

DRY BEAN RESPONSE TO FLUMIOXAZIN AND SULFENTRAZONE. Karen A. Renner and Gary E. Powell, Professor and Research Technician, Michigan State University, East Lansing, MI 48824.

Growers have few options for controlling eastern black nightshade (*Solanum ptycanthum* Dun.) and other broadleaf weeds that infest Michigan dry bean acres. Imazethapyr and imazamox control redroot pigweed (*Amaranthus retroflexus* L.) and eastern black nightshade and are registered for use in dry beans. However crop rotation to sugarbeets and cucumbers limits use of these herbicides the year prior to planting sugarbeets. Flumioxazin and sulfentrazone are registered for use in soybeans and provide good control of common lambsquarters (*Chenopodium album* L.), redroot pigweed, and eastern black nightshade. Therefore research was initiated in 2001 and repeated in 2002 to determine navy and black bean tolerance to preemergence applications of flumioxazin and sulfentrazone in Michigan. Flumioxazin at 54 g a.i./ha (2002 only), 70 g/ha, and 108 g/ha (2001 only) and sulfentrazone at 105 and 142 g a.i./ha were applied preemergence immediately after planting at the Saginaw and East Lansing sites in 2001 and 2002. 'Vista' navy bean was planted at the Saginaw site on June 13, 2001 and June 18, 2002. 'Jaguar' black bean was planted at the East Lansing site on June 11, 2001 and June 17, 2002. The soil type at Saginaw in 2001 was a silty clay with 3.1% organic matter and a soil pH of 7.8. In 2002, the soil type at Saginaw was a clay with 2.9% organic matter and a soil pH of 7.8. The soil type at East Lansing in 2001 was a sandy clay loam with 2.3% organic matter and a soil pH of 7.1. The soil type in 2002 at East Lansing was a clay loam with 3.4% organic matter and a soil pH of 6.9. Navy and black bean injury was evaluated 10 and 21 days after planting, and dry bean populations were counted 21 days after planting. Dry bean maturity was assessed in early September by comparing leaf yellowing in the weed-free control to leaf yellowing in the herbicide treatments. Dry beans were harvested for yield in late September; however yields are not reported here because plots were not maintained weed-free throughout the growing season.

Injury to navy and black beans from flumioxazin and sulfentrazone was dependent on rainfall in the 14 days following planting. In 2001 at East Lansing, 5.6 cm of rain fell in the 14 days after planting, and 3.1 cm of rain fell during that time period at Saginaw. In 2002, less than 0.2 cm of rain fell at East Lansing in the 14 days after planting, while 2.8 cm of rain fell at the Saginaw site. Flumioxazin did not injure navy beans in 2001 at the Saginaw site. However, sulfentrazone at 105 g/ha injured 'Vista' navy bean at the Saginaw site in both years and 'Jaguar' black bean at East Lansing in 2001. Navy and black bean populations were reduced by sulfentrazone in 1 of 2 years. Navy bean maturity was delayed in both years, while black bean maturity was not delayed. Flumioxazin at 54 g/ha injured 'Vista' navy bean at the Saginaw site in 2002 and reduced navy bean populations by 30%. Flumioxazin at 70 g/ha injured 'Jaguar' black bean and reduced bean populations by 40% at the East Lansing site in 2001. Navy and black bean maturity was not delayed. Injury to these two dry bean classes from flumioxazin and sulfentrazone would not be acceptable to dry bean growers.