EFFECTIVENESS OF SELECTED TREATMENT THRESHOLDS AGAINST LEPIDOPTERAN PESTS IN *BT* COTTON John A. DuRant, Mitchell E. Roo, and Gloria S. McCutcheon Clemson University Pee Dee Research and Education Center Florence, SC

## Abstract

A field study was conducted to determine the effectiveness of applications of Karate (l-cyhalothrin) to NuCotn 33B based on egg and larval treatment thresholds for bollworms (Helicoverpa zea [Boddie]), and to assess the impact of prior applications of acephate on populations of predaceous arthropods and the subsequent impact on bollworm and fall armyworm (Spodoptera frugiperda [J. E. Smith]) populations and damage. Main plots (acephate, no acephate) were subdivided into 5 thresholds: (1) 1 application of Karate at peak oviposition, (2) 1 application of Karate at peak oviposition followed by a 2<sup>nd</sup> application ca. 1 wk later, (3) 1 application of Karate when 3 large larvae (0.25-in. in length)/100 plants are present, (4) 1 application of Karate when 3 large larvae/100 plants are present followed by a  $2^{nd}$  application ca. 1 wk later, and (5) no applications of Karate.

All treatment thresholds were reached for the plots which had been previously treated with 0.50 lb (AI)/acre of acephate on June 30 and July 8, 15, but only the egg thresholds were reached for the plots which had not been treated with acephate. Three applications of acephate to NuCotn 33B prior to initiation of oviposition by 2<sup>nd</sup>generation moths of the bollworm reduced population densities of beneficial arthropods, resulting in increased survival of bollworm and fall armyworm larvae and increased damage to bolls. Averaged over acephate and no acephate, both egg thresholds significantly reduced mean densities of large bollworm larvae compared with all remaining thresholds. The 2-application egg threshold significantly reduced mean damage to bolls and mean densities of fall armyworm larvae compared with the singleapplication egg threshold and all remaining thresholds. These results indicate that bollworm egg thresholds are superior to larval thresholds in Bt cotton, at least in situations where beneficial arthropods have been drastically reduced by prior applications of pesticides. Acephate produced nonsignificant decreases in yields, ranging from 8.7-21.8%, for each threshold. Of particular interest are the 14.3% and 10.7% decreases for the 2-application and 1application larval thresholds, which occurred even though only the acephate plots had been treated with Karate. Threshold had no significant effect on yields and no definite correlation between threshold and yield was apparent. Further research is needed to optimize treatment thresholds for lepidopterous pests in *Bt* cotton.

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