ROTATIONAL CROP RESPONSE TO FLUCARBAZONE, FLUCARBAZONE PLUS CHLOR-SULFURON, SULFOSULFURON, PROPOXYCARBAZONE, AND PROPOXYCARBAZONE PLUS MESOSULFURON. Dallas E. Peterson and David L. Regehr, Professors, Department of Agronomy, Kansas State University, Manhattan, KS 66506-5504.

Field experiments were conducted near Manhattan, Kansas on a Muir silt loam soil having 6.3 pH, 2.3% organic matter, and a cation exchange capacity of 18 in 2003 through 2005, and on a Reading silt loam soil having 5.8 pH, 3.2% organic matter, and a cation exchange capacity of 10.6 in 2004 through 2005 to evaluate rotational crop response to several herbicides applied to winter wheat for winter annual grass control. 'Overley' hard red winter wheat was planted into a conventional tilled seedbed on October 4, 2003 and October 8, 2004. Herbicide treatments were applied to 2-3 tiller wheat on November 13, 2003 and November 22, 2004. Herbicide treatments consisted of flucarbazone at 30, 60, and 90 g/ha; flucarbazone plus chlorsulfuron at 30 + 16, 60 + 31, and 90 + 47 g/ha; sulfosulfuron at 35 g/ha; propoxycarbazone at 45 g/ha; and propoxycarbazone plus mesosulfuron at 17 + 11 g/ha. The entire plot area was treated with glyphosate in early spring of each year to terminate winter wheat growth. 'Asgrow RX718' corn, 'Pioneer 84G50' grain sorghum, 'Asgrow 3302' sulfonylurea tolerant soybeans, 'Paymaster PM 2145RR' cotton (2004 only), 'Pioneer 63M91' sunflower, and 'Mycogen 8N429CL' (2004) or 'Triumph 650 CL' (2005) imidazolinone resistant sunflower were no-till planted and fertilized according to local recommendations on May 24, 2004 and May 31, 2005. All crops were evaluated for visual injury symptoms throughout the season. Corn, sorghum, soybean, and sunflower crops were harvested for yield at crop maturity. No visible injury symptoms were evident on any rotational crop following flucarbazone, except for minor injury on corn and conventional sunflowers at the highest application rate. Carryover injury and yield loss in corn and conventional sunflowers was severe following flucarbazone plus chlorsulfuron. Carryover injury to cotton and grain sorghum was minor, and primarily only at the higher rates of flucarbazone plus chlorsulfuron. Sulfosulfuron residues caused substantial injury and yield loss in corn, grain sorghum, and conventional sunflowers. Propoxycarbazone caused some injury and minor yield reductions in corn and conventional sunflowers, and minimal injury to grain sorghum. Crop response to propoxycarbazone plus mesosulfuron was generally less than for propoxycarbazone alone. Imidazolinone resistant sunflowers exhibited substantially less injury than conventional sunflowers to all herbicides, but injury was not always eliminated. Cotton and sulfonylurea tolerant soybeans did not exhibit visual injury symptoms or yield loss from carryover of any of the herbicides evaluated. Crop yield loss generally corresponded to visual injury from herbicide carryover, but to a lesser degree than early season ratings. Rotational crops planted 18 months after herbicide application in 2003 exhibited no visible injury symptoms or yield loss.

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