

IS FLUMIOXAZIN SAFE ON SUNFLOWER - REVISITED. Richard K. Zollinger and Brian M. Jenks, Associate Professor and Research Specialist, Department of Plant Sciences, North Dakota State University, Fargo, ND 58105, Phillip W. Stahlman, Kansas State University, Hays, KS 67601, Darrell Deneke, South Dakota State University, Brookings, SD 57007, and Alan Helm, Colorado State University, Holyoak, CO 80523.

Replicated field research was conducted in 2005 at Valley City and Minot, ND, Hays, KS, Brookings, SD, and Holyoak, CO to evaluate sunflower tolerance grown in no-till conditions to flumioxazin applied at 0, 1, 1.5, 2, and 3 oz ai/A. Sulfentrazone was applied at 0.25 lb ai/A. All treatments were applied 3, 2, and 1 week before planting (WBP) and preemergence. Sunflower populations were measured after sunflower establishment by counting all plants in the two center rows of each plot. Soil texture ranged from sandy loam in Valley City to clay loam in Brookings, soil pH from 5.0 in Valley City and Minot to 7.9 in Hays, and organic matter 2.8% in Brookings to 4.7% in Valley City.

Previous research in the west and midwest has shown unacceptable sunflower injury and stand loss to preemergence flumioxazin applied in conventional tillage but flumioxazin applied early preplant in no-till sunflower has not been fully studied. Limited supplies of sulfentrazone in 2005 created interest in flumioxazin use in sunflower. Flumioxazin label allows many crops, including sunflower to be planted 30 days after application. Flumioxazin rate of a rate of 1.5 oz/A is considered the optimum rate for residual weed control in no-till conditions.

Sunflower does not have tolerance to flumioxazin. Flumioxazin reduced sunflower population at all rates and all application timings but sunflower showed the most tolerance at Hays. Reduction in sunflower population was greatest at Minot (24 to 89%), followed by Valley City (20 to 83%), Brookings (7 to 37%), and Hays (0 to 29%). Flumioxazin applied at 1.5 oz/A 3 WBP, the preferred rate and timing for use in no-till caused greater than 53% sunflower stand loss at Valley City and Minot, and 0% in Brookings and Hays. At Brookings, treatments were applied earlier than 3 WBP. Sunflower populations at 4 and 5 WBP were 0% and 12% at the 1.5 oz/A rate and 15% and 33% at the 3 oz/A rate. At Hays, sunflower stands were reduced by flumioxazin at 1.5 oz/A at all application timings from 0% to 12% but sunflower yield was reduced up to 23%. Sulfentrazone applied at all locations at the highest labeled rate of 0.25 lb/A caused less than a 5% reduction in sunflower stand and did not reduce sunflower yields at all locations. The entire study at Holyoak unintentionally received an additional application of 0.125 lb/A of sulfentrazone at 1WBP but no stand reductions were observed (data not included). This data supports previous research that showed sunflower tolerance to flumioxazin was greatest when applied in no-till conditions. Sunflower tolerance is greater in CO, but less in the plains region, and least in the northern plains.