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Leafy spurge response to rate and time of application of imidazolinone herbicides

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Field experiments were conducted to determine the response of leafy spurge and associated vegetation to imazapyr, imazethapyr, and imazaquin applied at rates of 0.07, 0.14, and 0.28 kg a.i./ha in early June and September 1989. Experiments were conducted on a subirrigated meadow range site near Ainsworth, Nebraska. A visual estimate of leafy spurge control and leafy spurge and grass dry matter yields were determined in July 1990 to assess herbicide efficacy. Herbicides applied in the fall provided better control of leafy spurge than those applied in the spring. Averaged across herbicides, the fall application of 0.28 kg/ha provided 85% control of leafy spurge by late June 1990. Ten months after the fall application, leafy spurge yield was reduced to 338 kg/ha on areas treated with 0.28 kg/ha as compared to 2144 kg/ha harvested from areas not treated with herbicide. Grass yields in June 1990 were unaffected by treatment with imazethapyr and imazaquin, regardless of rate or time of application. In contrast, grass yields were reduced 54 and 71% 10 months after fall application of imazapyr at rates of 0.14 and 0.28 kg/ha, respectively. Spring applied herbicides had a negligible effect on leafy spurge. The lack of control by treatments in the spring resulted in part from severe drought conditions throughout the 1989 growing season. There was a 309 mm precipitation deficit in 1989, which was 56% below the long-term average. Despite adverse growing conditions, herbicides applied at a rate of 0.28 kg/ha in the fall of 1989 provided good control of leafy spurge through the summer of 1990.