WINTER ANNUAL GRASS CONTROL IN IMIDAZOLINONE RESISTANT WHEAT WITH IMAZAMOX AND COMPETITIVE TREATMENTS. Mark M. Claassen and Dallas E. Peterson, Professors, Department of Agronomy, Kansas State University, Manhattan, KS 66506.

Genetic resistance to imidazolinone in wheat, identified by the Clearfield trade name, is being actively incorporated into varieties grown in the Great Plains. This resistance allows producers to use imazamox herbicide for wide-spectrum weed control in wheat, including that of troublesome grasses such as rye and bromus species. Field experiments were established in the fall of 2002 at Hesston and Manhattan, KS, to evaluate crop safety as well as efficacy of application times and rates of imazamox herbicide and imazamox tank mixes in comparison with sulfosulfuron, MKH 6561 and flucarbazone sodium.

Variety AP502 CL winter wheat was planted with 20-cm row spacing at each location in October. Fall treatments were applied after mid-November. Dormant treatments were sprayed in mid-February or March. Spring treatments were applied in late March. At application times, stage of development of wheat and weeds generally was more advanced at Manhattan than at Hesston. Imazamox was applied alone at rates of 35 and 44 g/ha as well as at 35 g/ha in combination with 21 g/ha chlorsulfuron&metsulfuron or 140 g/ha dicamba. These treatments were compared with 29 g/ha flucarbazone sodium, 45 g/ha MKH 6561, and with 35 g/ha sulfosulfuron alone or in tank mix with 21 g/ha chlorsulfuron&metsulfuron. The effect of herbicides on wheat and weeds were evaluated visually at various times during the growing season. Crop response was further assessed by measurement of grain yield and test weight.

Fall herbicide treatments caused no meaningful injury to Clearfield wheat at Hesston, where late dormant applications of imazamox plus chlorsulfuron&metsulfuron, imazamox plus dicamba, and sulfosulfuron plus chlorsulfuron&metsulfuron caused minor injury in the form of slight stunting and/or chlorosis which dissipated with time. Several imazamox treatments caused minor stunting of wheat at Manhattan, with injury tending to be more severe when applied with methylated seed oil or when tank-mixed with chlorsulfuron&metsulfuron, especially in spring applications.

Cheat control with imazamox was only fair with fall treatments at Hesston, where limited fall cheat emergence and development occurred. There, fall application of imazamox with methylated seed oil or chlorsulfuron&metsulfuron each improved cheat control by 9%. All fall imazamox treatments gave good cheat control at Manhattan. Sulfosulfuron, MKH 6561, and flucarbazone sodium treatments in the fall provided very good to excellent cheat control at both locations. Dormant application of imazamox treatments gave good cheat control at Hesston, but at Manhattan, unless methylated seed oil was used as an adjuvant, resulted in only fair control of cheat. MKH 6561 and flucarbazone sodium in dormant applications were consistently very effective on cheat, while sulfosulfuron provided fair control at Manhattan and excellent control at Hesston. Spring application of imazamox resulted in fair cheat control that was significantly improved by increased rate, tank mix with dicamba, or use of methylated seed oil adjuvant. MKH 6561 and flucarbazone sodium in the spring completely controlled cheat, while sulfosulfuron was somewhat less effective and benefitted from chlorsulfuron&metsulfuron as a tank mix partner.

Downy brome control with imazamox treatments was good with fall, fair to good with dormant, and fair with spring application timings. Addition of methylated seed oil tended to enhance the efficacy of imazamox, while inclusion of dicamba or chlorsulfuron&metsulfuron as a tank mix partner tended to reduce the effectiveness of imazamox on downy brome. All other herbicide treatments gave unsatisfactory downy brome control.

Rye control was good to excellent with imazamox and poor or totally ineffective with all other treatments. Fall imazamox treatments were best with methylated seed oil adjuvant or with the higher application rate, but the addition of chlorsulfuron&metsulfuron or dicamba tended to reduce the level of

rye control. Dormant application of imazamox was effective only with methylated seed oil. Rye control with all spring imazamox treatments was good to excellent.

Wheat yields were enhanced by weed control Manhattan. Most herbicide treatments significantly improved apparent wheat test weight, with average increases of 7.3 and 9.5 lb/bu at the two locations.