TREATMENT THRESHOLDS FOR STINK BUGS, 2003

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RESEARCH PROBLEM

Predominant phytophagous (plant-feeding) stink bugs in the southeast and much of the mid-South are similar and include the green stink bug, Acrosternum hilare (Say), the southern green stink-bug, Nezara viridula (L.), and the brown stink bug, Euschistus servus (Say). Several other species are part of the plant-feeding stink bug complex but are of less importance. Stink bugs will become more important and challenge current and future efforts concerning cotton insect management. Investigations into alternative monitoring strategies and management tactics for the pest complex are ongoing projects. In 2003, investigations were continued into development of boll-injury-based thresholds for stink bugs.

BACKGROUND INFORMATION

The status of stink bugs as a challenging pest group continues to escalate because of various factors related to reduced reliance on broad-spectrum foliar insecticides. Factors that allow stink bugs to thrive under our current and future production practices include the eradication of the boll weevil, Anthonomus grandis Boheman, availability of alternative chemistries for selective control of worm (Lepidoptera) pests, established use of transgenic Bt cotton, and the recent registration of second-generation Bt cultivars, enhanced for controlling worm pests. All of these advances offer significant reductions in broad-spectrum foliar insecticide usage, and stink bugs greatly benefit from the reduction of insecticides traditionally applied for major pest groups, i.e., “coincidental” control of stink bugs has been eliminated. Stink bugs are now recognized as part of an important group of boll-feeding insects, and producers have had to shift to using “intentional” control for their management. Entomologists have been addressing this problem for several years now and have generated some useful information concerning management of stink bugs in cotton (Greene et al., 1999; Greene et al., 2001a, b; Willrich et al., 2002, 2003; Greene and Capps, 2002, 2003).

RESEARCH DESCRIPTION

Plots of DP424BIIRR and SG215B/RR at the Rohwer Branch of the Southeast Research and Extension Center in Desha County, Arkansas (24 rows by 70 ft and 16 rows by 40 ft, respectively) and PM1218B/R at a producer’s farm in

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Ashley County, Arkansas (16 rows by 300 ft) were arranged in a randomized complete block design, with 6-7 treatments and four replications. Twenty-five bolls (50-75% full size, ca. 14 days after white bloom) were collected from each plot weekly and examined for internal symptoms of feeding by stink bugs. A boll was considered damaged if it had at least one internal growth abnormality (cell proliferation) or obvious staining of lint with associated feeding injury to seeds observed. Dicrotophos (Bidrin 8, Amvac, Los Angeles, Calif.) was applied at 0.50 lb [AI]/A to all plots in a treatment at or exceeding the following levels of damaged bolls: 10, 20, and 30% and at a density of 1 bug per 6 ft of row. Additional treatments included a 15% level in Ashley County and an untreated control at both locations. Two or four rows from the center of each plot were harvested by machine. Data were processed using Agricultural Research Manager (ARM) (Gylling Data Management, Inc., Brookings, S.D.), and means were separated using Least Significant Difference (LSD) procedures following significant F tests using Analysis of Variance (ANOVA).

RESULTS AND DISCUSSION

During 2003, three fields in southeast Arkansas were established for research addressing boll-injury thresholds for stink bugs. Data from two of the sites located at the Rohwer Experiment Station in Desha County, Arkansas, with identical treatments were pooled for analysis (Fig. 1). At those sites, 2.0-2.5 applications of dicrophos (Bidrin 8) at 0.5 lb (AI)/A at thresholds of 10 and 20% internal boll injury resulted in 260 and 212 lb/ac, respectively, of increases in lint yield when compared with untreated plots. In-field populations were not detected at the threshold of 1 bug per 6 row feet using a shake sheet. These data are similar to those summarized from earlier trials (Greene and Capps, 2003).

When yield increases and insecticide costs were calculated, the 10% level of treatment (followed closely by 20%) yielded the best net return. In these trials, significant populations of tarnished plant bug (TPB), *Lygus lineolaris*, were present for most of the fruiting period and, although treated 2-3 times with insecticide specifically for control of TPB, caused significant injury to small bolls. The benefits of treating earlier for stink bugs at the 10% level of injury undoubtedly resulted in reduced numbers of both TPB and stink bugs and increased returns. At a third location in Ashley County, Arkansas, results were similar as plots protected four times with Bidrin at the 10 and 15% level produced about 100 lb/ac more cotton than plots treated three times at the 20% level. Bolls and yields were significantly affected at 30 and 50% damage levels after 1 or 2 treatments with Bidrin. When populations of boll-feeding bugs were predominantly comprised of stink bugs, cotton with bolls protected at the 20% level of internal injury produced the highest yields and net return (Greene and Capps, 2003). Under conditions of high TPB pressure, coupled with numbers of stink bugs, protection in the 10-20% range of boll injury apparently provided supplemental protection from TPB and resulted in highest yields and net returns. Recommendations in most states include some variation of a boll-injury threshold for stink bugs and other boll-feeding bugs. As
a result of these continuing studies, alternative monitoring and management recommendations are available for stink bugs in cotton.

**PRACTICAL APPLICATION**

Research with treatment thresholds for stink bugs, based on monitoring internal feeding injury to bolls, supported treatment at the 10-20% rate of injury to mid-sized (ca. 14-d-old) bolls.

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**DISCLAIMER**

The mention of trade names in this report is for informational purposes only and does not imply an endorsement by the University of Arkansas Cooperative Extension Service.

**LITERATURE CITED**


**Fig. 1.** Two-site average lint yield in 2003 following treatment with dicrotophos (Bidrin 8, avg.# of treatments per treatment) at various thresholds (percentage of internal boll injury or density) for stink bugs. *Net $ gain, calculated with yield gain at $0.65 per lb minus $8.31 per application ($5.31, insecticide plus $3.00, application costs). Treatment bars with a letter in common are not significantly different, P>0.05, LSD = 146.95. Bt varieties, 2 sites, 2003.