

USE OF A MUSTARD TRAP CROP TO STUDY EFFICACY OF *BEAUVERIA BASSIANA* TREATMENTS TO CORN AND SOYBEAN FOR CONTROL OF TARNISHED PLANT BUG IN COTTON**R. G. Luttrell****Owen Houston****Maribel Portilla****Gordon Snodgrass****Ryan Jackson****USDA ARS Southern Insect Management Research Unit
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A preliminary field study was conducted in 2012 to measure impact of spraying tassel-stage corn and blooming early-maturity-group soybean with *Beauveria bassiana* on tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois) populations before they colonize cotton. Four-row strips of mustard (total of 2.9 acres) were planted across a small-plot field study (total of 8.7 acres) to build tarnished plant bug populations early in June. Peak densities of tarnished plant bugs were above 35,000/acre when the mustard crop was mowed on June 15. Between the strips of mustard, eight-row strips of cotton (total of 2.9 acres) were planted between four-row strips of corn (total of 1.45 acres) and soybean (1.45 acres) that were at tassel and flower stages, respectively, when the mustard was mowed. Subsequent densities of tarnished plant bug peaked at 29,288/acre in soybean and 2302/acre in corn. Strips of corn, soybean and cotton were divided into experimental plots 120 feet long and replicated four times in 2X5 factorial (two border crops and five insecticide treatments) across the study area. Treatments applied with a high-clearance sprayer at 12 gpa total volume included the NI8 strain of *B. bassiana* (10^9 spores per acre), novaluron plus the NI8 strain of *B. bassiana* (0.06 lb ai per acre plus 10^9 spores/acre), novaluron alone (0.06 lb ai per acre) and acephate (1.0 lb ai per acre). An unsprayed control was also included in the experiment. Treatments were applied to the corn and soybean border crops on June 18 and June 28. Treatments were applied to the border crops and cotton plots on July 5 and July 24. Observations included bioassays of leaves for residual activity of *B. bassiana* against tarnished plant bugs, routine sampling of tarnished plant bug nymphs and adults in all three crops, routine within-season plant maps of cotton fruit retention and fruit damage, mechanical harvest of the center two rows in cotton plots, and end-of-season box mapping of plants from each cotton plot to determine yield and fruit survival by main-stem and branch node location. Infection of tarnished plant bugs held on cotton leaves from the *B. bassiana* and novaluron plus *B. bassiana* was evident but less than 10%. This residual infectivity was low compared to infection measured on leaves from an adjacent large-plot study of cotton sprayed with *B. bassiana* at a rate of 10^{12} spores per acre (more than 25% infection). Analyses of tarnished plant bug densities and within-season fruit retention indicated infestation (peak densities of 5232/acre in some plots) and damage (61 to 86% retention of 1st position fruit) in cotton, but distinctive differences among treatments were not evident. Yield and end-of-season box maps were generally correlated with the small differences observed among treatments. Yield of cotton bordering soybean was slightly higher than that of cotton bordering corn, suggesting that soybean may have served as a trap crop. Trends in overall colonization of cotton by tarnished plant bugs across the area suggest that larger plots are needed to measure impacts on tarnished plant bug populations.