EFFECT OF TIMING AND ADJUVANTS ON WEED CONTROL WITH PYROXSULAM IN WINTER WHEAT. Gary A. Finn, Monte R. Weimer, Brett M. Oemichen, Harvey A. Yoshida, and D. Chad Cummings, Dow AgroSciences, Indianapolis, IN 46268.

Field research was conducted in multiple locations across the central and western winter wheat belt to determine the effect of application timing on the control of downy brome and true cheat with pyroxsulam versus competitive standards. The impact of ammonium sulfate or urea ammonium nitrate on the efficacy of pyroxsulam on downy brome was also investigated. A total of 12 trials were conducted in 2008 in Kansas, Colorado, Montana, Idaho, Oregon, and Washington. In the application timing study, pyroxsulam (18.4 g ha^{-1}) was compared against propoxycarbazone (44 g ha^{-1}), sulfosulfuron (35 g ha^{-1}), and the premix (Olympus Flex) propoxycarbazone-sodium + mesosulfuron-methyl (25 g ha^{-1}). The four application timings were fall, early winter, late winter/early spring, and normal spring. The five treatments in the adjuvant study were pyroxsulam (18.4 g ha^{-1}) + nonionic surfactant (0.5% v/v), pyroxsulam (18.4 g ha^{-1}) + nonionic surfactant (0.5% v/v) + ammonium sulfate (1.7 kg ha^{-1}), pyroxsulam (18.4 g ha^{-1}) + nonionic surfactant (0.5% v/v) + urea ammonium nitrate (4.68 l ha^{-1}), propoxycarbazone (44 g ha^{-1}) + nonionic surfactant (0.5% v/v), and Olympus Flex (25 gai/ha) + nonionic surfactant (0.5% v/v) + ammonium sulfate (1.7 kg ha^{-1}). In the adjuvant study, applications were made in the fall or in the spring to winter wheat.

In the application timing study, pyroxsulam control of downy brome, when applied in the fall was equal to the competitive standards (>80% control). Applications in the fall provided greater downy brome control versus the spring applications for pyroxsulam, propoxycarbazone, sulfosulfuron, and Olympus Flex. The ranking of the application timings relative to downy brome control were: fall application > normal spring application > winter or early spring (before green-up) applications. Winter dormancy resulted in reduced downy brome control in the winter early spring applications for all the herbicide treatments in the Hays, Kansas and Huntley, Montana locations. Pyroxsulam provided better control of true cheat than downy brome at all application timings. Application timing of pyroxsulam did not affect the control of true cheat, resulting in 95-100% control across all application timings. In the adjuvant study, the addition of ammonium sulfate or urea ammonium nitrate contributed to an increase in downy brome control in adverse growing environments with low moisture and low relative humidity in the Montana, Colorado, and Idaho trials. Pyroxsulam downy brome control was increased 9-14 % in the fall applications and 5-7 % with the spring applications with the addition of ammonium sulfate or urea ammonium nitrate to the spray mixture. The addition of ammonium sulfate or urea ammonium nitrate resulted in little to no effect on downy brome control with pyroxsulam in the Kansas, Washington, and Oregon trial locations. In these locations, growing conditions were more favorable to good plant growth (low moisture stress, actively growing downy brome, and good winter wheat crop competition) resulting in excellent winter wheat growth and good overall weed control. Ammonium sulfate and urea ammonium nitrate were roughly equal in their effect at increasing downy brome control with pyroxsulam with the fall and spring applications. These studies indicate that downy brome control with pyroxsulam is best achieved when applied to actively growing plants < 2 tillers in size. Control of downy brome was reduced when pyroxsulam was applied to winter or drought dormant plants. The results of the adjuvant study support the addition of ammonium sulfate or urea ammonium nitrate to pyroxsulam spray solutions for optimal control of downy brome under adverse growing conditions.

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