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**Comparison of adjuvants used with glyphosate for weed control in sugar beet.**

### ABSTRACT

A study was conducted at the University of Idaho Research and Extension Center near Kimberly, Idaho to compare various adjuvants applied with glyphosate at two rates. In previous studies, no differences in weed control response were observed using the 0.75 lb ae/A glyphosate rate with various adjuvants. In 2010, a study was conducted using the minimum recommended rate and one half of the minimum rate with various adjuvants. Sugar beet was planted April 15, 2010, at a seeding rate of 71,280 seed/A. Experimental design was a randomized complete block with four replications and individual plots were 7.33 by 30 ft. Herbicides and adjuvants were applied with a CO<sub>2</sub>-pressurized bicycle-wheel sprayer calibrated to deliver 15 gpa at 26 psi using 8001 flat fan nozzles. The adjuvants tested included: Bronc (three rates), Bronc Max, Bronc Plus Dry EDT, R-11, Coverage G-20, Alliance, and Class Act NG. The major weed species were kochia (*Kochia scoparia* L. Schrad.), common lambsquarters (*Chenopodium album* L.), redroot pigweed (*Amaranthus retroflexus* L.), Russian thistle (*Salsola tragus* L.), hairy nightshade (*Solanum physalifolium* Rusby), and green foxtail (*Setaria viridis* (L.) Beauv). Crop injury and weed control were evaluated 8, 23, and 86 days after the last application on July 7, 22 and September 23, respectively. Only the weed control and crop injury from the first and last evaluation dates are reported. The two center rows of each plot were harvested mechanically October 7.

None of the treatments injured the crop. Glyphosate applied at 0.75 lb ae/A with or without any of the adjuvants tested had better overall weed control than glyphosate applied at 0.35 lb ae/A with or without any adjuvant. Some weed species such as redroot pigweed, hairy nightshade, and green foxtail were effectively controlled with 0.35 lb ae/A with or without an adjuvant. However, kochia, common lambsquarters and Russian thistle control were variable depending on the adjuvant used and glyphosate rate. Glyphosate at 0.35 lb ae/A + Alliance at 1.25% v/v had the best overall weed control with the lower glyphosate rate. However, most of the glyphosate treatments applied at 0.75 lb ae/A controlled one or more weed species better than glyphosate + Alliance at 0.35 lb ae/A + 1.25% v/v. Root yields ranged from 1 to 34 ton/A and sucrose yields ranged from 368 to 9,283 lb/A. The lowest yielding treatments were glyphosate applied at 0.35 lb ae/A + Bronc Max + R-11 + Coverage G-20 and glyphosate + Alliance + sucrose. Sugar beet root and sucrose yields were ranked in the same order, which indicates that herbicide treatment did not influence sugar content.