ROUNDUP AND STAPLE INTERACTIONS: WEED CONTROL

J.A. Kendig
University of Missouri Delta Center
Portageville, MO

Abstract

Roundup and Staple have several complementary, off-setting strengths and weaknesses. Roundup has good activity on perennials, grasses and cocklebur and has a potentially low cost; however, it has no residual activity and can be weak on morningglory and velvetleaf. Staple has relatively good morningglory and velvetleaf activity and residual control. However, Staple provides inadequate grass control, may not control larger cocklebur and is relatively expensive. A Roundup-Staple tank mixture would appear to be advantageous; however, tank mixtures of other herbicides often interact and result in reduced weed control or unacceptable crop injury.

Tank-mixture and single applications of Roundup and Staple were used to evaluate synergistic and antagonistic effects. Treatments were a 3 by 2 by 2 factorial combination of one versus one-half versus one-quarter of label use rates; Roundup and Staple; and early versus late application timings. The label rates were designated as 0.75 lb ae/A of glyphosate (1 quart of regular Roundup) and 1 oz ai/A of Staple (1.2 oz of product/A). A "bare-ground" field study evaluated cocklebur control and did not include the 1/4-of-label rates. A greenhouse study evaluated ivy/entireleaf morningglory (*Ipomoea hederacea*), velvetleaf/wild cotton (*Abutilon theophrasti*) and prickly sida/teaweed (*Sida spinosa*). Velvetleaf and prickly sida populations were poor and these data will not be reported. Glyphosate-resistant cotton (Roundup Ready) was not tested in either study.

Data were subjected to analysis of variance (ANOVA) and LSD values were determined at the 5% level of significance. Colby expected control values were calculated using the formula $E = (X + Y) - ((X * Y)/100)$ where X represents the control from one herbicide alone, Y represents the control from the other herbicide alone and E represents the expected level of control from the a tank mixture of both herbicides at the tested rates. Arithmetic operations with variables result in increased variances; however, the normal LSD values were used when comparing Colby-expected values with the observed control values.

There were no consistent trends in the 26 expected-versus-observed comparisons. Weed species and application timing also had no consistent effect on the interactions. Six comparisons were significantly antagonistic, six comparisons were numerically antagonistic, one comparison was numerically equal, 11 comparisons were numerically synergistic and two comparisons were significantly synergistic.

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