2003 BELTWIDE COTTON CONFERENCES, NASHVILLE, TN – JANUARY 6-10

COTTON TOLERANCE TO TANK-MIXTURE COMBINATIONS OF ENVOKE AND FOLIAR INSECTICIDES

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Abstract

Envoke is a new sulfonylurea herbicide being developed by Syngenta Crop Protection. It has been evaluated extensively in the past, both in the public and private sector as CGA-362622. Topical applications of Envoke have in some cases resulted in cotton injury. Numerous foliar insecticides are used in cotton production, and many undergo different metabolism pathways within the cotton plant. In many cases, tank-mixing herbicides with insecticides have resulted in phytotoxic interactions to cotton when neither constituent applied alone resulted in injury. In many situations, producers desire to tank-mix herbicides with insecticides to achieve broad spectrum pest control with a single application. Therefore, greenhouse and field studies were conducted at the Plant Science Research Center, Starkville, MS, and the Black Belt Experiment Station, Brooksville, MS, to determine the effects of tank-mixing Envoke (CGA-362622) with currently used foliar insecticides. The insecticides evaluated were 1.0 lb ai/A acephate, 0.5 lb ai/A dicrotophos, 1.0 lb ai/A profenophos, 0.1 lb ai/A bifenthrin, 0.04 lb ai/A cyhalothrin, 0.047 lb ai/A indoxacarb, and 0.089 lb ai/A spinosad. All insecticides were applied alone, and tank-mixed with 0.1 oz product/A of Envoke. Treatments were made to cotton at the pin-head square growth stage in both greenhouse and field experiments. In the greenhouse study, injury was evaluated on a 0 to 100 % scale 7 and 14 days after treatment (DAT), with 0% being no injury and 100% is total death of the plant. Plant heights were taken 7 and 14 DAT, and fresh weights were collected at 14 DAT. In the field study, injury ratings were taken on a 0 to 100% scale 7 and 14 DAT, and yield data were collected at maturity.

In the greenhouse study, tank-mixtures of Envoke plus either acephate, or profenophos, resulted in 14 and 28.3 % more injury 7 DAT, respectively, than Envoke alone. Fourteen days after treatment, tank-mixes of Envoke plus either acephate, profenophos, bifenthrin, cyhalothrin, or indoxacarb resulted in 18, 46, 27, 8, and 12 % injury, respectively, over Envoke alone in the greenhouse. In the field study, no treatment combination resulted in more crop injury than Envoke applied alone 7 or 14 DAT. Plant heights taken in the greenhouse 7 and 14 DAT, for all treatments, were not significantly different than Envoke alone. Seed cotton yield, for all treatments in the field experiment, were not significantly different than the untreated check. Injury symptoms were shown to be higher in the greenhouse than in the field experiment, for all rating dates. Of all the classes of insecticides used, the organophosphates resulted in more injury when applied in combination with Envoke. The application timings that Envoke will be utilized as a POT treatment correlates at the same time that organophosphate insecticides will be used. These data indicate that Envoke may have interaction potential with organophosphate insecticides. Additional testing is needed under a variety of growing conditions to adequately determine the interaction potential when applied under field conditions.