

## **The timing of diapauses controls phenology of the tamarisk leaf beetle, *D. carinulata*, in the Virgin River drainage**

Dan W. Bean<sup>\*1</sup>, Melissa O'Neil<sup>2</sup> and Tom L. Dudley<sup>2</sup>

\* [dan.bean@ag.state.co.us](mailto:dan.bean@ag.state.co.us)

<sup>1</sup>Colorado Department of Agriculture, 750 37.8 Rd., Palisade, CO 81526

<sup>2</sup>Marine Science Institute, University of California 2125, Santa Barbara, CA 93106

Populations of the tamarisk leaf beetle, *D. carinulata*, released for the biological control of tamarisk, originated from two locations in central Asia. At most of the experimental sites beetles originated from a location near the town of Fukang in northwestern China. Beetles released at the Delta, Utah experimental site were originally collected near the town of Chilik, Kazakhstan. The environmental cues controlling diapauses in the Fukang beetles are known but those controlling induction in the Chilik beetles had yet to be characterized. Under laboratory conditions the Chilik beetles, collected from the Virgin River, enter diapauses when day lengths are shorter than 14 hr 28 min. This is in contrast to beetles collected near Lovell, WY, and originating in Fukang, which enter diapauses when day lengths are shorter than 14 hr 45 min. In the field, at sites on or near the Virgin River, beetles enter diapauses early in the season (late July) as predicted from laboratory based data on day length requirements for reproductive activity. Although this limits population expansion it is clear that early season reproductive activity by the overwintering generation enables sufficient population expansion so that beetles continue to move southward. Implications for the rate of southward movement by *D. carinulata* are discussed.