

HUMECTANTS AS ADJUVANTS WITH GRASS-CONTROL HERBICIDES. Jamie D. Kloster and Calvin G. Messersmith, Graduate Research Fellow and Professor, Department of Plant Sciences, North Dakota State University, Fargo, ND 58105.

Plants under hot, dry conditions prior to and during herbicide application have an increased tolerance to several herbicides when compared to unstressed plants. A humectant is a hygroscopic substance that increases the equilibrium water content of a spray droplet, thus increasing the amount of time it takes a droplet to dry. Research was conducted in the greenhouse and growth chamber to determine the effect of selected humectants on efficacy of clethodim, imazamethabenz, nicosulfuron, and sethoxydim on plants subjected to hot, dry conditions. The humectants evaluated were ammonium nitrate, ethylene glycol, polyethylene glycol (8000), and TCA, each at five rates from 0.125 to 2.0% w/w. Each herbicide plus a methylated seed oil, with and without a humectant, was applied to oat at the three-leaf stage. Ammonium nitrate slightly increased sethoxydim efficacy. Ethylene glycol tended to enhance nicosulfuron efficacy but reduced imazamethabenz and sethoxydim efficacy. Polyethylene glycol tended to increase imazamethabenz efficacy at polyethylene glycol rates less than 1.0% w/w but decreased imazamethabenz efficacy at higher polyethylene glycol rates. Clethodim efficacy was enhanced at polyethylene glycol rates less than 0.5% but was decreased at polyethylene glycol rates greater than 0.5%. Nicosulfuron efficacy increased across all polyethylene glycol rates. TCA tended to reduce imazamethabenz and nicosulfuron efficacy. Polyethylene glycol and TCA in gravimetric watchglass experiments resulted in less water loss than water alone after 12 and 24 h. While reduction in water lost was not different for ammonium nitrate and ethylene glycol compared to water, watchglasses with these treatments visibly retained water for a longer period than water alone.