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Leafy spurge control and soil residues with sulfometuron

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Sulfometuron, a sulfonylurea herbicide, has shown potential in controlling leafy spurge. Sulfometuron could provide cost efficient and effective control of leafy spurge compared to herbicides presently used.

Experiments were established to evaluate sulfometuron alone and in combination with auxin herbicides for leafy spurge control. The experiments were conducted on ungrazed dense stands of leafy spurge at sites near Dickinson and Chaffee, North Dakota. Spring and fall applications were compared in the first experiment. Sulfometuron alone and in combination with 2,4-D, dicamba or picloram were applied in June and September 1986. Sulfometuron and auxin herbicides were spring applied at comparatively low rates to leafy spurge in the second experiment. The plots for both experiments were 10 × 30 ft and each treatment was replicated four times in a randomized complete block design.

Sulfometuron spring applied at 1 and 2 oz/A provided 3 and 13% leafy spurge control, respectively, in August 1986 when averaged across the Dickinson and Chaffee locations. Sulfometuron at 1 oz/A applied with picloram at 8 oz/A, dicamba at 32 oz/A or 2,4-D at 16 oz/A gave 82, 27 and 57% control, respectively. Leafy spurge control was less than 34% for all spring applied treatments when evaluated 12 months after application. Sulfometuron alone or with 2,4-D, dicamba or picloram applied at similar rates in the fall provided 17, 65, 84, 61 and 37% control, respectively, in June 1987. Fall treatments of sulfometuron and sulfometuron plus auxin herbicides caused grass injury at both locations. Grass injury ranged from 25 to 65% with the most injury from sulfometuron at 2 oz/A. Sulfometuron applied at 0.5 oz/A with picloram at 4 or 2 oz/A, dicamba at 16 or 8 oz/A or 2,4-D at 8 or 4 oz/A did not provide adequate control of leafy spurge 12 months after application.

An experiment to evaluate the effect of sulfometuron and sulfometuron plus auxin herbicides on forage production and species composition of native grasses was established at sites near Manning and Fargo. Spring applied treatments did not decrease warm or cool-season grass production.

Sulfometuron will be used on many different soils and under various conditions if proven to be effective in controlling leafy spurge. An experiment to determine soil mobility of sulfometuron was conducted in the greenhouse. Soil was collected near leafy spurge treatment sites at Chaffee, Dickinson and Valley City. Sulfometuron at 2 oz/A

was leached through hand packed soil in a 26 inch column by a volume of water corresponding to an annual rainfall of 18 inches. Treatments were replicated four times for each soil type.

Sulfometuron movement was greatest when water was applied continuously for 48 h. Sulfometuron was leached the entire length of the 26 inch soil column for all three soil types. Movement of sulfometuron was less when water was applied in 2 inch increments over 9 weeks. Sulfometuron was detected in Dickinson, Valley City and Chaffee soil at maximum depths of 12, 8 and 16 inches, respectively.

An experiment to determine the surface movement of sulfometuron applied to a sloped area was established at sites near Valley City and Dickinson. Natural slopes of 0-2%, 6-8% and 14-16% were treated with sulfometuron at 2 oz/A in July 1986. The plots were 10 × 30 ft and each treatment was replicated three times in a completely random design. Soil samples were collected downslope from the treated area in August 1986 at depths of 0 to 6 and 6 to 12 inches. A corn root bioassay was conducted to estimate sulfometuron residue.

Movement of sulfometuron from the treated area was minimal on the 0-2% and 6-8% slopes at both locations. The highest concentration of sulfometuron detected downslope from the treated area was 0.4 ppb. Movement of sulfometuron was greatest on the 14-16% slope at Dickinson. However, the highest concentration detected was still less than 1 ppb.