Effect of Postflood Timing and Single versus Sequential Clincher Applications on Barnyardgrass Control in Rice


ABSTRACT

Barnyardgrass continues to be a common and difficult-to-control weed in rice fields throughout Arkansas. Clincher (cyhalofop) is often applied late in the growing season to control large barnyardgrass plants that have escaped control with earlier applied herbicides, and control is often inconsistent. Research was conducted in 2007 and 2008 to determine the influence of postflood timing and to compare single and sequential cyhalofop applications on barnyardgrass control. All single and sequential applications of cyhalofop were highly efficacious on barnyardgrass in 2007, with all treatments providing at least 90% end-of-season control. In 2008, barnyardgrass plants were more robust, and control was generally less than in the previous year. Sequential cyhalofop applications were often needed for consistent control, and delaying the initial application to 21 d postflooding resulted in poor barnyardgrass control, even when using sequential applications.

INTRODUCTION

Barnyardgrass is the most problematic and common weed in Arkansas rice (Norsworthy et al., 2007). Unmanaged barnyardgrass can cause up to 87% rice yield loss (Stauber et al., 1991). Clincher (cyhalofop) is often applied postflood in rice for control.
of barnyardgrass and to prevent yield-reducing interference. As a result of the postflood timing, weather, or application issues, single postflood applications of cyhalofop often provide inconsistent control. Furthermore, if cyhalofop application is used as a salvage treatment, barnyardgrass plants are usually large at application, resulting in failure of cyhalofop to provide consistent control. Therefore, research was conducted to determine the influence of postflood timing and compare single and sequential cyhalofop applications for barnyardgrass control.

**PROCEDURES**

Experiments were conducted in 2007 and 2008 at the Rice Research and Extension Center in Stuttgart, Ark. ‘Wells’ rice was drill-seeded at 24 seed/ft of row on 18 April 2007, and 1 May 2008, in 7.5-in.-wide rows. The test site contained a natural infestation of barnyardgrass and was flooded both years at the 5- to 6-leaf (If) stage of rice. Herbicide treatments included cyhalofop at 0.28 lb ai/acre applied 1 d prior to flooding (PREFL), and 7, 14, and 21 d postflooding (PFL). Additional treatments included the previous timings followed by a second application of cyhalofop at 0.19 lb/acre at 14 d after the initial treatment. All cyhalofop treatments contained crop oil concentrate at 1% v/v and were applied at 10 gal/acre. A nontreated control was included. Crop injury and barnyardgrass control were rated weekly beginning 2 wk after the PREFL application. All data were subjected to analysis of variance, and means were separated using Fisher’s protected Least Significance Difference test at α = 0.05.

**RESULTS AND DISCUSSION**

End-of-season control of barnyardgrass in 2007 was similar between single and sequential applications for all timings, except the single 14-d PFL application (Fig. 1). Excluding the 14-d PFL application, barnyardgrass control in all cyhalofop treatments was at least 98% in 2007. Conversely in 2008, due in part to the later planting of rice, barnyardgrass exhibited more robust early-season growth and was more difficult to control with cyhalofop. Cyhalofop applied PREFL controlled barnyardgrass only 68% at 2 WAT (data not shown). Control further declined throughout the season, and end-of-season control was only 28% when a single cyhalofop application was made before flooding. Delaying the single application of cyhalofop to 7 d POSTFL improved barnyardgrass control, with end-of-season control averaging 91%. Barnyardgrass control declined with further delays in application timing, with end-of-season control averaging 78 and 10% when cyhalofop was applied at 14 and 21 d PFL. Following the PREFL with a PFL application improved late-season control to 89% in 2008, which was comparable to other sequential applications that were made 7 and 14 d PFL (90% control). Sequential applications that began 21 d POSTFL were not effective in controlling barnyardgrass, which averaged 46% control late in the season.

No rice injury was observed in either year (data not shown). Due to the high level of control in 2007 (Fig. 1), rice yields were comparable among herbicide treatments,
ranging from 152 to 169 bu/acre (data not shown). Delaying cyhalofop applications in 2008, including sequential applications, to 14 or 21 d PFL reduced rice yield, and single and sequential applications, with the first application made PREFL or 7 d PFL, resulted in comparable yields in 2008.

**SIGNIFICANCE OF FINDINGS**

This research shows that a single late-season cyhalofop application will not provide consistent barnyardgrass control across growing seasons. Under typical rice-growing conditions, it is advisable to make the first cyhalofop application as close to 7 d PFL as possible, which will offer the best single application control. However, sequential applications are needed for consistent control, and even then, delaying the initial application to 21 d PFL followed by an additional application may not result in acceptable barnyardgrass control.

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**LITERATURE CITED**


Fig. 1. End-of-season barnyardgrass control following single and sequential applications (14 d after initial treatment) of cyhalofop in 2007 and 2008. The first application of cyhalofop was applied at 0.28 lb/acre and the second application at 0.19 lb/acre. Means within a year followed by the same letter are not statistically different. Abbreviations: PREFL, preflood; PFL, postflood; DAT, days after initial treatment.