

COTTON RESPONSE TO TRIMAX™ INSECTICIDE

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Abstract

Previous studies, on cotton, have shown that some insecticides have plant growth regulator properties (Bauer and Cothren, 1990; V.R. Reddy et al., 1997). For example, chlordimeform, an ovicide, has physiological activity similar to zeatin, a naturally occurring cytokinin. Also, aldicarb, a systemic insecticide, when used in cotton production, enhanced growth rates and promoted deeper root growth. Trimax™, imidacloprid, is an insecticide introduced by Bayer Corporation. Multiple applications of Trimax™ have been reported to enhance early plant growth and possibly increase yield as a result. The objective of this study was to look at the physiological effects of Trimax™ insecticide on plant growth, yield and fiber quality of cotton. A field study was conducted at the Texas A&M Agricultural Experiment Station in Burleson County, Texas under irrigated conditions to investigate these objectives. The statistical design consisted of a split-plot design with seed treatments as the whole plot and foliar applications of Trimax™ as the sub-plots. Seed treatments included a control (*none*), Temik® (*aldicarb*), Cruiser™ (*thiamethoxam*), and Gaucho® (*imidacloprid*). Trimax™ applications were 0 applications (control), 1 application at 0.11 L/ha applied at the 5-leaf stage, 2 applications of 0.11 L/ha each [applied at 5-leaf stage and 10 days after initial treatment, (DAIT)], and 3 applications at 0.11 L/ha each (applied at 5-leaf stage, 10 DAIT and 20 DAIT). Observations were recorded for plant height, total number of nodes, SPAD readings (for chlorophyll content), mid-season plant-mapping which included leaf area and biomass partitioning, end of season box-mapping, and yield and fiber quality analysis. SPAD readings over the season showed high variability making it difficult to conclude if there were any differences in chlorophyll content among applications of Trimax™. Plant height increased during early growth due to seed treatments. Gaucho® and Cruiser™ also showed a trend for being significantly taller than the control. Yield was not significantly affected by seed treatments. All of the foliar applications of Trimax™ caused numerical increases in yield compared to the control. The box-mapping data supported this yield trend. The number of bolls per plant was not affected by treatment. Mean weight of boll, however, showed the same increase as reflected in lint yield. All applications of Trimax™ gave higher numerical mean boll weights than the control at boll positions one, two, and three. Three supplemental greenhouse studies were also conducted. Overall, the greenhouse research also indicated numerical increases in boll weight and/or boll number. However, due to the small sample size available in the greenhouse, additional field studies are necessary to ascertain the impact of foliar Trimax™ treatments on cotton.

References

Bauer, P.J. and Cothren, J.T. 1990. Growth-promoting activity of chlordimeform. *Agron. J.* 82:73-75.

Reddy, V.R., Wang, Z., Reddy, K.R. 1997. Growth responses of cotton to aldicarb and temperature. *Environ. Exp. Bot.* 38:39-48.