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Abstract

Research was conducted in 2007 at the Dean Lee Research and Extension Center in Alexandria, La, to evaluate coapplication effects on weed control of glyphosate and zinc. Treatments were arranged as a 3 X 3 factorial and included three formulations of glyphosate: (isoproplyamine salt @ 0.75 ae/A, potassium salt @ 0.75 ae/A, and diammonium salt @ 0.75 ae/A) and three zinc options: (no zinc, RSA[®] 7% ZnSO₄ @ 2 gt/A, and TraFix[®] 10% ZnSO₄ @ 2 qt/A). Treatments were applied to barnyardgrass (*Echinochloa crus-galli*), browntop millet (*Urochloa* ramosa), johnsongrass (Sorghum halepense), ivyleaf morningglory (Ipomoea hederacea), and redroot pigweed (Amaranthus retroflexus) when weeds were between 3 to 5 leaf and 3 to 6 inches. A nontreated control was included. Weeds were planted in trade gallon nursery containers (17 x 16.5 cm) three per pot and thinned to one plant per pot prior to treatment. Treatments were applied with a tractor mounted compressed air sprayer at 15 GPA. Experimental design was a randomized complete block replicated four times and the entire experiment was conducted two times in 2007. Visual assessment of weed control was conducted 7 and 14 d after treatment (DAT). At 14 DAT, plants were clipped at the soil line and fresh weight was determined and converted to fresh weight reduction from the non treated control. Data from the nontreated control was used for visual reference of control ratings and for conversion of fresh weight to a percent reduction from the control, but was not included in the statistical analysis. Visual control and fresh weight reduction data were analyzed as a randomized complete block with a factorial arrangement of treatments. Data analysis allowed for the combination of studies (study 1 and study 2) and rating intervals (7 and 14 DAT) for visual weed control data. Data analysis allowed for the combination of studies (study 1 and study 2) for fresh weight reduction data. All data analysis was conducted using PROC MIXED and means were separated using Tukey's HSD at the 0.05 level of probability.

For all parameters measured, a significant glyphosate by zinc interaction was not observed. Averaged across zinc options, no weed control differences among glyphosate formulations were observed and control of barnyardgrass, browntop millet, johnsongrass, ivyleaf morningglory, and redroot pigweed ranged from 47 to 48, 50 to 53, 60 to 63, 43 to 48, and 68 to 71%, respectively. Averaged across glyphosate formulations, weed control differences among zinc options were observed. Control of weeds evaluated was greatest when no zinc was chosen and weed control for all weeds ranged from 82 to 98%. Control of barnyardgrass and johnsongrass was 35 and 48%, respectively, from co-application with RSA[®], which was higher than co-application with TraFix[®] (23 and 39%, respectively). For browntop millet, ivyleaf morningglory, and redroot pigweed, control between RSA[®] and TraFix[®] was not different, with resulting control ranging from 30 to 35, 26 to 29, and 54 to 56%, respectively.

When averaged across zinc options, fresh weight reduction among glyphosate formulations was similar for all weeds and reduction ranged from 41 to 74%. When averaged across glyphosate formulations, differences among zinc options were once again noted. When no zinc was chosen, barnyardgrass, browntop millet, johnsongrass, ivyleaf morningglory, and redroot pigweed were reduced in biomass by 91, 96, 95, 88, and 94%, respectively, which was greater than choosing RSA[®] and TraFix[®]. No differences between RSA[®] and TraFix[®] were detected, and biomass

reduction for barnyardgrass was 32 and 18%, browntop millet 45 and 39%, johnsongrass 50 and 38%, ivyleaf morningglory 34 and 38%, and redroot pigweed 58 and 58%, for RSA[®] and TraFix[®], respectively.

When co-applied with any glyphosate formulation used in this study, both $RSA^{\ensuremath{\mathbb{R}}}$ and $TraFix^{\ensuremath{\mathbb{R}}}$ zinc products applied at 2 qt/A greatly compromised weed control. Growers should be aware of this antagonism and these co-applications should not be recommended.