

Effects of host condition and genotype on performance of *Diorhabda elongata* (Chrysomelidae). Tom Dudley<sup>1,2</sup> (tdudley@msi.ucsb.edu), Peter Dalin<sup>1</sup> (dalin@msi.ucsb.edu), Robert Pattison<sup>3</sup> (rpattiso1@hotmail.com), Dan W. Bean<sup>4</sup> (dan.bean@ag.state.co.us), Andrea Caires<sup>5</sup> (threepin10@yahoo.com).

<sup>1</sup>Univ. of Calif., Santa Barbara; <sup>2</sup>Univ. of Nevada, Reno; <sup>3</sup>USDA-ARS, Reno; <sup>4</sup>Colorado Dept. of Agriculture, Palisade, CO; <sup>5</sup>Utah St. Univ.

Herbivore behavior and performance can be related to host plant qualities that vary with growing conditions, nutrient availability, foliage age or prior experience, or genotype. Such variation across a broad geographic range may account for some of the mixed results seen following the introduction of the saltcedar leaf beetle *Diorhabda elongata* (*sensu lato*) for biocontrol of *Tamarix* spp. A series of field and greenhouse studies in California and Nevada showed how several factors alter insect responses, including: 1) nitrogen (NO<sub>3</sub>) augmentation accelerated larval growth and time to pupation, although pupae were significantly smaller than insects on plants grown in control soil; 2) moderate increase in soil salinity had no significant effect on growth, but high levels (resulting in visible salt exudation) caused foliage to be avoided by larvae and adults; 3) in the field, plants defoliated the previous year were avoided by adult beetles early in the season; 4) prior defoliation reduced larval growth and survival in a field experiment but had no effect when defoliation was simulated with potted plants - tissue age probably caused control (non-defoliated) plants to be a poorer resource; 5) larval growth was slightly better on *T. ramosissima* foliage than on *T. parviflora*, *T. aphylla* or a *T. aphylla* x *ramosissima* hybrid grown in pots; 6) under 'natural' field conditions, *T. parviflora* was avoided by adult insects; 7) oviposition on field transplants of the previous 4 genotypes was high on *T. ramosissima* and the *T. aphylla* x *ramosissima* but very low on *T. aphylla* and *T. parviflora*, while all genotypes close (< 2 m.) to defoliated 'natural' *T. ramosissima* were eaten by dispersing starved larvae but at greater distance oviposition alone led to defoliation of only the 'preferred' genotypes. Host factors, particularly host species, account for target plant avoidance and poor *Diorhabda* establishment at some sites, and may reduce biocontrol agent performance at others, so should be incorporated into introduction plans in order to better predict establishment success across the infested range of tamarisk/saltcedar.