

Evaluation of Trap Crops to Reduce Organophosphate Sprays Against Sucking Bugs in Bollgard II Cotton Varieties

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The primary problems addressed with this project were to determine which trap crops would attract the most piercing/sucking bugs and time of growing season they moved into the respective trap crops.

Methods: Three trap crops were evaluated in replicated field trials for their respective effectiveness for piercing/sucking insect pests that attack cotton. Trap crops utilized were soybean (early maturity Group IV), peanut, and sorghum. Two fields were established at the Edisto REC; field 1 planted May 5 & 6 and field 2 was planted May 14 (only soybean and peanut). Cotton variety ST4646 BG2RR was planted in both fields the same day as the trap crops. Trap crops were planted (12 rows on both sides of cotton) in 75 ft. plots. Cotton plots were 75 ft. X 36 rows in field 1 and X 32 rows in field 2. The beat cloth sample method was used to sample insects. Sampling dates were: field 1—July 9, 16, 24, and Aug. 3; field 2—June 28, July 5, 15, 22, and Aug. 2. Piercing/sucking bug species sampled included tarnished plant bugs (*Lygus*) and the three major stink bug species (green, southern green, brown).

In addition to the above replicated field trials, 4 grower locations were established with a trap crop of soybean (early maturity Group IV) planted on either one or both sides of a cotton field (Fibermax 960BG2RR). Either 16 or 24 rows of soybean were planted depending upon field location. Two fields were abandoned due to poor stands caused by dry weather.

Results Summary: Data collected from replicated field trials at Edisto REC indicated that none of the three trap crops were effective in attracting *Lygus* bugs. In field 1, *Lygus* numbers were highest in cotton plots on July 9 when 10-12/4 meters of row were found. *Lygus* numbers were consistent in cotton adjacent to all three trap crops which indicates that no trap crop was better than another. *Lygus* numbers remained at 10/4 meters on July 16, declined to <7/4 meters on July 24 and were essentially non-existent on Aug. 3. Sorghum was the only trap to attract any *Lygus* (a high of 5/4 meters on Aug. 3); soybean and peanut did not attract *Lygus*. Field 2 had only peanut and soybean; results were the same as field 1, *Lygus* were not attracted to these two crops. These data suggest that cotton is a preferred host vs. soybean, peanut, and sorghum.

Stink bug numbers were low in all locations in 2004, therefore all 3 species were combined for data analysis. All 3 trap crops used did serve as a reservoir for stink bugs with soybean being the most attractive. In field 1, comparing trap crops, stink bug populations were highest in soybean on all sample dates (14/4 meters on July 9, 20/4 meters on July 24, and 12/4 meters on Aug. 3). Stink bug numbers in peanut and sorghum never exceeded 2/4 meters during the sampling period. The increased number in soybean did not carry over to adjacent cotton. In field 2, soybean was again the preferred trap crop compared to peanut. Numbers were highest on the last sample date of Aug. 2 when 12/4 meters were found in soybean.

In the grower field scenarios, stink bug populations were not significant. The soybean trap crop was sampled in a timely fashion but stink bugs never established at either location.

Impact Summary: Data collected in the replicated studies at Edisto REC show that early maturity soybean varieties will attract and hold stink bug species. Additional studies at Edisto in 2002-2004 indicate that Group IV soybean will attract stink bugs. The plot size used in the 2004 tests was too small; this was very obvious in the 2 grower fields used. S

The discovery of soybean rust in 2004 would certainly be a factor in using soybean as a trap crop; the trap crop would also serve as a reservoir for rust.

Piercing/sucking bugs (both Lygus and stink bug species) prefer to feed on plants that have developing fruiting structures. This offers an explanation as to why early maturing soybean was the most attractive trap crop in these studies. We have seen substantial populations of stink bugs move into cotton without establishing themselves in an adjacent trap crop of soybean or peas. An objective of this research was to determine if we could attract piercing/sucking pests into a trap crop, treat the trap crop to eliminate potential pressure in adjacent cotton, therefore reducing the need to treat the cotton for these pest species. The studies conducted in 2004 indicate that at this time, trap crops do not appear to be a feasible alternative in controlling these pest species.