

Preliminary Success in Biological Control of Saltcedar – Texas/New Mexico
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ABSTRACT

Biological control has successfully controlled 13 exotic, invasive weeds of rangelands and natural ecosystems in the United States since 1945, control of others is in progress, and many more have been controlled worldwide. We initiated biological control of saltcedars (*Tamarix* spp.) at Temple, TX in 1986, using host-specific insect herbivores that regulate saltcedar populations in the Old World. Our cooperators in France, Israel, Kazakhstan, China and Turkmenistan tested 20 candidate control insects. Then, after quarantine testing at Temple, and being joined by the new ARS-EIWR Unit at Albany, CA (led by Carruthers) we released the leaf beetle, *Diorhabda* sp. (Coleoptera: Chrysomelidae) from Fukang, China and Chilik, Kazakhstan, into the open environment at 10 sites in May 2001. They established at 5 of the 6 northern sites and by August 2006 had defoliated approximately 85,000 acres at Lovelock, NV, 30,000A at Schurz, NV and Delta, UT, 8,000A at Lovell, WY and 300A at Pueblo, CO (discussed by others at this symposium).

These northern beetles failed to overwinter or to establish in Texas and southern California because the short summer daylengths cause premature overwintering diapause. In 2002, our overseas cooperators sent *Diorhabda* ecotypes from 4 more southern latitudes. In tests at Temple and Albany, these beetles severely attacked the most widespread and damaging saltcedars, attacked other *Tamarix* spp. less, and were safe for all other 60 plant species tested. We released the Crete/Posidi, Greece ecotype into field cages and then into the open environment at 9 sites in Texas, 3 in New Mexico, and 2 in California from 2003 to 2005. We now have overwintering, establishment and rapid increase at Big Spring, and Lake Merideth, TX

and probably also near Artesia, NM. At Big Spring, we released 38 adult Crete beetles in late April 2004 which defoliated 2 small trees by July; we added another 500 beetles in July which together with those defoliated another large tree by late September. In 2005, these increased rapidly and defoliated an area of 1.6A (210 large and medium-sized trees) by mid September. By late August 2006, they had defoliated an area of 10A. We have redistributed these beetles to several sites in the Big Spring/Sweetwater area and at Ft. Stockton, TX during 2005-6 and studied best methods for release. In uncaged, open field tests in southern Texas near Kingsville and Encino, and at Big Spring and Ft. Stockton, we are comparing the effects of the Crete and Tunisia beetles on saltcedar vs. the exotic athel (*Tamarix aphylla*) trees in preparation for consultations with Mexico regarding releases along the Rio Grande. Athel has some beneficial values for shade trees and windbreaks in the southern U.S. and northern Mexico. At Lake Merideth, TX we released the Posidi, Greece and Uzbek ecotypes in 2005 which now are established, dispersing and defoliating saltcedar. Near Artesia, NM, we released the Crete ecotype in August 2003 but they failed to establish after initially overwintering and defoliating saltcedar. A release of the Fukang ecotype in field cages near Artesia in May 2005 continued to reproduce into October, overwintered well, and were released into the field in May 2006. These field populations have significantly increased, probably representing an adaptation to more southern areas with shorter daylength. Intensive monitoring is underway. Where established, these beetles are providing self-sustained, permanent, environmentally friendly, and low cost control of saltcedars that is safe to all native plant species. We expect this to allow recovery of native riparian plant communities where water tables and soil salinity are satisfactory, and to improve wildlife and fish habitat, reduce wildfires, increase availability of water, and increase recreational usage of parks and natural areas.