Reprinted with permission from: Proceedings and Progress Reports of the Leafy Spurge Symposium. Gillette, WY. July 10-12, 1990. pp. 26-27.

Published by: Great Plains Agricultural Council: Leafy Spurge Symposium.

The control of leafy spurge (*Euphorbia esula* L.) by the integration of herbicides and perennial grasses

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Plant competition has long been recognized as an important method for control of weeds. This experiment was established near Sundance, WY, to determine the effects of establishing eleven perennial grass species on control of leafy spurge. Before seeding perennial grasses, two applications of glyphosate at 0.75 lb ai/A were broadcast with a truck-mounted sprayer delivering 15 gpa at 35 psi on June 2, 1986 (temperature: air 69º F, soil surface 65º F, 1 inch 64º F, 2 inches 63º F, 4 inches 63º F with 58% relative humidity and calm winds) and on July 1, 1986 (temperature: air 85º F, soil surface, 85º F, 1 inch 84º F, 2 inches 81º F and 4 inches 80º F with 40% relative humidity and 2 to 3 mph west winds). Soils were classified as a silt loam (22% sand, 58% silt and 20% clay) with 1.8% organic matter and 6.3 pH. A postemergent broadcast application of pendimethalin at 2.0 and fluroxypyr at 0.5 lb ai/A was applied May 16, 1988 (temperature: air 73º F, 1 inch 68º F, 2 inches 67º F, 4 inches 64º F with 64% relative humidity and wind 2 to 3 mph NW) with a tractor-mounted sprayer applying 20 gpa at 35 psi. Plots (60 by 90 feet) were arranged in a split plot design with four replications, one half the plot tilled, the other half left untilled. Tillage was performed with a rototiller on August 11, 1986 and grasses were seeded with a John Deere powertill drill on August 12, 1986. Evaluations were made September 14, 1988 and Aug. 8, 1989. In areas established with no tillage before seeding, pubescent wheatgrass and big bluegrass provided 72 and 78% control of leafy spurge and were 71 and 83% established with yields of 1,062 and 2,118 lb. dry matter (D.M.) per acre, respectively, while in treatment areas with tillage before seeding, western wheatgrass, hybrid wheatgrass, crested wheatgrass, big bluegrass, intermediate wheatgrass, pubescent wheatgrass and Russian wildrye provided 88, 89, 90, 91, 91, 93, and 93% control of leafy spurge, and were 58, 85, 86, 88, 91, 90, and 90% established with yields of 1,348, 2,886, 1,434, 2,997, 3,173, 2,074, and 1,283 lb. D.M./Acre, respectively. Yields were especially high due to considerably greater than normal rainfall at the study site in May and June.

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Grass Species (Variety)[1]	Grass Establishment[2]				% Leafy Spurge Control				Lb. Grass (D.M./Acre)			
	Tilled		No-Tilled		Tilled		No-Tilled		Tilled		No-Tilled	
	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989
Pubescent wheatgrass (Luna)	90	90	70	71	97	93	84	72	572	2,074	274	1,062
Crested wheatgrass (Ephraim)	83	86	55	14	95	90	79	56	474	1,434	218	413
Mountain Rye	18	11	5	4	79	50	58	31	368	436	224	119
Big bluegrass (Sherman)	74	88	79	83	96	91	89	78	594	2,997	336	2,118
Hybrid wheatgrass (RSl)	74	85	13	10	94	89	60	33	518	2,886	142	619
Smooth Bromegrass (Manchar)	80	80	18	23	92	79	68	40	294	1,263	152	605
Intermediate wheatgrass (Oahe)	71	91	16	53	97	91	68	51	652	3,173	152	2053
Bluebunch wheatgrass (Secar)	64	64	15	2	83	76	64	35	194	968	128	169
Western wheatgrass (Rosana)	76	58	26	19	91	88	65	48	464	1,348	174	387
Russian wildrye (Bozoisky)	83	90	30	10	97	93	63	44	552	1,283	160	220
Thickspike wheatgrass (Critana)	81	61	29	15	94	78	70	29	484	1,587	210	690

[1]Grasses seeded August 12, 1986.
[2] Evaluations made September 14, 1988 and August 8, 1989.