THREE YEAR EVALUATOIN OF HERBICIDE PROGRAMS IN XTENDFLEX™ COTTON

C.A. Samples
D.M. Dodds
S. Davis
Mississippi State University
Mississippi State, MS

Abstract

Due to the continued spread of glyphosate resistant Palmer amaranth (*Amaranthus palmeri*), technologies have been developed allowing growers to apply auxin-type herbicides post emergence to cotton. XtendFlex® technology from Monsanto will allows growers to apply glypohsate, glufosinate, and dicamba over the top of cotton (*Gossypium hirsutum L.*). Dicamba applied at 1.1 kg ae ha^{-1} has been shown to provide up to 90 percent Palmer amaranth control. Dicamba tank mixed with glufosinate increased Palmer amaranth control over dicamba alone. Dicamba has also been observed to control other glyphosate resistant species 79 to 100 percent 14 days after application.

Experiments were conducted in 2015, 2016, and 2017 in Starkville, MS at the R. R. Foil Plant Science Research Center and in Brooksville, MS at the Black Belt Branch Experiment Station. Plots consisted of 4-1 m spaced rows that where 12.2 m in length. Each plot was replicated four times. DP 1522 B2XF was planted in Starkville and Brooksville. Applications were made on 2-4 leaf cotton with a CO_2-powered backpack sprayer calibrated to apply 140 L ha^{-1} @ 317 kpa while walking 4.8 kph. Treatments applied to DP 1522 B2XF included glyphosate @ 1.1 kg ae ha^{-1}, glufosinate @ 0.6 kg ai ha^{-1}, S-metolachlor @ 1.07 kg ai ha^{-1}, dicamba (Engenia) @ 0.6 kg ae ha^{-1}, dicamba (Clarity) @ 0.6 kg ae ha^{-1}, and dicamba (MON 119096) @ 0.6 kg ae ha^{-1} either alone or in combination. Visual injury ratings were made 3, 7, 14, 21, and 28 days after applications. Other data collected included height at 1st bloom, height at the end of the season and lint yield. Data were analyzed using the PROC MIXED procedure in SAS version 9.4 and means were separated using Fisher's protected LSD at p=0.05.

All six of the highest injury levels 3 days after application on DP 1522 B2XF were from treatments containing glufosinate and S-metolachlor in which visual injury ranged from 36- 42 percent. The highest level of injury came from treatments containing dicamba (Engenia) + glyphosate + glufosinate + S-metolachlor. Similar to 3 days after application, five of the six treatments with the highest level of injury seven days after application contained glufosinate and S-metolachlor with injury levels ranging from 26-31 percent. At 14 days after application injury to DP 1522 B2XF had dissipated however, five of the six highest levels of injury contained glufosinate + S-metolachlor and cotton injury ranged from 12-14 percent. At 21 Days after application, cotton injury had further dissipated but significant differences persisted with the highest levels of injury still being attributed to treatments containing glufosinate+S-metolachlor. Significant differences persisted through bloom with height of cotton treated with cotton subjected the most injurious treatments being shorter than the untreated check. Heights ranged from 63 cm -70 cm. Similarly, height at the end of the season was affected, however differences were less than 2.5 cm. There were no significant differences in lint yield at the end of the season with yields ranging from 1,589-1,777 kg lint ha^{-1}.