphid population from reaching 1,000 per plant between R1 and R5 is critical,” says Marlin Rice, Extension entomologist at Iowa State University. “At that point you start losing yield relative to the cost of your control measures.”

Courtesy of Craig Grau, U. of Wis.



**This isn’t like spraying herbicides** “If you find aphids, treat them at the optimal time – and optimize how you treat,” says Chris DiFonzo, field crop entomologist at Michigan State University. “You need to make sure you make a good spray application, get good coverage and time it correctly.”