



DURATION OF FEEDING BY TARNISHED PLANT BUG ON SMALL BOLLS AND IMPACT ON YIELD AND FIBER QUALITY

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RESEARCH PROBLEM

The tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), can be a very damaging pest to cotton during squaring, with their feeding causing square shed. Plant bugs also feed on small bolls causing a loss of fiber quality, boll shed, and yield loss. While it is known that the plant bug damages bolls, less is known about the length of time that a plant bug must feed upon a boll before damage is done (Kharboutli, 2001).

BACKGROUND INFORMATION

The tarnished plant bug (TPB) continues to cause damage to cotton in Arkansas, and two recent developments may cause the plant bug to become more damaging to cotton grown in Arkansas. First of all, the Boll Weevil Eradication Program (BWEP) is eliminating the boll weevil and the number of insecticide applications for its control that incidentally help suppress numbers of plant bugs. Multiple aerial applications of Ultra-Low-Volume (ULV) malathion provide significant population reductions of tarnished plant bugs (Allen and Kharboutli, 2000). Secondly, the widespread usage of transgenic *Bt* cotton has also reduced the number of chemicals applied that have some level of control of TPB. Early season damage to cotton caused by the plant bug has been thoroughly discussed in the literature (Hanny et al., 1977; Smith, 1986; Johnson et al., 1996). This research demonstrated that plant bug-associated square loss was reported to delay fruiting and crop maturity. Little is known about the relationship between boll damage caused by the plant bug and length of time required during feeding to cause significant boll damage and yield loss.

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RESEARCH DESCRIPTION

The study was conducted on the Southeast Research and Extension Center on the University of Arkansas at Monticello (UAM) campus to avoid ULV malathion sprays applied for boll weevils by BWEP. Twenty rows of NuCotn 33B planted on 14 May 2001 were 40 feet in length with a row spacing of five feet. Plants were irrigated using drip irrigation. Tarnished plant bugs were obtained from USDA near Greenville, MS, placed inside paper containers containing green beans and held overnight in an environmental chamber at 27°C, 60%RH and a 14 h photoperiod. Adult plant bugs were placed into 2-ml vials (2 plant bugs per vial), and each vial was placed into a 20 x 18 cm net drawstring cage. The cages were taken to the field and placed on small first-position bolls that had been prepared by removing the petals. The vials were opened to release the plant bugs, which were left to feed on bolls for 12, 24, 36, and 48 hours. Controls (0 hours) were included in the experiments and consisted of caged bolls without plant bugs. Following each treatment duration, plant bugs were destroyed, and cages were removed. Trials were conducted on 11, 16, 24, and 26 July and on 1 August 2001, with an equal number of cages for all five feeding regimes. Cotton was protected with insecticides (Capture 2 at 0.1 lb ai/acre and Fury 1.5 at 0.045 lb ai/acre on 9, 10, and 22 August 2001) after the last experiment terminated on the last test date and harvested on 25 September 2001.

RESULTS AND DISCUSSION

There were no significant differences in seedcotton weights as indicated by boll weight (Table 1) or High Volume Instrument fiber quality variables (Table 2) analyzed. Except for the 48-hr regime, there was a trend toward reduced yield with increasing exposure to tarnished plant bug. Overall, feeding exposure from 12 hours to 48 hours had little impact on yield and lint quality. These results were consistent with those obtained in 2000 (Kharboutli, 2001).

FUTURE RESEARCH

A number of modifications will be implemented for this study in 2002. The number of replications will be increased by increasing acreage, the cage design will be modified, and bolls caged will be older than those used in 2000 and 2001.

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Table 1. Effect of duration of plant bug feeding on boll weight.

Feeding regime (hours)	Boll weight ^z (g/boll)
0	4.6
12	4.2
24	4.1
36	3.8
48	4.5

^z No significant differences (P >0.05).

Table 2. Effect of duration of plant bug feeding on fiber quality^z.

Feeding regime (hours)	Micronaire	Length (in.)	Uniformity (%)	Strength (g/tex)	Reflectance	Yellowness
0	4.6	1.1	82.2	27.7	69.4	7.7
12	4.3	1.1	82.3	28.1	70.0	8.9
24	4.9	1.1	82.2	26.5	68.5	8.4
36	4.9	1.1	82.2	27.3	71.6	8.3
48	4.3	1.1	82.5	28.6	69.5	9.7

^z No significant differences (P >0.05).