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The effect of sulfometuron and 2,4-D combinations on leafy spurge

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It has been suggested that 2,4-D {(2,4-dichlorophenoxy) acetic acid} in combination with sulfometuron {2-[[[(4,6-dimethyl-2-pyrimidinyl) amino] carbonyl] amino] sulfonyl] benzoic acid} may produce a synergistic response when applied to leafy spurge (*Euphorbia esula* L.) (1,2). It was demonstrated that postemergence field application of sulfometuron + 2,4-D at 1 oz/A and 1 lb/A, respectively, severely inhibited root bud growth (1).

This reported study was initiated to evaluate, under greenhouse conditions, the response of leafy spurge treated with a variety of concentration combinations of 2,4-D and sulfometuron.

Individual leafy spurge plants were grown in large PVC pipes, 4" diameter and 39" long. Plants had been transplanted by root cuttings two years prior to the experiment and had, therefore, developed an extensive root system extending to the base of the pipe. Each spurge plant was cut to 1" above surface of soil five weeks prior to treatment. Herbicide treatments included every possible combination of five rates of both 2,4-D and sulfometuron: 2,4-D - 0, 0.125, 0.25, 0.5, and 1.0 lb/A ai; sulfometuron - 0, 0.25, 0.5, 1.0 and 2.0 oz/A ai. Treatments were applied with a backpack sprayer (5 reps/ treatment). The plants were subsequently placed in a greenhouse with 16h light and at a temperature range of 20 to 30°C. Treatments were evaluated twice a week for four weeks. After four weeks the plants were cut to 1 inch above the soil surface and again evaluated weekly for regrowth and injury.

Results after four weeks of treatment indicate nearly complete control of leafy spurge at 0.5 and 1.0 lb/A 2,4-D regardless of the concentration of sulfometuron. In each case the symptoms observed were those classically associated with phenoxy herbicides. All treatments of sulfometuron alone had no effect on leafy spurge growth.

The Colby method (3) of evaluating herbicide combinations indicated that no clear synergistic response existed between 2,4-D and sulfometuron in leafy spurge. Injury symptoms apparently depend only on the concentration of 2,4-D.

After six weeks of regrowth (10 weeks after treatment), 2,4-D and sulfometuron combinations demonstrated the opposite effect. Although no treatment inhibited the number of new shoots or their initiation, dramatic differences in both shoot height (82% reduction at 2.0 oz/A) and the appearance of symptoms were observed. The reduction in

shoot growth, however, correspond to sulfometuron concentrations and not to the concentrations of 2,4-D. In addition, chlorosis, thin leaves, and stunting were associated with sulfometuron treatments, but not with 2,4-D alone.

Results of this study suggest that sulfometuron and 2,4-D combinations in leafy spurge do not produce a synergistic response in either treated shoots or new shoots initiated after treated shoots were removed. However, soil applied sulfometuron may elicit an entirely different response, as the herbicide would be available for root absorption over a longer period of time.

Literature cited

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