INTEGRATION OF ISOXAFLUTOLE INTO COTTON HERBICIDE PROGRAMS

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Abstract

The evolution of herbicide resistance by troublesome weeds such as Palmer amaranth (*Amaranthus palmeri* S. Watson) has limited the number of weed control options in cotton. As of current, there are seven sites of action to which Palmer amaranth has developed resistance, prompting the search for more effective herbicide options in cotton (*Gossypium hirsutum* L.). 4-Hydroxyphenylpyruvate dioxygenase herbicides such as isoxaflutole (IFT) have been shown to be effective at controlling small-seeded broadleaf weeds such as Palmer amaranth in corn (*Zea mays* L.) but is currently not available in cotton. The recent development of IFT-resistant cotton by BASF will allow for the integration of a new effective sites of action in cotton. To determine the utility of the addition of IFT into cotton weed control programs a study was conducted in the fall of 2019 in Marianna, AR evaluating nine different herbicide programs. The study was conducted as a one-factor, randomized complete block design with the treatments consisting of different programs utilizing different preemergence, early-postemergence, and mid-postemergence programs containing different typical cotton herbicides with and without the addition of IFT. Some treatments also utilized a layby application of flumioxazin and MSMA. Applications were made with a pressurized gas backpack sprayer at 15 GPA at 3 mph. Visual estimates of weed control were taken every 7 days after each application until 35 days after layby and data were analyzed in a fit model using JMP Pro 14.2 and means were separated using Fisher's protected LSD (a = 0.05). The results from this study show that the use of IFT in cotton herbicide programs provided improved control of Palmer amaranth as a preemergence or early-postemergence option than those that do not. Average Palmer amaranth control 21 days after the early-postemergence application was 94% for treatments containing IFT compared to 79% for those that did not. The study also found that the use of residual herbicides with each postemergence application and the use of layby applications provided lasting weed control through the end of the season.