RESPONSE OF COTTON AT DIFFERENT GROWTH STAGES TO LOW RATES OF ENLIST DUO

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Abstract

A field study was conducted at the Delta Research and Extension Center in Stoneville, Mississippi, in 2018 to evaluate the response of cotton (Stoneville Bollgard II 4747GLB2) growth stages to simulated drift rates of Enlist Duo (2,4-D choline + glyphosate). Cotton was planted on May 01, 2018. The experiment was designed as a randomized complete block with a 3 (cotton growth stage) by 5 (Enlist Duo rates) factorial treatment arrangement. Each treatment was replicated three times. Applications were made at three cotton growth stages: three- to four-leaf, at square, and at flowering. Enlist Duo was applied at 1/16 X, 1/16 X + non-ionic surfactant (NIS) at 0.25% (v/v), 1/32 X, and 1/32 X + NIS (simulated drift rates) rates of the labeled rate (1 X). A nontreated check was included. The labeled rate (1 X) of Enlist Duo was 75 fl oz/A.

Both Enlist Duo rates injured cotton at the same level (21% to 22%) except Enlist Duo at 1/16 X + NIS (averaged over growth stages). The addition of NIS to Enlist Duo at 1/16 X application increased cotton injury to 26%. The level of cotton injury in terms of growth stage was as follows: three- to four-leaf (24%) > square (19%) > flowering (10%) stage (averaged over Enlist Duo rates) at 10 weeks after emergence (WAE). Cotton did recover from injury by 13 WAE when Enlist Duo was applied at three- to four-leaf stage. However, cotton did not recover from injury when Enlist Duo was applied at square or flowering stage by three weeks later. All Enlist Duo application rates reduced cotton height as compared to nontreated check (averaged over growth stages). At 15 WAE, 52% of cotton bolls were opened in nontreated check, however, no cotton bolls (0%) were opened in treatments that received the Enlist Duo applications (averaged over growth stages). All Enlist Duo applications reduced seedcotton yield as compared to the nontreated check (averaged over growth stages). The sensitivity of cotton growth stage from Enlist Duo drift in terms of seedcotton yield was as follows: flowering > square > three- to four-leaf stage (averaged over Enlist Duo rates). Enlist Duo application at 1/16 X + NIS reduced seedcotton yield from 6,059 lb/A (nontreated check) to 1,986 lb/A (averaged over growth stage). These data indicate that Enlist Duo stopped/delayed cotton growth from the time of application and there was no recovery from Enlist Duo injury (except three- to four-leaf stage). The results indicate that cotton at any growth stage is susceptible to injury from Enlist Duo drift as seedcotton yield was reduced by > 58% with any application rate of Enlist Duo.