XTEND COTTON RESPONSE TO LOW RATES OF 2,4-D

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Abstract

A field study was conducted at the Delta Research and Extension Center, in Stoneville, MS, to evaluate the response of Xtend cotton growth stages to low rates of 2,4-D. Xtend Cotton (DP 1646 B2XF) 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 design with a factorial treatment structure and four replications. Two factors were included: growth stage (3- to 4-leaf, square, flowering) and 2,4-D rate [1/16X + non-ionic surfactant (NIS) at 0.25% (v/v), 1/32X + NIS, and 1/64X + NIS]. The 1X rate of 2,4-D is 32 fl oz/A. A nontreated check was included for comparison. The 2,4-D application date for 3- to 4-leaf, square, and flowering stage of cotton was June 7, June 30, and July 15, respectively.

At 12 weeks after emergence (WAE), cotton injury was greatest (43%) for 2,4-D at 1/16 X at the square growth stage. In general, cotton was more injurious at the square stage. At 12 and 15 WAE, 20 and 24% cotton injury were observed for 2,4-D at 1/64 X at the flowering growth stage, respectively. Cotton height at 11 WAE ranged from 42 to 44 inches at the flowering growth stage. The percentage of cotton boll opening was 1, 4, and 6% for 2,4-D at 1/16 X, 1/32 X, and 1/64 X by 18 WAE, respectively (averaged over growth stage). The cotton boll opening in the nontreated plot was 91%. Seedcotton yield were reduced across all treatments. When 2,4-D at 1/16 X applied at three- to four-leaf, square, and flower growth stages, reduced seedcotton yield 66, 91, and 88%, respectively as compared to nontreated check (4,459 lb/A). Based on these results, susceptible cotton varieties can be vulnerable to herbicide drift. Although the Xtend technology allows for in-crop use of dicamba, this trait does not mean that exposure to low rates of 2,4-D will not affect cotton tolerance or yield. All treatments exhibited levels of injury that would not be acceptable to a cotton producer. The severity of injury following exposure to low rates of 2,4-D is very difficult to determine; however, understanding the risks and outcomes can be beneficial in making the best recommendation. Overall, the sensitivity of cotton growth stage from simulated drift rates of 2,4-D was as follows: square > flowering > three- to four-leaf stage.