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Influence of fluorinated surfactants on the efficacy of some post-emergence sulfonylurea herbicides

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Abstract:
Fluorinated non-ionic surfactants were assessed as adjuvants for tribenuron-methyl, triflusulfuron-methyl and foramsulfuron. The compared adjuvants included hydroxy-terminated fluorinated polyether (PF-151N), polyoxyethylene-alpha-fluoro-omega-(2-hydroxyethyl)poly(difluoromethylene) (Zonyl FSN-100), and polyoxyethylene(23) lauryl ether (Brij 35). Greenhouse experiments were performed to evaluate these surfactants both for their efficacy in controlling weeds and selectivity to crops. Tribenuron-methyl and triflusulfuron-methyl absorption into catchweed and giant foxtail leaves due to surfactant addition was also estimated. Zonyl FSN-100 and Brij 35 allowed a reduction in the application rate of triflusulfuron-methyl to nearly 1/2 of the labelled rate to control redroot pigweed. The foramsulfuron rate was reduced by more than 50% to control barnyardgrass thanks to the addition of Zonyl FSN-100 and it controlled giant foxtail only applied at the maximum labelled rate and mixed with Zonyl FSN-100. Tribenuron-methyl activity against poppy was only slightly enhanced by the use of adjuvants. Tribenuron-methyl efficacy was clearly enhanced by the use of adjuvants to control catchweed; however, the required dose was not lower than the labelled one. The addition of adjuvants induced slight phytotoxicity in the crops. Brij 35 caused the greatest absorption of triflusulfuron-methyl into giant foxtail leaves and of tribenuron-methyl into catchweed leaves.

Keywords:
fluorinated surfactants, adjuvants, foramsulfuron, tribenuron-methyl, triflusulfuron-methyl, herbicide activity

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