Hybrid Weeds! Agent Biotypes!: Montana’s Ever-Evolving Toadflax Biological Control Soap Opera

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Abstract

An exotic toadflax stem mining weevil conventionally identified as Mecinus janthinus Germar has become widely established on Dalmatian toadflax [Linaria dalmatica (Linnaeus) Miller] in western North America, although agent density and control efficacy are highly variable across release sites (De Clerck-Floate & Miller, 2002; McClay & Hughes, 2007; Van Hezewijk et al., 2010). Naturally-occurring and fertile hybrid toadflax (HT) populations resulting from the cross-pollination of Dalmatian toadflax (DT) and a sister species, yellow toadflax (Linaria vulgaris Miller) (YT), have been discovered in Montana (Ward et al., 2009). Genetically distinct, host-specific Mecinus species have been confirmed from native range populations (Toševski et al., 2011). In Montana, the DT-associated M. janthiniformis Toševski & Caldara sp.n. appears to be abundant and widespread, while the YT-associated weevil confirmed to be Mecinus janthinus Germar, 1821 appears to occur much less frequently (Toševski, pers. comm.). Naturally-occurring hybridization of DT and YT coupled with the discovery that the host associated Mecinus biotypes were in fact separate species has at the very least increased the complexity of toadflax biocontrol. Strategic implementation of biological control for forests and rangelands affected by widespread, trenchant infestations of both toadflax species in particular seems less straightforward. Our research results seek to address a range of questions regarding the optimal deployment of the two recently confirmed and host specific Mecinus species, and strategies for effective biological control of hybrid toadflax.
References


