# POTENTIAL CROP INJURY WITH EARLY POST APPLICATIONS IN XTENDFLEX COTTON

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## 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. The XtendFlex® technology from Monsanto will allow growers to apply glyphosate, glufosinate, and dicamba over the top of cotton (*Gossypium hirsutum L.*). Dicamba applied at 1.1 kg ae $ha^{-1}$ provided 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. As of 09 November 2016, the use of Xtendimax is labeled in XtendFlex® cotton and soybeans. However, currently no tank mix partners are allowed with Xtendimax. Since the development of glyphosate resistance, early POST applications with several modes of actions have become common. However, the crop injury potential from these applications needs to be further examined.

Experiments were conducted 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, nodes above white flower (NAWF) at 1st bloom, nodes above cracked boll (NACB) at the end of the season and, 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 37-47 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 27-32 percent. At 14 days after application injury to DP 1522 B2XF had dissipated and ranged from 3-12 percent. At 21 Days after application, cotton injury had further dissipated and there were no significant differences observed amongst treatments. There were no significant differences in cotton height at first bloom with heights ranging from 61-69 cm. Similarly, there were no significant differences associated with NAWF or NACB with NAWF ranging from 6.8-7.2 NAWF and NACB ranging from 3.6 -4.5, respectively. This indicates that there were no signs of delayed maturity at first bloom or at the end of the year. Furthermore, there were no significant differences in lint yield at the end of the season with yields ranging from 1,904-2,119 kg lint $ha^{-1}$.