

Impact of Diamond Application Timing on Tarnished Plant Bug Management on Grower Farms

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Diamond is an insect growth regulator that only affects the immature stages of insect pests. Because of that, applications of Diamond are typically made well into the flowering period when large numbers of nymphs are present and after failures with other insecticides have occurred. Previous research has shown significant impacts on tarnished plant bug densities and cotton yields when Diamond was applied prior to flowering when large numbers of adults are migrating into fields. In those experiments, tarnished plant bug nymph densities where Diamond was applied prior to the occurrence of nymphs remained lower than in areas where Diamond was not applied for up to four weeks after the application. Additionally, yields ranged from 150 to 300 lbs lint per acre higher where Diamond was applied pre-flower. Adults migrating into cotton fields at this time have already been mated and begin laying eggs within a short amount of time (Stewart and Gaylor 1994). Therefore, it is believed that Diamond is having an impact on oviposition, egg viability, and is killing young nymphs shortly after they hatch when it is applied in this manner. Field demonstrations were conducted on grower farms in the Mississippi Delta to highlight the importance of Diamond application timing on tarnished plant bug management. These demonstrations were done in conjunction with three growers and their consultants on a total of five fields. Each field was split into two approximately equal halves and the application timing was based on each consultant's spray recommendation. The applications were made pre-flower when large numbers of adults were migrating into fields. All applications were made by air at 3 GPA except one that was made by ground at 10 GPA. In each of those cases, the consultants reported that they were able to increase their application intervals for tarnished plant bugs. In fields where Diamond was applied pre flower, application intervals ranged from 10 to 14 days. In contrast, application intervals ranged from 5-7 days in fields that did not have a pre-flower application of Diamond. Yields were obtained from three of the fields in these demonstrations. Yields averaged 1424 lbs lint per acre across those fields where Diamond was applied pre-flower and 1264 lbs lint per acre where Diamond was not applied (Table 1). Based on these results, Diamond should be used in an overall IPM program for tarnished plant bugs. Applications should be applied during the pre-flowering/early-flowering period when large numbers of adults first migrate into fields, but before large numbers of nymphs occur.

Table 1. Impact of pre-flower Diamond applications on cotton yields in Mississippi.

Field	Yield (lbs Lint/A)		Difference
	Diamond	No Diamond	
Washington Co.	1321	1148	173
Washington Co.	1424	1296	128
Sunflower Co.	1527	1348	179
Mean	1424	1264	160

Reference

Stewart, S. D., and M. J. Gaylor. 1994. Effects of age, sex, and reproductive status on flight by the tarnished plant bug (Heteroptera: Miridae). *Environ. Entomol.* 23: 80-84.