

TOLERANCE OF SEVERAL CROPS TO KIH-485. Rich Zollinger, Kirk A. Howatt, and Brian M. Jenks, Professor and Associate Professor, Department of Plant Sciences, North Dakota State University, Fargo, ND 58105-5051 and Research Scientist, North Central Research Extension Center, Minot, ND 58701-7645.

Replicated field research was conducted in 2004 through 2007 to evaluate crop tolerance of KIH-485 (pyroxasulfone) applied preemergence on wheat, corn, soybean, dry edible bean, field pea, lentil, sunflower, safflower, and flax. Wheat was not visibly injured at rates of 1 to 3.5 oz/A. Cultivated tame oat varieties of 'Beach', 'Dancer', and 'Maida' was completely killed by KIH-485 at 3 and 4 oz/A suggesting the possibility of wild control from KIH-485 applied preemergence in wheat. Over 10 studies were conducted to evaluate corn tolerance to KIH-485 applied at 1 to 6 oz/A. No visible corn injury occurred. KIH-485 was applied preemergence to soybean at 1 to 3.5 oz/A. Only the 3.5 oz/A rate caused soybean injury no greater than 4% and injury was not visible after the first evaluation. All rates of KIH-485 from 1.8 to 6 oz/A injured 'Maverick' pinto, 'Ensign' navy, 'Montcalm' kidney, and 'T-39' black dry beans types. Rates of 1.8 to 3.5 oz/A caused dry bean injury less than 7% at the first evaluation on June 25 but injury increased to 27% by July 27. Significant dry bean injury occurred (17 to 45%) from rates of 4.7 and 6 oz/A which was visible through July 27. Injury increased through time and as KIH-485 rates increased. Dry bean tolerance to KIH-485 is as follows: pinto>navy>kidney=black. Standing water in plots areas from rain in April and June 15 activated the herbicide but also caused dry bean plant death and injury. The studies were abandoned in August due to hail. Dry pea and lentil tolerance to KIH-485 at 2.4 to 4.7 oz/A was excellent in 2006 but dry pea injury was 14 to 37% and lentil was 17 to 33% in 2007. Dry conditions followed application in 2006 and over 13 inches of rain fell in June and July of 2007. Injury increased through time but did not result in yield loss compared to the untreated check. Several trials were conducted in 2004 through 2007 evaluating sunflower tolerance to KIH-485. In eastern North Dakota where soils tend to be more fine with higher organic matter, no significant sunflower injury was observed from KIH-485 at rates of 2.4 to 6 oz/A or with combinations of KIH-485 plus sulfentrazone at 1.5 to 2 oz/A. However, there was 20% sunflower injury from KIH-485 at 6 oz/A on a coarse textured soil at Valley City. At Minot (western North Dakota) where soils are more coarse with lower organic matter, KIH-485 rates up to 3 oz/A in 2006 did not significantly injure sunflower but rates of 4.8 and 6 oz/A caused 17 to 24% injury. There was no difference in sunflower yield from any treated plot compared to the untreated. In 2007 at Minot, no significant injury was observed with any KIH-485 treatment. Safflower had excellent tolerance to KIH-485 in 2006 and 2007 at rates up to 4.7 oz/A. Flax showed 1, 10, and 15% injury to KIH-485 at rates of 2, 3, and 4 oz/A, respectively at one rating 5 weeks after planting. The study was abandoned after the initial rating due to stand loss from standing water. A total of four carryover studies conducted in 2006 and 2007 showed no response of navy and pinto dry bean, flax, and barley from KIH-485 residues at rates up to 6 oz/A. Sugarbeet injury up to 40% and canola injury up to 25% was observed on these crops planted the year following application.