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Effects of combined herbicides and various seeded grass species on leafy spurge

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Single herbicide applications do not provide long-term leafy spurge control. This study was conducted near Sundance, WY to determine long-term effects provided by combinations of herbicides and grass species competition. Before seeding perennial grasses, two applications of glyphosate at 0.75 lb ai/A were broadcast applied with a truck-mounted sprayer delivering 15 gpa at 35 psi on June 2, 1986, temperature: air 69°F, soil surface 65°F, 1 inch 64°F, 4 inches 63°F with 58% relative humidity and calm wind. A post-emergence broadcast application of pentimethalin at 2.0 and 0.5 ai/A were applied May 16, 1988, temperature: air 73°F, 1 inch 68°F, 2 inches 67°F, 4 inches 64°F with 64% relative humidity and wind 2 to 3 mph NW, with a tractor-mounted sprayer applying 20 gpa at 35 psi. Plots were arranged as a split plot, 60 by 9 feet, with four replications, one-half of the plot tilled, the other half left untilled. Tilling was done with a roto-tiller on August 11, 1986, and grasses were seeded into a silt loam soil (22% sand, 58% silt, 20% clay with 1.8% organic matter and a 6.3 pH) with a powertill drill August 12, 1986.

All herbicide treatments combined with tillage treatments resulted in greater grass establishment with greater production per acre than the untilled areas (Table 1). Pubescent wheatgrass and big bluegrass were the only two grasses to establish adequately on areas without tillage. Mountain rye and bluebunch wheatgrass were the only two grasses failing to establish adequately in tilled areas. Leafy spurge control levels above 88% in no-tilled areas were found in plots seeded with pubescent wheatgrass and big bluegrass. Leafy spurge control was less than 83% in tilled areas seeded to mountain rye and bluebunch wheatgrass, the other nine grasses had control greater than 91%.

Table 1. Control of leafy spurge using glyphosate, competition from various grass species and two tillage practices.

Grass Species (Variety)	% Grass established Tilled	% Grass established No-tilled	% Leafy spurge control Tilled	% Leafy spurge control No-tilled	Lbs. grass (D.M./ Acre)	Lbs. grass (D.M./ Acre) No-tilled
Pubescent wheatgrass (Luna) ³	90 ⁴	70	97	84	572	274
Crested wheatgrass (Ephraim)	83	55	95	79	474	218
Mountain Rye	18	05	79	58	368	224
Big bluegrass (Sherman)	74	79	96	89	594	336
Hybrid wheatgrass (RS1)	74	13	94	60	518	142
Smooth bromegrass (Lincoln)	80	18	92	68	294	152
Intermediate wheatgrass (Oahe)	71	16	97	68	652	152
Bluebunch wheatgrass (Secar)	64	15	83	64	194	128
Western wheatgrass (Rosana)	76	26	91	65	464	174
Russian wildrye (Bozoisky)	83	30	97	63	552	160
Thickspike wheatgrass (Critana)	81	29	.94	70	484	210

¹Research/demonstration conducted by: T. D. Whitson, U. W. Extension Weed Specialist, D. W. Koch, U. W. Extension Agronomist and A. E. Gade, U. W. Crook Co. Agricultural Agent, M. E. Ferrell, U. W. Extension Pesticide Specialist.

²Study location: U. W. leafy spurge research area, Crook Co., WY.

³Grasses were seeded August 12, 1986.

⁴Evaluated September 14, 1988.