ENLIST COTTON RESPONSE TO LOW RATES OF DICAMBA

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Abstract

Weed control by use of herbicides is an important tactic in successful crop production. To combat the rise in evolution of herbicide-resistant weeds, new cotton technologies have been developed that allow the in-crop use of dicamba and 2,4-D. As these new technologies are adopted, applications of synthetic auxin herbicides will increase, thus, increasing the likelihood of herbicide drift onto susceptible crops. A field study was conducted at the Delta Research and Extension Center, in Stoneville, MS, to evaluate the response of Enlist cotton (*Gossypium hirsutum*) growth stages to low rates of dicamba. Enlist cotton (PHY 350 W3FE) was planted on beds with 40-inch row spacing with a seeding rate of 4 seed ft^{-1} on May 11, 2020 and emerged May 18. The experiment was arranged as a randomized complete block design with a factorial treatment structure and four replications. Two factors were included: growth stage (3- to 4-leaf, square, and flowering) and Clarity (dicamba) rate [1/16X + non-ionic surfactant (NIS) at 0.25% (v/v), 1/32X + NIS, 1/64X + NIS]. The 1X of Clarity is 16 fl oz/A. A nontreated check was included for comparison. Applications were made (two center rows) at three cotton growth stages: three- to four-leaf (June 7), at square (June 30), and at flowering (July 15).

Cotton was more injurious at the square (20%) and flowering (14%) growth stages than 3- to 4-leaf (1%) averaged over Clarity rates at 10 weeks after emergence (WAE). At 14 WAE, cotton injury was 20% for Clarity at 1/16X at the square and flowering growth stages. Furthermore, cotton injury was similar for Clarity at 1/32X at the square and flowering growth stages. When averaged over Clarity rates, cotton height was 34, 33, 35, and 37 inches for 3- to 4-leaf, square, flowering, and the nontreated check, respectively. For seedcotton yield, Clarity at 1/16X (2,921 lb/A) reduced yield by 40% (averaged over growth stages) as compared to nontreated check (4,844 lb/A). Treatments at the square and flowering growth stages showed 19% reduction in seedcotton yield (averaged over Clarity rates). Based on these results, susceptible cotton varieties can be vulnerable to herbicide drift. The severity of injury following exposure to low rates of Clarity can be difficult to determine but understanding the risks and outcomes can be beneficial in making the best recommendation. For seedcotton yield, cotton at the reproductive growth stage was most sensitive than vegetative stage to simulated drift rate of Clarity.