

EVALUATION OF NECTARILESS COTTON BREEDING LINES FOR RESISTANCE TO TARNISHED PLANT BUGS**Ted P. Wallace****Mississippi State University****Mississippi State, MS****Jeff Gore****Delta Research and Extension Center****Stoneville, MS****Abstract**

The tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), is currently considered the number one pest of cotton, *Gossypium hirsutum* L., in the USA. Development of insecticide resistance has greatly challenged efforts to control this pest. Host plant resistance has the potential to reduce reliance solely on chemical control. Previous studies have shown the potential value of the nectariless trait in reducing tarnished plant bug (TPB) populations. In 2008, a field study was conducted to determine the level of host plant resistance in several recently developed nectariless cotton breeding lines. Eight entries comprised of six nectariless breeding lines and two nectaried commercial varieties (FM 966 and DP 393) were arranged in a split-block design with four replications. Each eight row block was split into two strips with each strip receiving a treatment (sub-plot) of either 1) TPB controlled (insecticide application for TPB at recommended threshold) or 2) TPB uncontrolled (no insecticide application for TPB). Whole plots (entries) consisted of 8 rows 40 feet in length with a row spacing 40 inches. The trial was planted on May 22, and the center two rows of each 4 row sub-plot harvested on October 16.

Not surprisingly, average lint yield across all entries was significantly reduced when TPB were not controlled. A significant average yield loss of approximately 28% (245 lbs/a) was attributed to TPB damage (TPB uncontrolled). Two components of yield, lint percentage and boll weight, were also significantly reduced. However, reduction in lint percentage and boll weight attributed to TPB damage was small. No differences in fiber quality traits were attributed to TPB control.

Analysis of variance revealed a significant entry by treatment interaction for lint yield indicating that not all entries responded similarly to TPB. When TPB populations were controlled, FM 966 and breeding line 0141-14 ne produced yields significantly greater than all other entries. Although FM 966 produced a slightly higher yield than 0141-14 ne, FM 966 suffered a 48% yield loss compared to a 17% yield loss for 0141-14 ne when TPB were not controlled. Nectariless line 0141-14 ne has good yield potential, as indicated by performance when TPB were controlled, as well as tolerance (or another mechanism such as non-preference) to TPB as indicated by high yield in the absence of TPB control. Breeding line 0141-15 ne, a sister line to 0141-14 ne, also performed well regardless of TPB control. All but one nectariless breeding line produced higher lint yields compared to the nectaried commercial checks when TPB were not controlled. Nectariless breeding line 0149-17 ne suffered a 32% yield loss when TPB were not controlled suggesting that the nectariless trait does not confer the same degree of tolerance in all genotypes or genetic backgrounds. Two or more nectariless breeding lines will be proposed for release as germplasm.