

PRELIMINARY DATA FROM CAGE STUDIES ON INSECTICIDE EFFICACY ON THE TARNISHED PLANT BUG

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RESEARCH PROBLEM

Cage studies can provide valuable data pertaining to insecticide efficacy on arthropod pests. Standard field trials on insecticide efficacy are not without shortcomings, most notable of which is the free movement of arthropods in and out of the treated plots. Data obtained from cage studies can supplement those obtained from large scale plot trials.

BACKGROUND INFORMATION

The tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois), is a major concern of Arkansas and other mid-South cotton growers. In previous studies (Kharboutli *et al.*, 1999), we and other researchers had seen plant bug mortality after treatments with the insecticides Steward and Denim. In previous cage studies in Louisiana, plant bug mortality following Steward applications was not impressive (Leonard, personal communication). Also, Steward has been reported to be less effective on plant bugs in Arizona. We hypothesized that available water on the leaves might be responsible for some of the differences seen.

RESEARCH DESCRIPTION

This study was conducted in 1999 on the Southeast Branch Experiment Station near Rohwer. DPL NuCotn 33B was planted on 13 May 1999. Plots were 2 rows x 40 ft long and were arranged in a randomized complete-block design with four replications. However, only two replications were completed because sufficient numbers of tarnished plant bugs were not available. Standard production practices were used to manage plots. Insecticides were applied in the morning on 20 July and 27 July using a CO₂-charged backpack sprayer in 10 gal of total spray solution/acre. Tarnished plant bugs were then collected, primarily from plains coreopsis, by blowing them into a sweepnet bag using a leaf blower (KISS) sampler. The insects collected by this procedure were briefly refrigerated, then collected into 2-ml vials (two per vial) and held for 1-3 h, and damaged and dead plant bugs removed. Only adult bugs were used. Vials were then placed into 20 x 18 cm screen net drawstring cages (530 µm screen). Each

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cage received 2-4 vials. The cages were moved to the field in a cool ice chest. In each plot, 3-4 cages were placed on the tops of plants and secured by the drawstring. The vials were opened, releasing the plant bugs. In “wet” plots, the tops of plants were misted with water just before the cages were installed. The plant bugs in these plots were released onto wet leaves.

Twenty-four hours after the cages were installed, they were removed by cutting the caged portion of the plants and returning the tops of plants with cages attached to the laboratory for insect counts and mortality assessment. Paper grocery bags, labeled with the appropriate plot number were used to transfer the cages to the lab. In the laboratory, the cages were carefully removed and dead and live tarnished plant bug adults were counted. Since only two replications were completed, data were not analyzed statistically, but instead are shown as percentage of mortality for each replication.

RESULTS AND DISCUSSION

Mortality of tarnished plant bugs caged on untreated cotton (both wet and dry) was higher than was desirable or expected. Mortality was considerable as the insects were being held prior to placement into cages. The cause of this mortality is unknown. There was little difference across treatments irrespective of whether the insects were released onto wet or dry leaves (Table 1). However, for Steward, there appeared to be an increase in mortality when insects were released onto wet cotton leaves. Mortality was numerically highest in the Provado-treated plots, somewhat lower in the Denim-treated plots and lower still in the Steward-treated plots. Studies conducted by DuPont researchers indicate mortality from Steward occurs slowly over 2-3 days (Edmund, personal communication). This may explain the low 24-h mortality seen in this study.

PRACTICAL APPLICATION

Denim and Steward appear to have activity against the tarnished plant bug. Neither provided a high percentage of mortality 1 day after treatment, although Provado provided fairly high levels of mortality after 1 day. Percentage of mortality in the Steward-treated plots tended to increase when the bugs were released onto moistened leaves.

LITERATURE CITED

Kharboutli, M.S., C.T. Allen, C. Capps, and L. Earnest. 1999. Outlook for Steward insecticide in Southeast Arkansas. Proc. Beltwide Cotton Conf., National Cotton Council, Memphis, TN. pp. 1092-1095.

Table 1. Percent mortality of tarnished plant bug adults caged 24 hours on wet or dry cotton leaves previously treated with various insecticides. Rohwer, AR, 1999.

Treatment	Rate lb ai/acre	Plant Surface ^z	Rep 1 ^y		Rep 2 ^x		Summary Rep 1+2	
			Mortality %	Tested #	Mortality %	Tested #	Mortality %	Tested #
Check	—	dry	33	27	42	12	38	39
Check	—	wet	44	25	33	9	39	34
Denim	0.01	dry	62	24	66	12	64	36
Denim	0.01	wet	60	20	70	10	65	30
Provado	0.047	dry	83	24	92	12	88	36
Provado	0.047	wet	80	25	82	11	81	36
Steward	0.11	dry	39	23	25	12	32	35
Steward	0.11	wet	46	26	50	12	48	38

^z In wet plots, leaves were moistened with water prior to releasing the plant bug adults.

^y Replication 1 was initiated on 20 July 1999 and counted on 21 July.

^x Replication 2 was initiated on 27 July 1999 and counted on 28 July.