EVALUATING TIME OF DAY EFFECTS ON BROADLEAF WEED CONTROL IN XTENDFLEX® COTTON

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Abstract

Auxin analog herbicides (WSSA group 4) have recently gained much research attention due to the release of crop varieties that are tolerant to post-emergence (POST) applications of specific formulations of dicamba (3,6-dichloro-2-methoxybenzoic acid). The development of these herbicide resistant crops was driven by weed species development of herbicide resistance to commonly applied herbicides such as glyphosate (N-(phosphonomethyl) glycine). With increased use of auxin analog herbicides, it is necessary for researchers to develop an understanding of the most effective application methods. Many factors can influence herbicide efficacy, and one that is mostly in control of the grower is the time of day the herbicide is applied. Research was conducted examining herbicides applied over resistant cotton varieties at eight different times in a 24hr period, from 1 hr before sunrise to midnight. Herbicide treatments included glyphosate, dicamba, and glyphosate plus dicamba at the eight times in the 24 hour period in a randomized complete block design. Visual ratings of weed control on a 0-100% scale were then taken at 7, 14, 21, and 28 days after treatment (DAT). Each herbicide showed differences in efficacy with the times between noon and 1 hr prior to sunset showing the highest average control ratings. Across all weed species at 21 DAT for night and day applications; glyphosate control averaged 55% and 75% respectively, dicamba averaged 71% and 83% respectively, and the mixture averaged 74% and 92% respectively.

The purpose of this study was to quantify the effect that time of day has on the efficacy of herbicide application. For this study, XtendFlex® cotton was planted and over-seeded with three common and troublesome weed species; morningglory spp., sicklepod, and prickly sida. Treatments of glyphosate, dicamba, and a tank-mix of the two were applied at eight times in a 24hr period. The times varied throughout the day and night based on common times that a grower might be applying herbicides. A randomized complete block design was utilized across two locations in southern Georgia over two years, and visual ratings were taken at 7, 14, 21, and 28 days after treatment. Data was then analyzed and showed significant differences between several of the timings of treatment.