

BEETLE - MANIA

BIOLOGICAL CONTROL OF SALTCEDAR IN TEXAS

VOLUME I, I

SPRING 2009

Leaf Beetles Released Against Saltcedar in Texas

The saltcedar leaf beetle feeds only on saltcedar and relatives in the genus *Tamarix*.

Beetles may occasionally feed on a related desert shrub, *Frankenia*, but cause little damage.

Beetles are now widely distributed across Nevada, Utah, Wyoming and have not attacked plants other than saltcedar.

Thousands, and hopefully millions, of small leaf beetles are now overwintering in west Texas, waiting for spring weather to begin feeding on tender leaves of saltcedar trees. These exotic insects have been released by USDA-ARS, Texas AgriLife Extension and partners in an effort to push back invasive saltcedar from the rivers, streams and lands of west Texas.

Following years of foreign exploration and research by Dr. Jack DeLoach, USDA-ARS research entomologist at Temple and other scientists, the saltcedar leaf beetle was first released in west Texas in

2004. One population released on Beals Creek near Big Spring, Tx rapidly established and has increased annually. In the fall of 2008, this population defoliated almost all of the saltcedar trees across 150 acres and along 6 miles of Beals Creek. Of the trees repeatedly defoliated during the past four years, tree canopy has decreased by 85-95% and about 20% of the trees are now dead. Dr. DeLoach reports that in this area, grasses and other plants are recovering with the increased sunlight.

With the success at Big Spring, the challenge now is

to release and establish beetles at other sites in west Texas.



Saltcedar Leaf Beetle

Texas AgriLife Extension Implementation Program

With the success of the leaf beetles at Big Spring, Texas AgriLife Extension organized the Saltcedar Biological Control Implementation Program to educate and assist land-owners and land and water resource managers in using the leaf beetle for biological control for saltcedar. Texas

AgriLife Extension, in partnership with USDA-Agricultural Research Service and Natural Resource Conservation Service, is working with land owners and regional water authorities and districts to establish new populations of beetles along major waterways in west Texas. Beetles have been re-

leased at 23 sites, including the western watersheds of the Red, Brazos and Colorado Rivers and along the Pecos and Rio Grande Rivers. These sites will be monitored in 2009 and additional sites will be established as time and resources allow. Stay tuned.

How Do Leaf Beetles Impact Saltcedar ?

Saltcedar is hard to kill. Like mesquite, the top can be killed but buds just below the ground can quickly regrow new shoots. Leaf beetles only eat saltcedar leaves and then tender bark, so how can this offer any hope of controlling saltcedar ?

Research by Jeremy Hudgeons, who earned his MS degree in Entomology from Texas A&M, found that saltcedar trees defoliated by leaf beetles have

less stored carbohydrates in their root crowns. As beetles consume the leaves, saltcedar trees must use these food reserves to regrow new leaves 2-3 times during the summer. And during the time trees have no leaves, they must use stored carbohydrates to stay alive. Jeremy discovered that un-attacked trees have 9-13% stored carbohydrates in late winter, whereas trees defoliated for 2-4 consecutive

years have only 2-3%. Without full reserves, branches begin to die and canopies thin. Saltcedar trees slowly starve to death.

Trees at Big Spring, TX began to die after 4 years of repeated defoliation. Biological control of saltcedar requires patience. Meanwhile, saltcedar trees without leaves use less water and allow sunlight to reach the soil, encouraging grasses and other plants.

“Saltcedar beetle larvae eat leaves. Without leaves, saltcedar trees slowly starve to death”



Trees shown above have been defoliated mid-summer and early fall by saltcedar leaf beetles at Beals Creek, near Big Spring, Texas. As trees re-grow new leaves, beetles return, deposit eggs on the new growth, and larvae again consume the leaves, further depleting the trees resources. Although not yet “grave-yard” dead, this tree will continue to dieback. Efforts are now underway to achieve this dramatic success at other locations in Texas.

Leaf Beetles Thrive on the Pecos River in Texas

Leaf beetles are finding life on the Pecos River is much to their liking. In 2006, Texas AgriLife Extension, working with the Pecos Irrigation District, collected saltcedar beetles from the Big Spring population and released them at a site on the Pecos River. The beetles thrived and by the following year, defoliated all of the saltcedar trees across 90 acres. After a slow start in 2007, beetles rebounded and defoliated the

area again. In the fall of 2008, Mark Muegge, Allen Knutson and Harper Caldwell, Texas AgriLife Extension, found great numbers of beetles had defoliated all of the saltcedar along 1.75 miles of the Pecos river. This is the most rapid increase and dispersal of saltcedar beetle yet observed in Texas.

Much of the saltcedar along the Pecos River has been killed by a recent herbicide program.

About 3,000 acres remain and is a seed source for re-infesting the treated area. The beetles are coming.



Meet the Saltcedar Leaf Beetle

The saltcedar leaf beetle, like many insects, has four life stages: egg, larva, pupa and adult.



The adult stage is a small beetle. It looks like an elm leaf beetle or small cucumber beetle. During the summer, adults mate, fly in search of saltcedar, and females deposit eggs on leaves and live a few weeks. In the fall, adults crawl under leaf litter on the soil and spend the winter.



Overwintering adults remain inactive until spring. In the spring, adults glue their eggs on saltcedar leaves either singly or in masses of 2-20. Young larva emerge from the eggs in about 5 days. The larvae feed for about 12-14 days on saltcedar



leaves and tender bark. Full grown larvae are black with a yellow strip along each side and are about 1/3 inch long. Once full size, larvae crawl to the soil and enter the pupal stage beneath leaf litter.

During the pupa stage, the larva transforms to the adult stage. The entire life cycle requires about 33 days during the



hot summer and longer during spring and fall. Four generations are completed annually in Texas.

Shown above:
Large trees
defoliated by
saltcedar leaf
beetles along
the Pecos
River. August,
2007.

**BEETLE-MANIA is a newsletter on
biological control of saltcedar in
Texas. To be included on the mailing
list, please contact Allen Knutson.**

Allen Knutson
Professor and Extension Entomologist
Texas AgriLife Research and Extension
Urban Solutions Center
17360 Coit Road
Dallas, TX 75252

Phone: 972-952-9222
Fax: 972-952-9632
E-mail: a-knutson@tamu.edu

**For more information about this program,
contact Allen Knutson at 972-952-9222 or via
e-mail a-knutson@tamu.edu or Mark Muegge
Texas AgriLife Extension Entomologist at Ft.
Stockton, 432-336-8585, , e-mail: ma-muegge@tamu.edu**

