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Controlling leafy spurge in Minnesota with competitive species and combined management practices

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The present study was performed to evaluate the interfering ability of several perennial grasses with an integration of additional weed management tools to decrease leafy spurge populations. Two field experiments (Plot A and Plot BC) were started in June of 1991 at the Minnesota Valley National Wildlife Refuge in Shakopee, MN. Set-up treatments were disking of Plot A and an application of glyphosate (4 lb/acre) followed 7 days later by disking of Plot BC. Plot A was used as one experiment consisting of three repetitions of eight grass treatments. The treatments were (1) 'Bozoisky' Russian wildrye (*Psathyrostachys juncea*); (2) 'Hakari' mountain brome (*Bromus sitchensis*); (3) a mixture of 'Luna' pubescent wheatgrass (*Agropyron intermedium* var. *trichophorum*), 'Ephraim' crested wheatgrass (*Agropyron cristatum*), and 'Arriba' western wheatgrass (*Agropyron smithii*); (4) a mixture of 'Hakari' mountain brome, 'Tiki' smooth brome (*Bromus inermis*), and 'Matua' brome; (5) a mixture of short native prairie grasses, side-oats grama (*Bouteloua curtipendula*), buffalograss (*Buchloe dactyloides*), and little bluestem (*Schizachyrium scoparium*); (6) a mixture of little bluestem and side-oats grama; (7) little bluestem; and (8) control - no species seeded. Plot BC was used as one experiment consisting of three repetitions of eleven grass treatments. The treatments included: (1) a mixture of big bluestem (*Andropogon gerardii*) and little bluestem; (2) a mixture of switchgrass (*Panicum virgatum*) and side-oats grama; (3) a mixture of short native prairie grasses - side-oats grama, buffalograss, and little bluestem; (4) a mixture of tall native prairie grasses - big bluestem, switchgrass, and indiangrass (*Sorghastrum nutans*); (5) 'Ramsey' alfalfa (*Medicago sativa*); (6) a mixture of 'Luna' pubescent wheatgrass, 'Ephraim' crested wheatgrass, and 'Arriba' western wheatgrass; (7) a mixture of 'Hakari' mountain brome, 'Tiki' smooth brome, and 'Matua' brome; (8) 'Bozoisky' Russian wildrye; (9) 'Luna' pubescent wheatgrass; (10) buffalograss; (11) control - no species seeded. The grasses were seeded at 100 PLS lb/acre into 1 m by 18 m rows.

In the second year of the study, several management techniques were used to promote grass establishment and reduce leafy spurge. A burn was conducted on May 19, 1992 on Plot A and Plot BC. Herbicides were applied in 4.75 m wide blocks in Plot A and in 4.5 m wide blocks in Plot BC across all species treatments rows. The herbicide treatments

included: (1) picloram at 1 lb/acre applied on June 25, 1992; (2) picloram + 2,4-D at 0.25 + 1 lb/acre applied on June 25, 1992; (3) imazethapyr at 0.25 lb/acre applied on October 5, 1992; and (4) control - left untreated.

Herbicides were applied using a backpack sprayer. Both Plot A and Plot BC were mowed to a height of 6-8 inches in July 31, 1992 and fertilized with (10-20-16) on October 5, 1992. The percent cover of leafy spurge was monitored throughout each growing season. In Plot A, all three grass treatments containing little bluestem established well and were best at reducing leafy spurge cover.