

CHEAT AND JAPANESE BROME RESISTANCE TO ALS-INHIBITING HERBICIDES. Dallas E. Peterson* and Curtis R. Thompson, Professors, Department of Agronomy, Kansas State University, Manhattan, KS 66506-5504.

Cheat and Japanese brome are winter annual bromus species that commonly infest winter wheat fields of the southern Great Plains region. Sulfosulfuron and propoxycarbazone herbicides may be applied to wheat for selective control of winter annual bromes in wheat. Several cases of poor *bromus* control with sulfosulfuron and propoxycarbazone were reported in central Kansas during the 2006-2007 growing season. Cheat seed from Dickinson county and Japanese brome seed from Cowley county, Kansas were collected from wheat fields that had been unsuccessfully treated with propoxycarbazone. Greenhouse experiments were conducted to determine if the two *bromus* populations were resistant to ALS inhibiting herbicides. Propoxycarbazone, sulfosulfuron, imazamox, and pyroxsulam were applied at typical field use rates and with recommended adjuvants to susceptible and suspected ALS-resistant cheat and Japanese brome populations at the two leaf stage of growth. Propoxycarbazone also was applied at ten times the labeled field application rate to evaluate the degree of resistance. All herbicides evaluated provided greater than 85% control of susceptible *bromus* populations four weeks after treatment. Control of the suspected resistant *bromus* populations was less than 5% with propoxycarbazone, sulfosulfuron, or pyroxsulam at two and four weeks after treatment, even with the 10X rate of propoxycarbazone, confirming ALS resistance in both *bromus* populations. Imazamox suppressed growth of the resistant cheat and Japanese brome populations by 50 and 35% at four weeks after treatment, but plants were not killed and recovered over time. Both fields with resistant *bromus* populations had received several applications of propoxycarbazone or sulfosulfuron during the previous 10 year period. Isolated populations of cheat and Japanese brome in central Kansas have developed resistance to ALS-inhibiting herbicides labeled for *bromus* control in wheat. Alternative management practices such as crop rotation will be required in wheat fields that have developed ALS-resistant *bromus* populations.