Biological Control in Colorado

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RiversEdge West
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Department of Agriculture
Conservation Services Division

Overview

- Insectary
- Integrated Pest Management
- Biological Control
- Types of Biological Control
- Risks and limitations
- Canada Thistle Rust Fungus
- Leafy Spurge and Flea Beetles
- Diorhabda and Tamarisk
- Request-a-Bug Collection and Shipment

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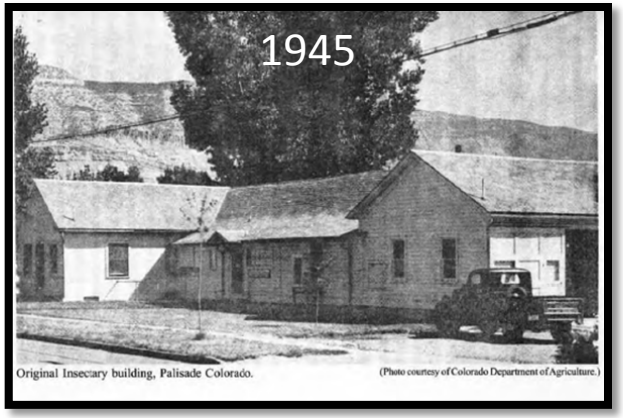
Palisade Insectary

- CDA- part of Conservation Services
- Offers biocontrols for 14 pests (3 insects and 11 noxious weeds)
- 25 agents to study, research, collect and redistribute throughout the state



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Integrated Pest Management

What is Biological Control?

- Biological control (biocontrol) is the use of natural enemies, including insects, mites and pathogens, to control pests, including insect pests and noxious weeds
- Biocontrol is an ecologically based pest control method. The goal is suppression of the weed or insect pest, not eradication. Often the desired results take years to achieve
- Biological control needs to be safe, inexpensive, sustainable and effective
- 3 types of biological control
  - Inundative
  - Augmentive
  - Classical

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Inundative Biological Control

Release of large numbers of predators or parasitoids to overwhelm target pest

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Augmentive Biological Control

Conservation of natural enemies

Refuge/Habitat

Cultural practices

Consider when spraying

Classical Biological Control

Diorhabda carinulata

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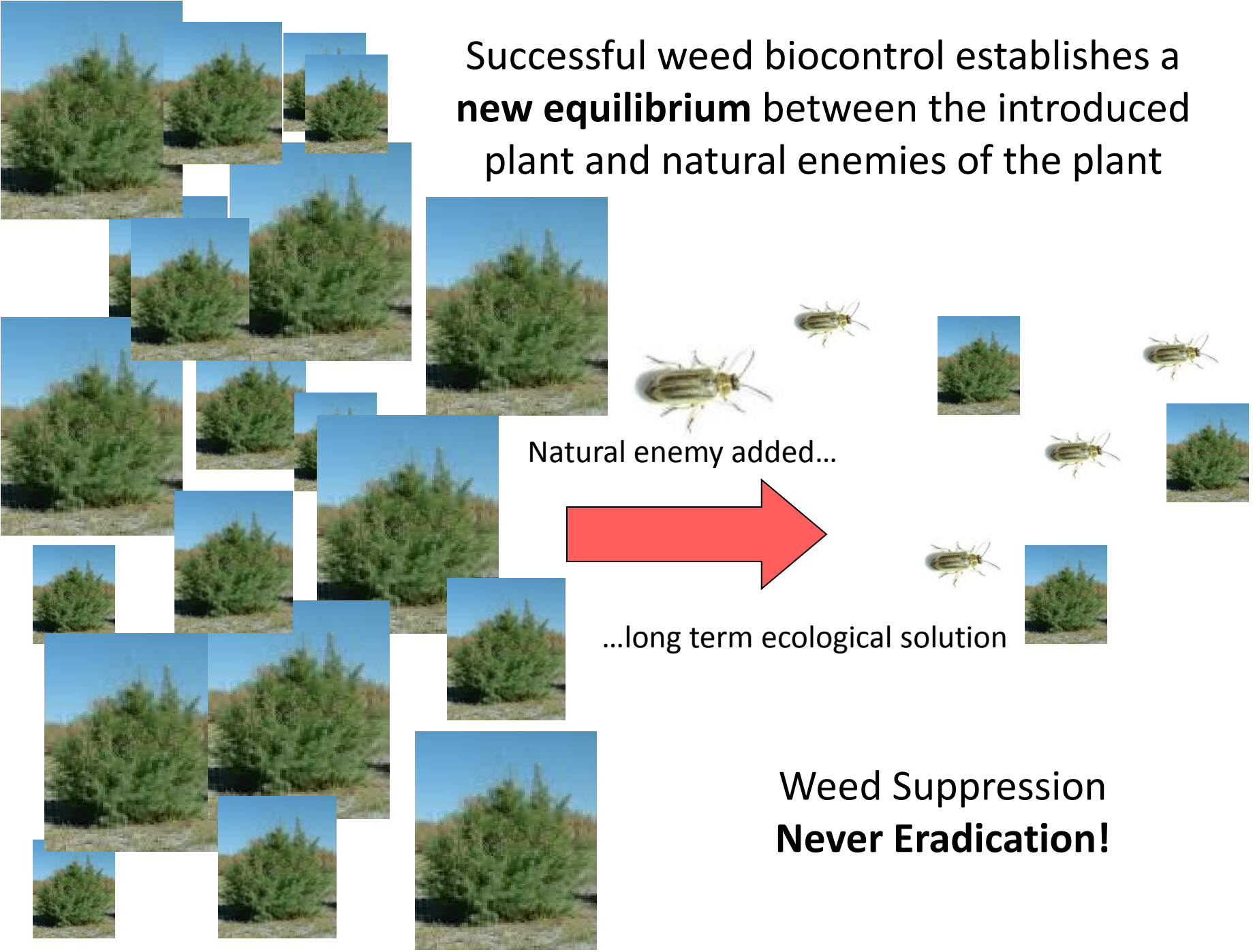
Successful weed biocontrol establishes a **new equilibrium** between the introduced plant and natural enemies of the plant



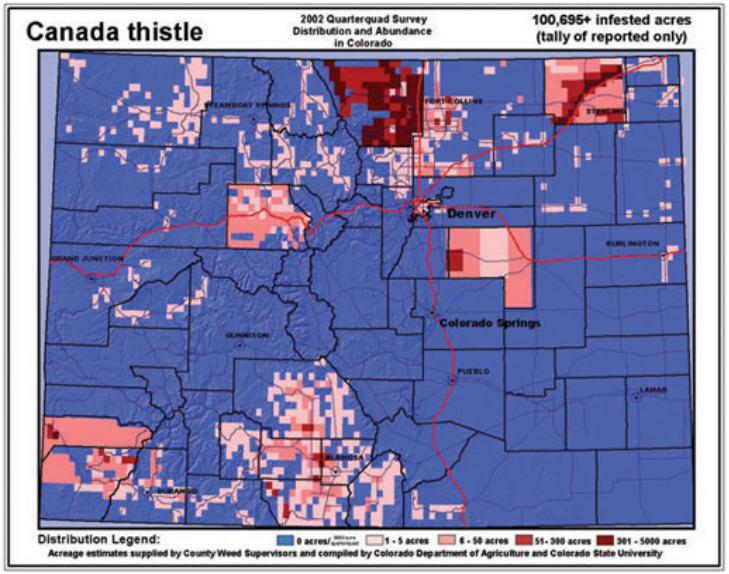
Weed Suppression
Never Eradication!

Risks and limitations of biocontrol

- Non target effects
  - Non target host impact is evaluated on similar species, similar ecological niche, threatened and endangered or economically important
  - Choice and no-choice testing, Environmental assessment
- Does not eradicate pests
- May take several years to see desired results
- Not all introduced biocontrols establish and not all that establish provide control

Canada Thistle- *Cirsium arvense*

- Perennial colony forming weed
- Reproduces both by seed and through root buds
- Nutrient stores in root system require years to deplete
- 400,000 infested acres



The rust fungus *Puccinia punctiformis,* a biocontrol for Canada thistle (*Cirsium arvense*)

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Life Cycle

Winter

Germinating basidiospores produce hyphae that travel down to survive in roots

Early Spring

Systemically diseased shoots from infected root

Late Spring

Spermagonia (yellow) cross to produce aeciospores (red-brown) on diseased shoots

Summer

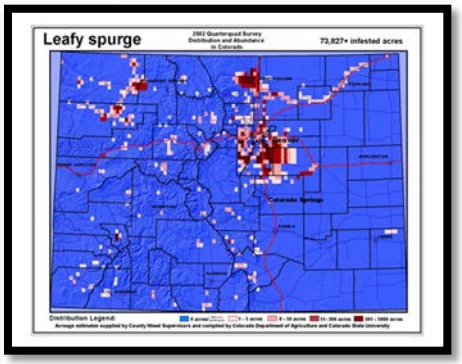
Aeciospores blow to neighboring shoots that give rise to urediniospores

Fall

Uredinia produce teliospores on senescing leaves that infect rosettes

Leafy Spurge (*Euphorbia esula*)

- Perennial noxious weed
- Originated in Asia
- Discovered in MA in 1827
- Reproduces from seed or vegetatively
- White milky latex present in all parts of the plant (Causes severe irritation of mouth and digestive tract in cattle)



Leafy Spurge Biocontrol

Flea Beetles (*Aphthona* spp.)

- Adults defoliate leaves
- Larvae feed on roots
- Very effective in rocky soils in full sun

Longhorned beetle (*Oberea erythrocephala*)

- Stem miner that lay eggs in the stems
- Larvae hatch and burrow down to root crown
- Effective in moist sandy soil

Agents are available late June to mid July

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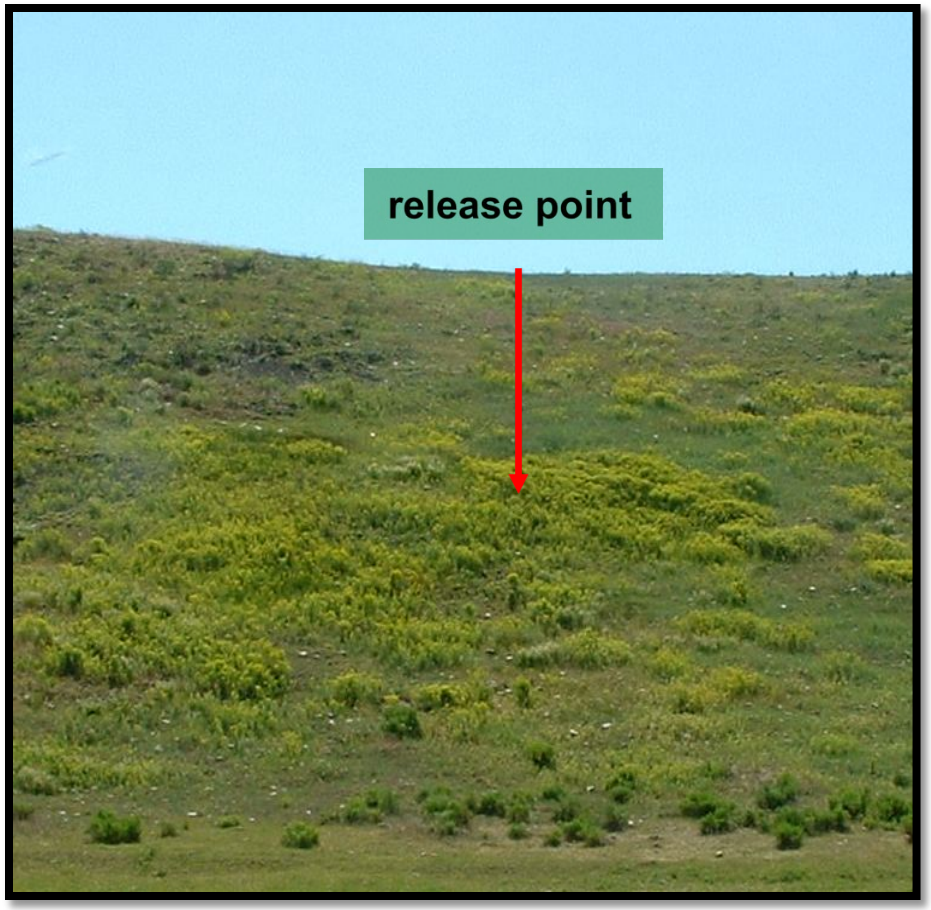
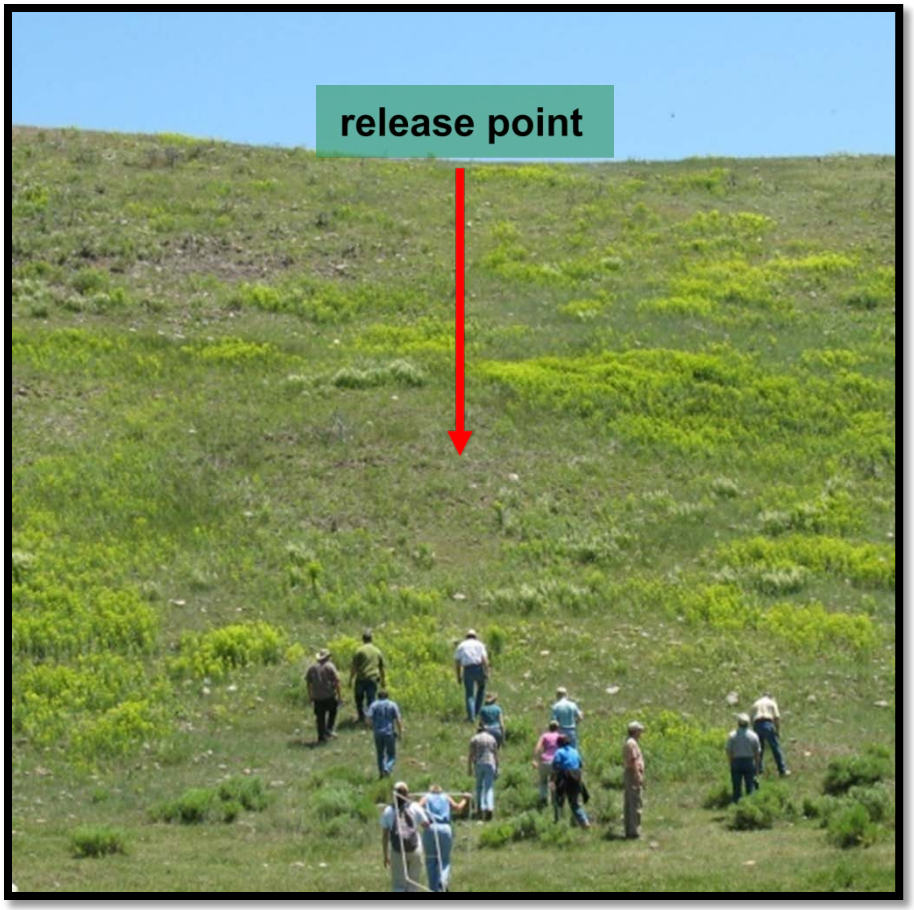
Leafy Spurge Biocontrol

Rio Blanco Co. – Flea beetles



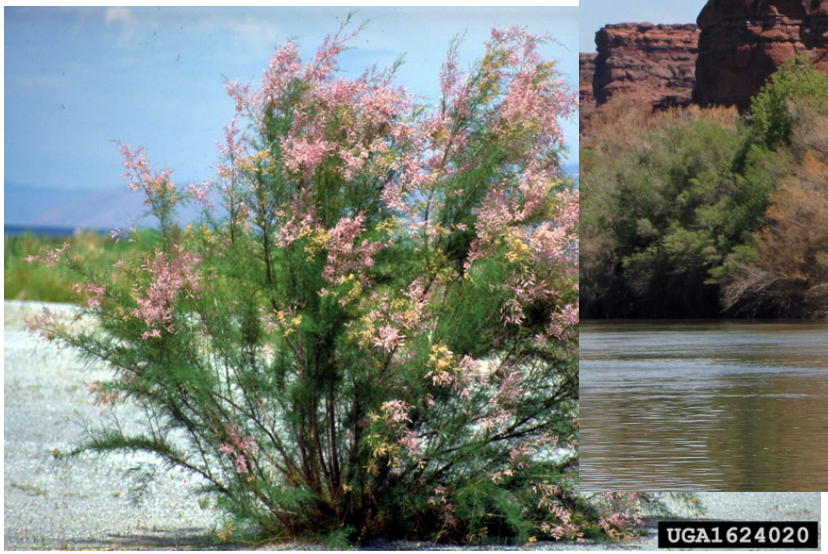
2007



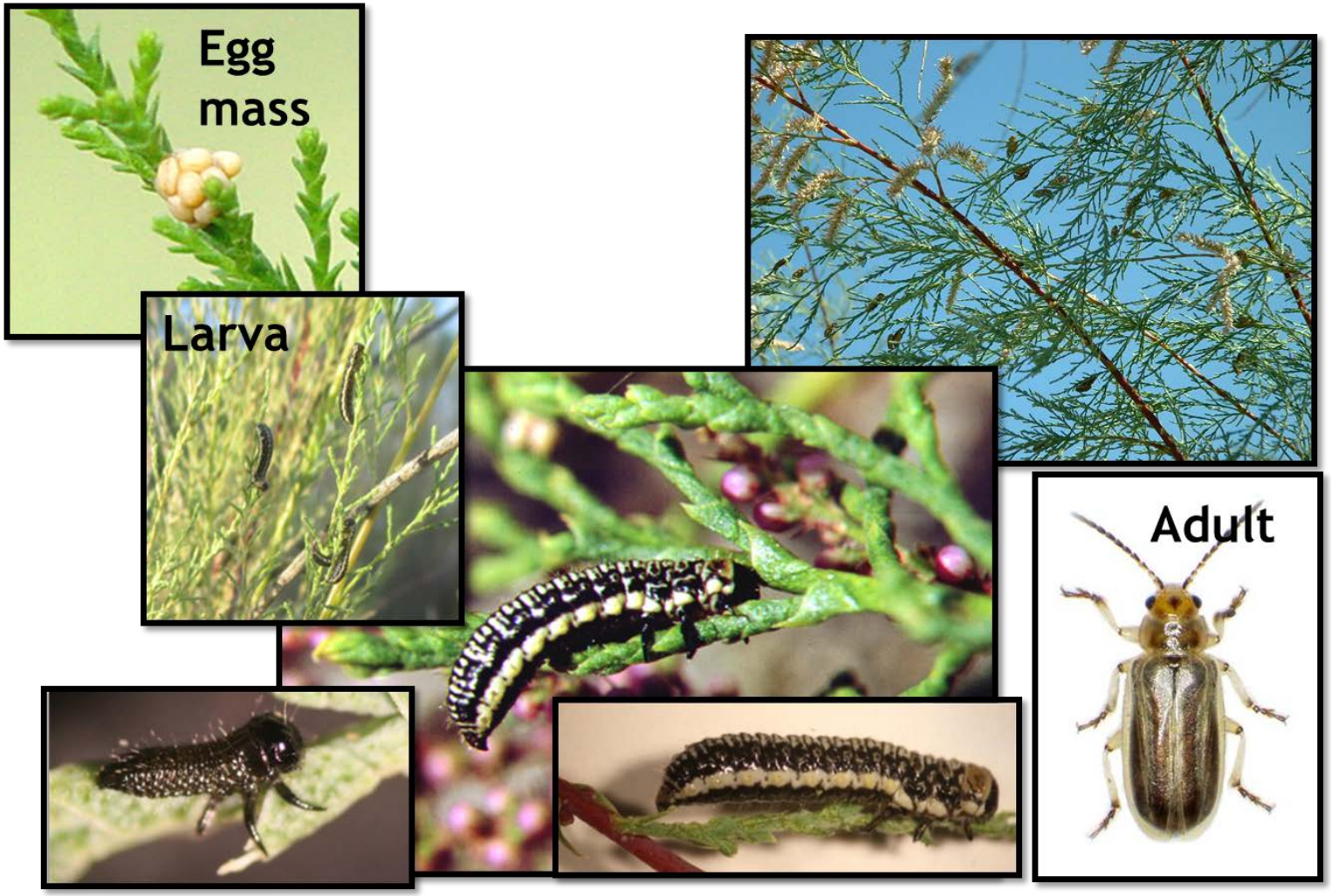
2008

Saltcedar- *Tamarix chinensis* and *Tamarix ramosissima*

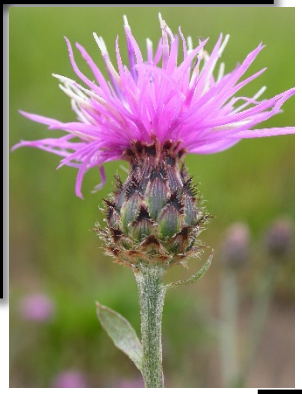
- Introduced ornamental in 1800s
- 3-20 ft. tall shrubby tree
- Lowers water table
- Salinates soil



Tamarisk - Diorhabda carinulata





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How To Order Biological Controls

Call the Palisade Insectary

Toll Free: (866) 324-2963

Submit online to request a bug

www.palisadeinsectary.

Fee	Description
$50	Canada Thistle - rust fungus $50,
$30.00	Dalmatian Toadflax
$30.00	Diffuse Knapweed
$35.00	Field Bindweed
$30.00	Leafy Spurge
$30.00	Musk Thistle
$30.00	Puncturevine
$30.00	Russian Knapweed
$30.00	Spotted Knapweed
$30.00	Yellow Toadflax

Acknowledgments

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