GLYPHOSATE RESISTANT HORSEWEED IN MISSOURI COTTON: A THREE YEAR SUMMARY

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Abstract

Glyphosate-resistant horseweed (*Conyza canadensis*) was found in Pemiscot County Missouri in 2002. It has developed into significant weed in cotton, especially in fields utilizing reduced tillage programs. Problems still exist as to the most effective spring application (burndown) timing to maximize control. Questions still remain regarding the efficacy of using herbicides applied in the fall and spring to provide a residual control to prevent any future germination of horseweed seed.

Two studies were implemented in 2005, one evaluating the proper application timing of growth regulator herbicides and one evaluating the use of effectiveness of fall and spring applied preplant herbicides. There was a mixed population of both glyphosate resistant and susceptible Horseweeds in these studies. The preplant study was a factorial combination of three application times (November, January and March) and seven herbicide treatments, pendamethalin at 1.68 kg ai/ha, simazine at 1.12 kg ai/ha, fluometuron at 1.12 kg ai/ha, linuron at 1.12 kg ai/ha, diuron at 1.12 kg ai/ha, oxyfluorfen at 0.28 kg ai/ha, flumioxazin at 0.07 kg ai/ha and an untreated check. The residual herbicides and control were all applied along with glyphosate at 0.83 ae/ha and 2,4-D at 1.12 kg ai/ha.

In the fall of 2006, a second study evaluating the efficacy of the new residual herbicide trifloxysulfuron-sodium was incorporated. The design was factorial with three rates (0.0026, 0.0039, and 0.0052 kg ai/ha) of trifloxysulfuron-sodium in conjunction with four burndown herbicides, paraquat 0.7 kg ai/ha, dicamba at 0.28 kg ai/ha, 2,4-D at1.12 kg ai/ha, and glyphosate at 0.83 kg ae/ha across a single application timing in December. In both preplant studies horseweed control was evaluated at the time of cotton planting in mid-May and after cotton emergence to evaluate injury.

The third study evaluated horseweed control and cotton injury with growth regulator burndown herbicides at seven biweekly application timings between February 15th and May 4th. It was a factorial design using 2,4-D and dicamba, with 3 different rates of each herbicide; 0.5, 1, and 2 times the labeled rate for each. Horseweed stands were determined before cotton planting. Cotton was evaluated for growth-regulator type symptoms and picked for yield determination.

Data were subjected to analysis of variance and means separated using Fisher's LSD at α=0.05. Plot size was 2.2 by 7.6 m and the study was conducted using standard small plot weed science methodology, including CO2-pressurized backpack sprayers and XR8001 flat fan nozzles set at an application volume of 93 L/ha.

In the residual efficacy studies, with the exception trifloxysulfuron-sodium, all applications of residual herbicides made in the fall resulted in <70% control at the time of planting. Trifloxysulfuron-sodium provided good to excellent residual horseweed control from fall applications. In the first study, there were no observed increase in horseweed control between spring burndown applications with residuals and those without. Cotton yield was not affected by preplant treatments.

In the burndown timing study, both early April and late April application timings for all 3 years resulted in no horseweed populations at the time of planting, indicating optimum timing for horseweed control. Early season burndown timings allowed for emergence later in spring. There were no statistical differences in horseweed control between 2,4-D and dicamba when used for burndown. With cotton planted in mid-May, growth regulator type crop injury was only found from burndown applications made in early May.