

THE INTEGRATION OF MULTIPLE BIOLOGICAL CONTROL  
AGENTS FOR THE CONTROL OF LEAFY SPURGE

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## ABSTRACT

Perlinski, Anthony Thomas, M.S., Program of Natural Resources Management, Department of Animal and Range Sciences, College of Graduate and Interdisciplinary Studies, North Dakota State University, November 2007. The Integration of Multiple Biological Control Agents for the Control of Leafy Spurge. Major Professor: Dr. William T. Barker.

This study was conducted to evaluate the effectiveness of introducing multiple biological control agents into a multi-species grazing system to increase control of leafy spurge in southeastern North Dakota. This study was conducted on the Albert Ekre Grassland Preserve (AEGP) near Kindred, ND. Treatments were applied in a completely randomized design with eight treatments randomly assigned to sixteen blocks. Treatments were 1) *Aphthona* spp. alone, 2) *Aphthona* spp. with grazing, 3) *Oberea erythrocephala* alone, 4) *O. erythrocephala* with grazing, 5) *Aphthona* spp. with *O. erythrocephala*, 6) *Aphthona* spp. with *O. erythrocephala* and grazing, 7) grazing alone, and 8) no treatment. During the first season, each site receiving *Aphthona* species included a mixture of *Aphthona lacertosa*, *A. cwzolinea*, and *A. flava* at approximately 500 adult beetles. Those sites treated with *Oberea erythrocephala* received 75 adult beetles. Prior to the second season releases, four sweep transects were conducted on each release site, and the number of adult beetles per transect were counted. The results of these transects showed positive establishment of all released species on all release sites. During the second season, *Aphthona* releases consisted of 1000 adult beetles and *Oberea erythrocephala* releases containing 100 adult beetles. The grazing system consists of a 259-hectare unit divided into 4 equally sized pastures grazed with 90 cow-calf pairs and 160 ewes using a twice-over rotation grazing system. There was no difference ( $P < 0.05$ ) in above-ground production of leafy spurge between treatments. Similarly, no difference ( $P < 0.05$ )

occurred between the basal cover of leafy spurge, grasses, or forbs between years. The most significant result of this study was the establishment of two biological control agents, *Oberea erythrocephala* and *Apthona* spp., on the AEGP regardless of whether the release sites were grazed or ungrazed.