MANAGEMENT OF GLYPHOSATE-RESISTANT HORSEWEED FOR SOUTHERN ILLINOIS. Tracy G. Mellendorf, Bryan G. Young, Joseph L. Matthews, Graduate Research Assistant, Professor, and Researcher, Department of Plant, Soil, and Agricultural Systems, Southern Illinois University, Carbondale, IL 62901.

As glyphosate-resistant horseweed becomes more prevalent across southern Illinois, it is becoming increasingly important to incorporate additional modes-of-action with glyphosate applications. Glyphosate-resistant horseweed was confirmed in Illinois in 2006. Recommendations in adjoining states suggest 2,4-D and cloransulam as tank-mix partners with glyphosate to establish control of marestail. However, commercial experience in southern Illinois in 2006 demonstrated these tank-mix partners were inconsistent and often inadequate to meet grower expectations. Two field studies were conducted in 2006 and 2007 near Murphysboro, Illinois to evaluate herbicide strategies for control of glyphosate-resistant horseweed in soybeans. The majority of the horseweed populations were glyphosate-resistant with a small percentage remaining as glyphosate-susceptible.

The first study evaluated the potential interaction between glyphosate rate (860, 1260, and 1740 g ae/ha) and 2,4-D rate (530 and 1070 g ae/ha) as well as the efficacy of paraquat and glufosinate applied alone. Glyphosate applications resulted in slight chlorosis and temporary stunting prior to resuming normal growth. Glyphosate applied alone resulted in 53% or less control at 28 days after treatment (DAT) and no benefit was observed for increasing the rate of glyphosate. The combination of 2,4-D applied at 530 g/ha with glyphosate improved control of marestail but did not exceed 79% control. The maximum level of control observed with the higher rate of 2,4-D (1070 g/ha) applied with glyphosate was 92%. Interestingly, control of marestail was greater with 2,4-D applied at 1070 g/ha when the rate of glyphosate was increased from 860 g/ha to 1260 g/ha. This may be an artifact of the higher adjuvant concentration contributed from the glyphosate formulation rather than a true interaction of the herbicide active ingredients. Control of marestail at 28 DAT with paraquat and glufosinate averaged 97 and 94%, respectively.

In the second study all herbicide treatments consisted of two-pass programs that included a preplant burndown herbicide application and a subsequent postemergence in-crop application. Control of marestail at 14 days after the postemergence application was less than 75% when only glyphosate was used in the burndown and either cloransulam, chlorimuron and thifensulfuron, or 2,4-DB was used as a tank-mix with glyphosate for the postemergence application. This highlights that growers must achieve control of glyphosate-resistant marestail prior to planting since herbicide options after planting have limited efficacy. Applying cloransulam in combination with glyphosate in the burndown application resulted in greater control of marestail than cloransulam postemergence. Furthermore, utilizing cloransulam in the burndown application followed by cloransulam in the postemergence application did not result in any improvement in marestail control compared with cloransulam applied only in the burndown application. Thus, applying sequential applications of an ALS-inhibiting herbicide to emerged marestail plants will not improve control compared with the initial application of an ALS-inhibiting herbicide. Burndown applications that included paraquat, even when followed by just glyphosate postemergence, resulted in 96% or greater control of marestail at 14 days after the postemergence treatment. Only herbicide treatments that included 2,4-D or paraquat resulted in maximum soybean yield. This research suggests that paraquat, glufosinate and 2,4-D (1070 g/ha) have the greatest utility in burndown applications for control of glyphosate-resistant marestail with the ALS-inhibiting herbicides being used for in-crop management of glyphosate-resistant marestail or soil residual activity.

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