

ASSESSING THE IMPACTS OF BIOLOGICAL CONTROL ON SPOTTED KNAPWEED, *CENTAUREA BIEBERSTEINII* D.C., IN MINNESOTA. Natasha M. Northrop and Anthony B. Cortilet, Research Scientists, Minnesota Department of Agriculture, St. Paul, MN 55155.

Spotted knapweed is an exotic terrestrial plant of Eurasian origin that threatens Minnesota's roadside, rangeland, agricultural, and grassland/prairie ecosystems. Minnesota land owners/managers are searching for less expensive and more environmentally compatible alternatives to herbicide use for management and control of this weed. The United States Department of Agriculture (USDA) released eleven biological control agent species in the state from years 1989 through 2000. Prior to the Minnesota Department of Agriculture (MDA) inheriting the program in 2000, few attempts had been made to assess the establishment and success of agents throughout the state to determine if biological control was a viable pest management strategy for spotted knapweed. This research grant was developed in an attempt to increase our knowledge of spotted knapweed biological control in Minnesota and to evaluate the impacts that bioagents have on this highly invasive weed. Results determined that six of the eleven bioagents released in Minnesota, *Urophora affinis*, *Urophora quadrifasciata*, *Larinus minutus*, *Larinus obtusus*, *Cyphocleonus achates*, and *Agapeta zoegana*, are established, have impacted the growth and spread of spotted knapweed on several sites, and are collectable for redistribution to new infestations in the state. Rigorous sampling of selected biological control sites has provided the MDA with important information pertaining to the extent of spotted knapweed infestations, composition of other vegetation, and various landscape, soil, and geographical parameters characterizing infestation sites in Minnesota. It is not the only option, but biological control can be an important tool for spotted knapweed management in Minnesota. It has the potential to have long-term and sustainable impacts on large infestations where herbicides and other IPM tactics are not practical, are too expensive, or are ecologically unsound. Through this LCMR (Legislative Commission on Minnesota Resources) grant, the MDA has dramatically increased its knowledge of spotted knapweed in the state and the possibilities for extensive biological control management in the future.