DICAMBA-TOLERANT COTTON RESPONSE TO LOW RATES OF 2,4-D

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Abstract

The adoption of auxin-tolerant cotton (*Gossypium hirsutum*) has increased the number of preplant and postemergence applications of dicamba and 2,4-D choline to aid in the control of troublesome broadleaf weeds including glyphosate-resistant Palmer amaranth (*Amaranthus palmeri* S. Wats). An increase in the amount of dicamba and 2,4-D choline applied enhances the risk of off-target movement to non-target crops. A field study was conducted in 2019 at the Texas Tech University New Deal Research Farm equipped with subsurface drip irrigation to evaluate dicamba-tolerant cotton response to 2,4-D choline when applied at four crop growth stages (first square + two weeks, first bloom, first bloom + two weeks, and first bloom + four weeks). Rates of 2,4-D choline applied were: 0.95 (1X), 0.095 (1/10X), 0.019 (1/50X), 0.0095 (1/100X), 0.0019 (1/500X), and 0.00095 (1/1000X) lb. ae/a to Deltapine 1822 B2XF using a CO_2-pressurized backpack sprayer with a carrier volume of 15 gallons per acre using TTI11004 nozzles. Plots, four rows spaced 40-inches apart by 30 feet in length, were replicated four times and kept weed-free throughout the growing season. Cotton was box mapped prior to harvest to determine boll number and distribution as affected by the different rates and timings of 2,4-D. Plots were machine harvested to determine lint yield. Fiber quality measurements were analyzed at the Fiber & Biopolymer Research Institute at Texas Tech University. Relative to the non-treated control, total boll number decreased following all rates and timings of 2,4-D. Boll production was decreased above node 11 at first square + two weeks, above node 13 at first bloom, above node 14 at first bloom + two weeks, and above node 15 at first bloom + four weeks from all rates of 2,4-D. Lint reductions were observed following all rates and timings excluding 1/500X at first bloom + two weeks. Micronaire decreased from 4.4 (non-treated control) to 2.6 following 1X rate of 2,4-D choline at first bloom + four weeks. Following the 1/10X rate, micronaire was 3.5 following the first square + two weeks application and 3.75 after the first bloom application. Although significant lint reductions were observed following most rates and application timings, micronaire only varied from the non-treated at the 1/10X rate at first square + two weeks and first bloom, as well as the 1X rate at first bloom + four weeks.

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