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Host Damage by *Pterolonche inspersa* (Lepidoptera: Pterolonchidae) and *Bangasternus fausti* (Coleoptera: Curculionidae) on Diffuse Knapweed (*Centaurea diffusa*)

P. Dunn and G. Campobasso

U.S. Department of Agriculture, Agricultural Research Service, Rome Italy

Abstract

Diffuse knapweed (*Centaurea diffusa*; Compositae) is a weed of European origin which presently infests *ca.* 3 million acres in northwestern United States and western Canada. Since 1961, biological control has been investigated to reduce the population density of diffuse knapweed. To date, two flies, *Urophora affinis* and *U. quadrifasciata* (Diptera: Tephritidae) whose larvae produce galls in the seed head receptacle, and the root-boring beetle *Sphenoptera jugoslavica* (Coleoptera: Buprestidae), have been introduced in Canada and the United States. In 1973, the moth *Metzneria paucipunctella* (Lepidoptera: Gelechiidae), whose larvae feed and develop on the seed head receptacle of *Centaurea maculosa*, was released in Canada. Although these insects became established, additional biological control agents were necessary to reduce knapweed to a sub-economical level. Since 1980, two insect species, *Pterolonche inspersa* (Lepidoptera: Pterolonchidae) and *Bangasternus fausti* (Coleoptera: Curculionidae), have been studied as candidates for the biological control of diffuse knapweed. *P. inspersa* is univoltine, with adult emergence in July and August. Females lay eggs on rosette leaves, with a slight preference for the lower leaf surface. The larvae feed either in the root core or beneath the root cortex through the fall, overwinter within the root, and pupate the following year. Larval feeding causes loss of woody root texture, reduction in aerial biomass, and reduction in plant height. Of 60 plant species tested in host-specificity tests, *P. inspersa* completed development only on *C. diffusa* and *C. maculata*. Releases of *P. inspersa* were made in the United States in 1987. *B. fausti* adults emerge in May, and feed on knapweed leaves. Females lay eggs on flower heads or on the stem near the receptacle. Larvae enter the flower head, where they complete development. In consuming contents of attacked seedheads, larvae reduce significantly the seed production of diffuse knapweed. Pupation occurs in the receptacle and new adults overwinter in soil at bases of host plants. Host-specificity testing demonstrated that *B. fausti* is restricted to *Centaurea* spp. Petition for introduction into quarantine in the U.S. was submitted in 1987.