

Evaluation of soil-applied adjuvants to improve weed control

Andrew Kniss

Camby Reynolds

Sam George

Methods:

Soil applied adjuvants are being marketed to improve soil distribution of herbicides and improve weed control. A field study was conducted under sprinkler and furrow irrigation in 2020 at the Powell Research and Extension Center to evaluate whether one such soil adjuvant, ORO-RZ, improved weed control with soil-applied herbicides. Herbicides with a range of water solubility and soil adsorption parameters were applied with and without ORO-RZ at recommended rates. Herbicides selected for the study included Sonalan, Prowl, Outlook, Atrazine, Clarity. The study was a factorial randomized complete block design with 6 replicates. Treatments were applied in a 25 cm band (10 inches) on June 9, 2020. Weed control efficacy was evaluated by measuring the weed free bandwidth and by counting emerged weeds within the treated areas on July 2 and again on July 13. Data from both evaluation dates were combined for analysis.

Results:

Generally, ORO-RZ did not improve weed control (Figure 1) and did not have a consistent effect on the weed-free band width (Figure 2). Specifically for the dry bean herbicides, there were few statistically significant ($P < 0.05$) differences, and in some cases those differences suggest that ORO-RZ decreased weed control (for example, kochia with Prowl H2O and common purslane with Sonalan). These differences are attributed to typically variable weed distribution at the study site. The weed-free band width is a measure commonly used to illustrate the benefits of soil adjuvant products, but our work suggests the weed free band-width was not meaningfully affected by the addition of ORO-RZ. These results suggest that this soil adjuvant had insufficient benefit for residual herbicide efficacy to warrant their use. This is only one year of research, though, and results may differ under different environmental conditions or with different weed species or herbicides.

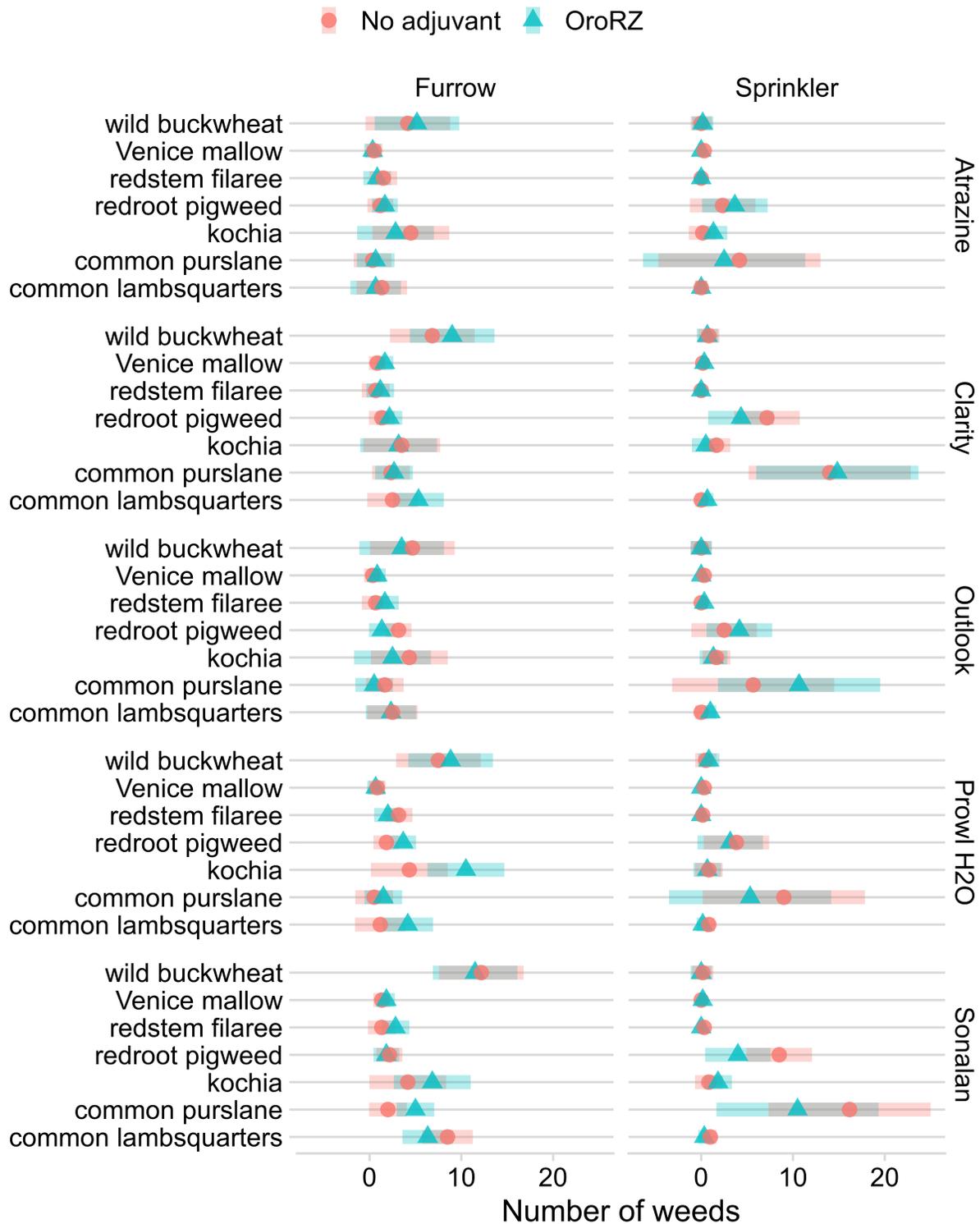


Figure 1. Number of weeds in herbicide treatments with and without soil adjuvant ORO-RZ. Shapes represent treatment means, and transparent bands represent 95% confidence intervals around the mean. If a confidence interval includes both treatment means, they are not statistically meaningful differences.

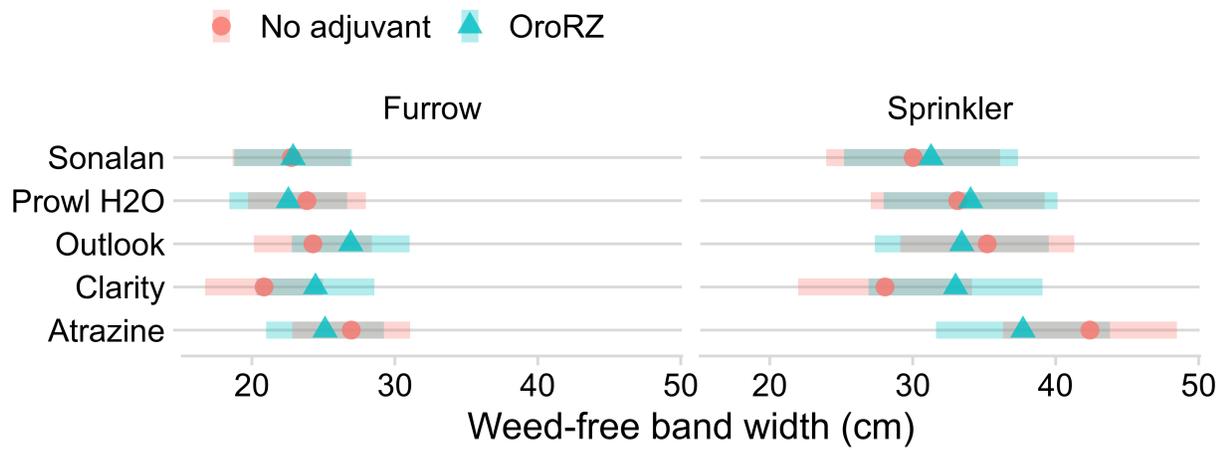


Figure 2. Weed free band-width with and without the soil adjuvant OroRZ for 5 different herbicides under furrow and sprinkler irrigated conditions. Shapes represent treatment means, and transparent bands represent 95% confidence intervals around the mean. If a confidence interval includes both treatment means, they are not statistically meaningful differences.