EFFECTIVENESS OF MESOTRIONE FOR WEED CONTROL IN GRAIN SORGHUM. Curtis R. Thompson, Mark M. Claassen, Larry D. Maddux, David L. Regehr, Alan J. Schlegel, John C. Frihauf, and Phillip W. Stahlman, Associate Professor, Professor, Professor, Professor, Professor, Research Scientist, and Professor, Kansas State University Southwest Research Extension Center, Garden City, KS, 67846, Kansas State University Harvey County Experiment Field, Hesston, KS 67062, Kansas State University KS River Valley Experiment Field, Topeka, KS 66618, Kansas State University, Agronomy Dept. Manhattan, KS 66506, Kansas State University Southwest Research Extension Center, Tribune, KS 67879, Kansas State University Agric. Research Station, Hays, KS 67601 and Kansas State University Agric. Research Station, Hays, KS 67601.

Weed control in grain sorghum continues to be a challenge because of the limited number of herbicide products available to growers. Field experiments were conducted near Hays, Hesston, Manhattan, Ottawa, and Tribune, KS in 2003 and 2004 to evaluate two prepackaged mixtures, mesotrione&S-metolachlor (1:10 ratio) and mesotrione&S-metolachlor&atrazine (1:10:3.7 ratio) compared to prepackage mixes of S-metolachor&atrazine (1.247:1 or 0.774:1 ratio) for grain sorghum tolerance and weed control. All herbicides were soil surface applied at one (1X) and two (2X) times the field use rates 20 days before planting (20 DBP), 10 days before planting (10 DBP), and preemergence (PRE) immediately following planting. Application rates were mesotrione&S-metolachlor at 2.06 kg/ha, mesotrione&S-metolachlor&atrazine at 2.76 kg/ha, S-metolachlor&atrazine (1.247:1 ratio) at 2.52 kg/ha or (0.774:1 ratio) at 3.24 kg/ha. In 2003, only slight sorghum injury (8% or less) was observed at two locations while no injury was observed at the other three locations. Grain sorghum yields were similar among treatments at three of the five locations while yields were highest with PRE treatments applied at 2X rates at Tribune and Hays. In 2004, no sorghum injury was observed at Hays or Ottawa. Mesotrione&S-metolachlor&atrazine at the 2X rate applied PRE injured sorghum 9% at Tribune. All herbicide treatments injured sorghum at Manhattan enhanced by 12 inches of precipitation following sorghum planting and herbicide applications, however, yields were not different among herbicide treatments or timings. All herbicides treatments at the 2X rate applied PRE injured grain sorghum 11 to 19% and treatments containing mesotrione at the 2X rate reduced grain sorghum yields 8 to 9% at Hesston. Grain sorghum yields were not different among treatments at Ottawa. Averaged over herbicide treatments, grain sorghum yields were 10% lower with PRE than 10 or 20 DBP timings at Hays.

All treatments at one or more locations during 2003 and 2004 controlled green foxtail, large crabgrass, carpetweed, redroot pigweed, Palmer amaranth, tumble pigweed, kochia, and Russian thistle. Puncturevine and common cocklebur were controlled 80% or better with all treatments.

These results indicate that grain sorghum has adequate tolerance to soil applied mesotrione&S-metolachlor and mesotrione&S-metolachlor&atrazine at the 1X rate and that these herbicides could offer effective weed control in grain sorghum. Sorghum injury is possible under certain conditions, however, injury and yield reductions observed from mesotrione mixtures are acceptable compared to yield reductions from heavy weed infestations. At this time, these herbicides are not registered for use in grain sorghum.

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