

FALL APPLICATIONS OF RESIDUAL HERBICIDE MIXTURES**Henry M. Edwards****Jason A. Bond****Thomas W. Eubank****Garret B. Montgomery****Mississippi State University****Stoneville, MS****Abstract**

Fall-applied residual herbicides provide excellent control of winter annual weeds. These applications are commonly recommended in Mississippi for management of glyphosate-resistant horseweed [*Conyza canadensis* (L.) Cronq.] and Italian ryegrass [*Lolium perenne* L. ssp. *multiflorum* (Lam.) Husnot.]. Fall applications are advantageous because they target weeds in an earlier developmental stage when they are easier to control. Research at the Mississippi State University Delta Research and Extension Center in Stoneville has documented that fall-applied residual herbicides offer the best opportunity to control GR Italian ryegrass. Dual Magnum (s-metolachlor) is commonly applied in the fall in Mississippi for GR Italian ryegrass control. However, Dual Magnum is often less effective on some winter annual broadleaf weeds compared with other residual herbicides. Therefore, research was initiated to evaluate mixtures of Dual Magnum with other residual herbicides. The objective of this research was to evaluate the efficacy of fall applications of Dual Magnum applied in mixtures with other residual herbicides.

The study was conducted in 2011-12 at an on-farm site near Elizabeth, MS, known to be infested with GR Italian ryegrass. Soil at the research site was a Dundee very fine sandy loam with a pH of 6.7 and 1.2% organic matter. Individual plots were 10 by 40 feet. The experimental design was a split plot with four replications. Whole plots consisted of Dual Magnum at 0 or 1.27 lb ai/A. Subplots were residual herbicides applied in mixture with Dual Magnum and consisted of no tank-mix herbicide, Authority MTZ (sulfentrazone + metribuzin) at 0.338 lb ai/A, Direx (diuron) at 0.75 lb ai/A, Goal 2XL (oxyfluorfen) at 0.25 lb ai/A, and Sencor (metribuzin) at 0.375 lb ai/A. Herbicide treatments were applied on November 7, 2011. All applications included Gramoxone SL (paraquat) at 0.75 lb ai/A and a crop oil concentrate at 1% (v/v) to control any GR Italian ryegrass emerged at the time of application. All herbicide treatments were applied using a tractor-mounted, compressed-air boom equipped with regular flat-fan nozzles calibrated to deliver 15 gallons per acre at 40 psi. Control of henbit and GR Italian ryegrass was visually estimated 42 and 134 days after treatment (DAT) on a scale of 0 to 100% with 0 = no control and 100 = complete control. Data were subjected to ANOVA with means separated by Duncan's multiple range test at $P=0.05$.

When applied alone, Authority MTZ, Goal 2XL, and Sencor controlled more GR Italian ryegrass 42 DAT than Direx. Authority MTZ applied alone controlled GR Italian ryegrass as well as mixtures that included Dual Magnum 42 DAT. Authority MTZ, Direx, Goal 2XL, and Sencor controlled GR Italian ryegrass less than 60% 134 DAT when applied without Dual Magnum. The treatments that included Dual Magnum controlled GR Italian ryegrass at least 86% at both evaluations. The addition of Authority MTZ, Direx, Goal 2XL, or Sencor did not improve GR Italian ryegrass control compared with Dual Magnum alone at either evaluation. With the exception of Authority MTZ at 42 DAT, GR Italian ryegrass control was greater at both evaluations when Dual Magnum was included with other residual herbicides. Henbit was controlled 91 to 95% following all treatments. The addition of Authority MTZ, Direx, Goal 2XL, or Sencor did not improve henbit control compared with Dual Magnum alone at either evaluation.

Dual Magnum applied alone or in mixtures with other residual herbicides controlled GR Italian ryegrass at least 86% 134 DAT. This is similar to control reported previously for Dual Magnum. Other residual herbicides applied alone controlled GR Italian ryegrass less than Dual Magnum. Mixtures of Dual Magnum with other residual herbicides were not required for control of GR Italian ryegrass or henbit. Rainfall through the fall and winter can impact fall-applied residual herbicide treatments. It can also influence when GR Italian ryegrass emerges. Although GR Italian ryegrass and henbit were controlled with Dual Magnum alone at 134 DAT in the current research, data from this study only represent one year and one location. Had the work been conducted over multiple years or locations, residual herbicide mixtures may have been required to achieve the same level of control as with Dual Magnum alone.