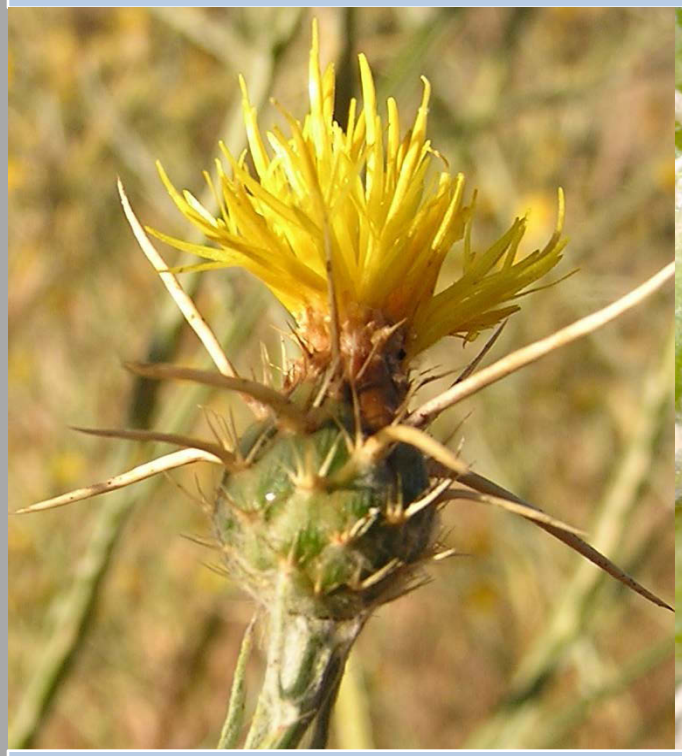
BIOLOGICAL CONTROL OF WEEDS



OREGON DEPARTMENT OF AGRICULTURE

NOXIOUS WEED CONTROL PROGRAM

ERIC M. COOMBS

ecoombs@oda.state.or.us

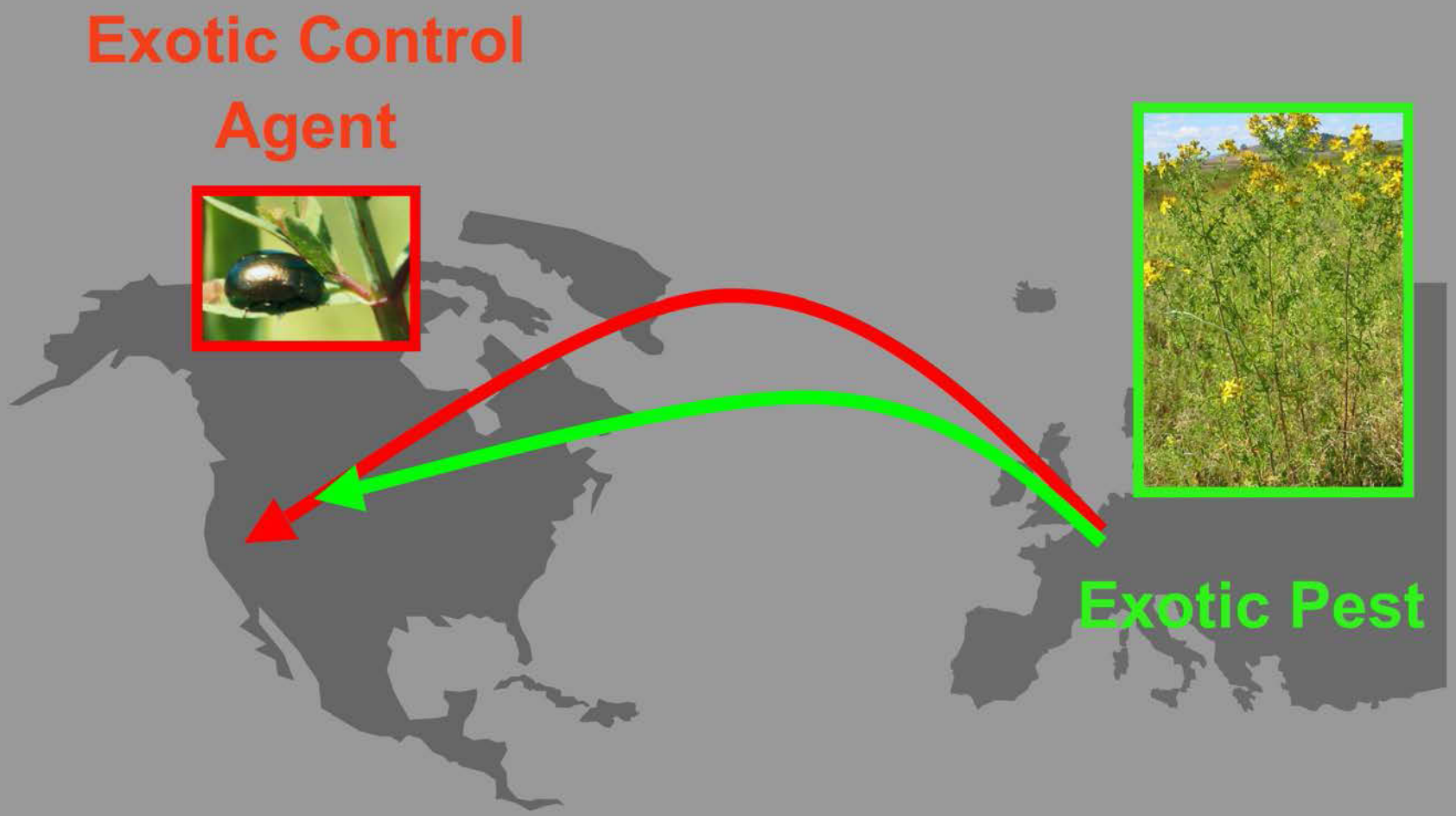
Oregon Department of Agriculture

BIOLOGICAL CONTROL OF WEEDS

What is classical biological control?

The purposeful introduction of selected natural enemies of a targeted weed.

BIOLOGICAL CONTROL OF WEEDS

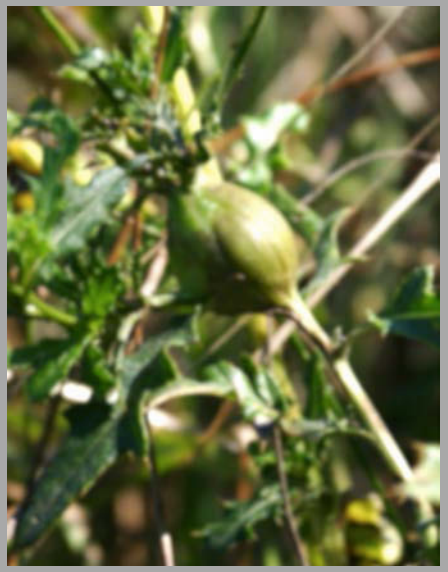


BIOLOGICAL CONTROL OF WEEDS

How does biocontrol work?

By reducing the density and competitive ability the targeted weed.

Direct

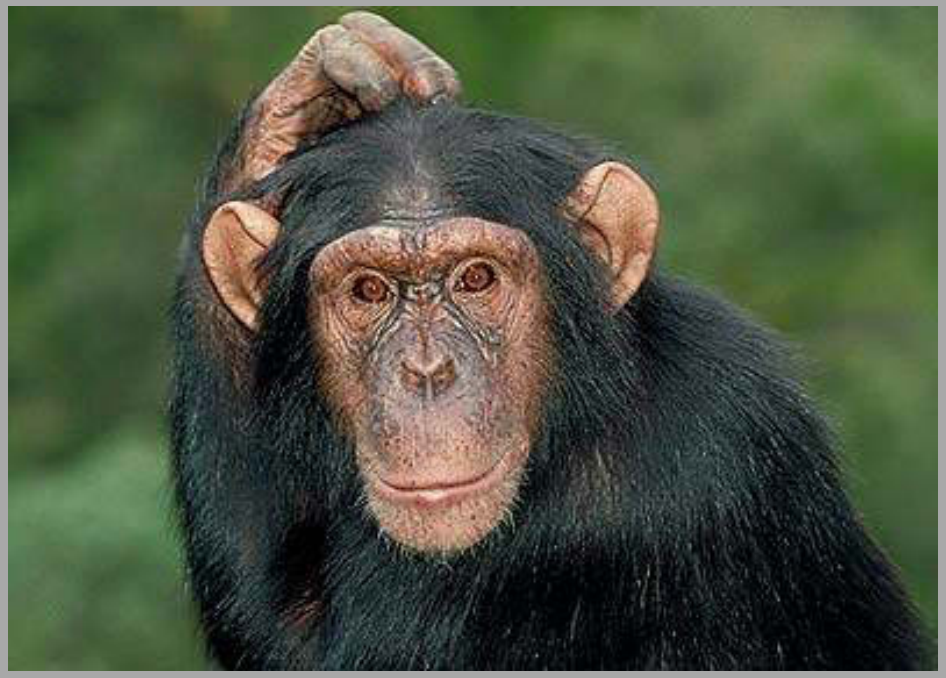


Indirect

BIOLOGICAL CONTROL OF WEEDS

Who can do classical biological control?

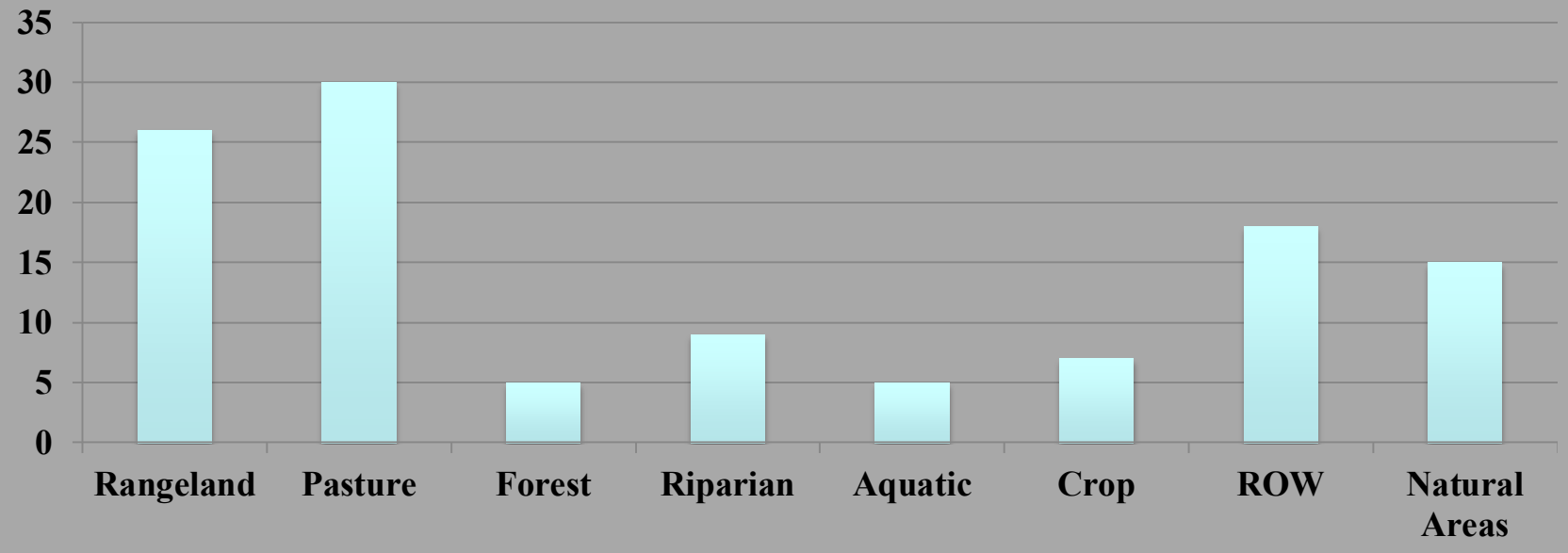
At first, trained professionals, but later on, almost anyone can participate.



BIOLOGICAL CONTROL OF WEEDS

Where can we implement biocontrol?

Usually anywhere where the weeds will not be disturbed too much for at least 3 years.



Biological control- multi-target attack

Multi vs single, area, & order?

Flower feeder

Seed capsule feeder

Defoliator

Stem borer

Root borer

Root galler

BIOLOGICAL CONTROL OF WEEDS IN OREGON

- **Insects (69)**
  - beetles (39)
  - flies (16)
  - moths (14)
- **Mites (3)**
- **Nematode (1)**
- **Pathogens (2)**

BIOLOGICAL CONTROL OF WEEDS IN OREGON

BIOCONTROL AGENT RELEASE FORMS

BIOLOGICAL CONTROL AGENT RELEASE FORM

Target Weed: Yellow starthistle (Common name) Date: 04 / 07 / 20 09 (MM / DD / YY)

Agent: Puccinia jaceae v. solstitialis (Scientific name) Number Released: 16 oz

County: Josephine T: 36S (Township N/S) R: 5W (Range E/W) Sec.: 24 (Section) 1/4

Latitude: 42.4255 (Decimal degrees) Longitude: -123.2322 (Decimal degrees) GPS Derived? Yes ☒ No ☐

Land owner: BLM ☐ USFS ☐ Private ☐ USFWS ☐ State ☐ Other ☒ County (List)

Land manager: Josephine County (BLM Districts & Resource Area/ National Forest & Ranger District/ Refuge/ DOT/ BPA/ Cid/ County/ Rancher/ etc.)

Site name: S. Grants Pass (Use geographical reference, mountain, river, valley, road, campground, power line, etc.)

SITE DATA: *Check all items that apply and fill in the blanks, please provide a map on back.*

Nearest town: Grants Pass Road: Foothill Blvd. Mile post:

Weather: Clear ☐ Partly Cloudy ☒ Cloudy ☐ Rain ☐ Temp F:_____ Wind:_____ (MPH)

Slope: None ☐ Slight ☒ Moderate ☐ Steep ☐ Aspect: N ☐ S ☐ E ☐ W ☐

Soil: Sandy ☒ Loam ☒ Silt ☐ Gravel ☐ Clay ☐ Elevation:_____

Terrain: Valley ☒ Foothill ☐ Mountain ☐ Plain ☐ River ☐ Lake/Pond ☐ Other:_____

Vegetation type: Grassland ☒ Shrubland ☐ Cropland ☐ Riparian/Wetland ☐ Conifer Forest ☐
Deciduous Forest ☐ Mixed Forest ☒ Other ☐ _____

Plant cover %: Target weed 10 Forbs 10 Grasses 50 Shrubs 10
Trees 20 Litter_____ Bare ground_____

Dominant plant species (List): YST, grass, trees (madrona)

Land use: Range ☐ Timber ☐ Wildlife ☐ Right of Way ☒ Pasture ☐ Crop ☐ Vacant ☐
Wetland ☐ Recreation ☐ Mining ☐ Other ☐ (List)_____

Disturbance factors: Grazing ☐ Logging ☐ Road ☒ Fire ☐ Flood ☐ Cultivation ☐ Construction ☐ Other ☐

Infestation type: Isolated ☐ Patchy ☒ Linear ☒ Continuous ☐

Infestation size: < 1A (Your best estimate) (Acres) Target weed height: 6" (Feet) Weed density: 30 (sq. yd. or sq. meter)

Plant Phenology: Seedling ☒ Rosette ☒ Bolting ☒ Budding ☐ Flowering ☐ %____ Seeding ☐ Dormant ☐

Is this BC Agent already present? Yes ☐ No ☒ Did not Look ☐ Abundance per minute: _____

Other BC Agents present (List): CHSU, CHAU, URSI, BRBR, EUVI

Source of Agents: ODA - Greenhouse Date collected: 4/7/09

Stage released: Egg ☐ Larva ☐ Pupa ☐ Adult ☐ In plant material ☒ Galls ☐ Other ☐

Cooperators: ODFA

Released by: E. Coombs, C. Park (PP&) Reported by:_____
ODA Database Record # 2440

Directions to release site: S. of Grants Pass on Foothill Blvd. go to above Rel. is about ¼ mile from County line E side - (southend of strip clearing). (from nearest town)

Please draw or attach a map of the release site: Indicate the release site within an "X" in a circle. Indicate North with an arrow. Label roads and features. (This is so someone can find it 10 –20 years from now.) A Google Earth Map is also very helpful as an attachment.

Nontarget species information: Are there native plants in the same genus as the target weed present at the release site? Yes ☐ No ☐

List Species: _____

Remarks: (*Condition of insects, breeding, or egg laying observed, predators, other species present, etc.*)

USDA – APHIS or **ARS Release Rec. No.** *(If applicable)*:_____

Please Return this original form to:

Weed Control - ODA,
635 Capitol Street NE,
Salem, OR 97301-2532

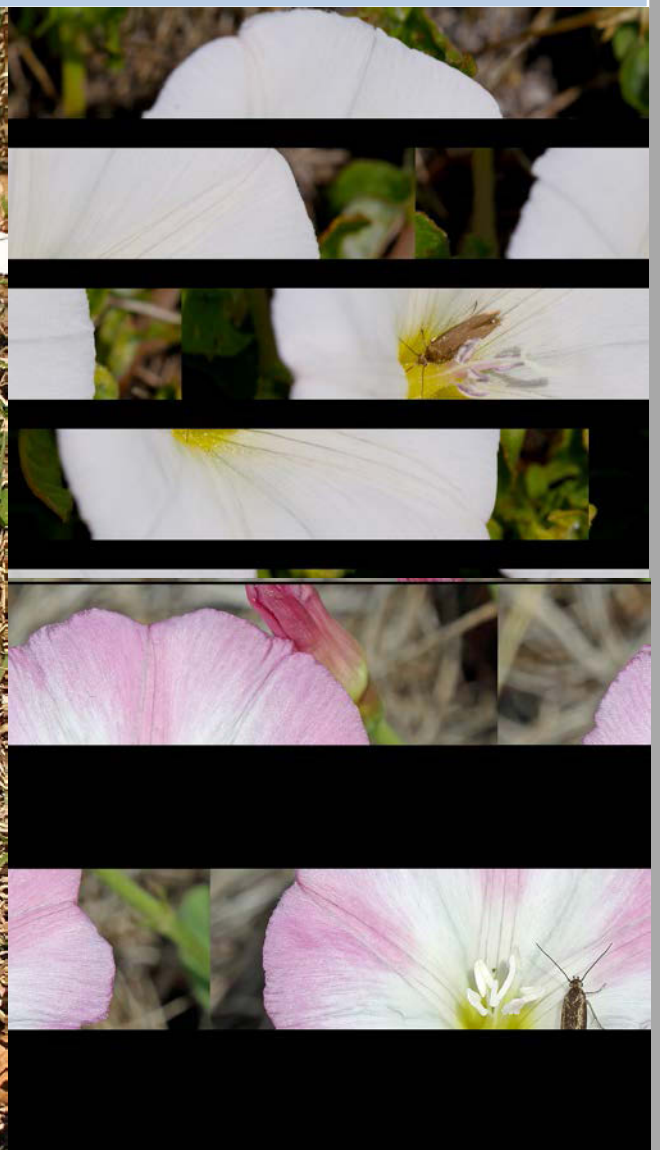
Do not forget to make a copy for your records. If you have any questions, call 503-986-4621.

ODA BCRF 2008

BIOLOGICAL CONTROL OF WEEDS
MONITORING

- Establishment
- Population build up (Abundance & Density)
- Spread
- Attack rate
- Damage level
- Distribution
- Impact on host
- Community changes
- Documentation

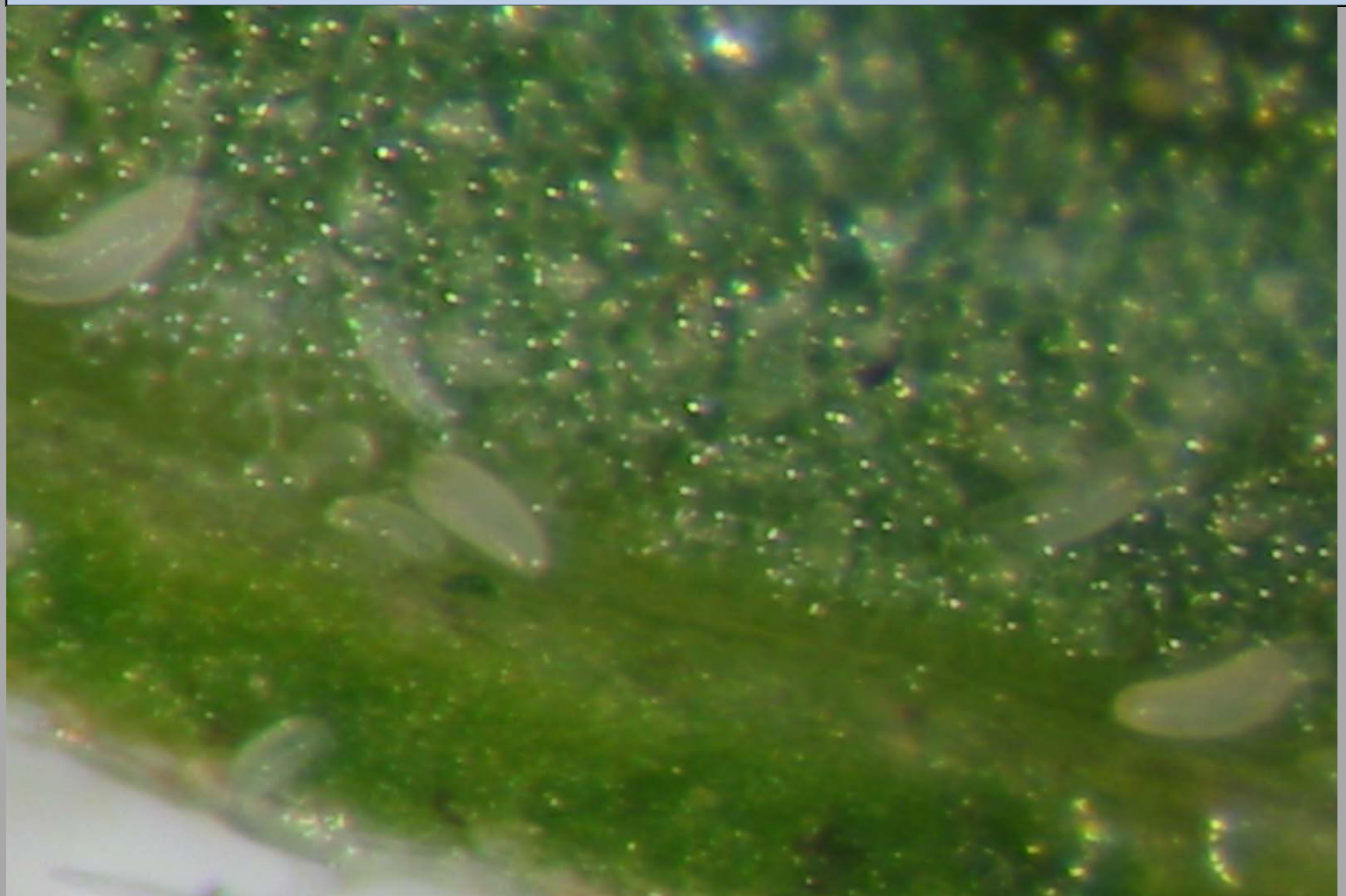
BIOLOGICAL CONTROL OF
FIELD BINDWEED
Convolvulus arvense



BIOLOGICAL CONTROL OF

FIELD BINDWEED

Aculops malherbae (Aceria) – gall mite



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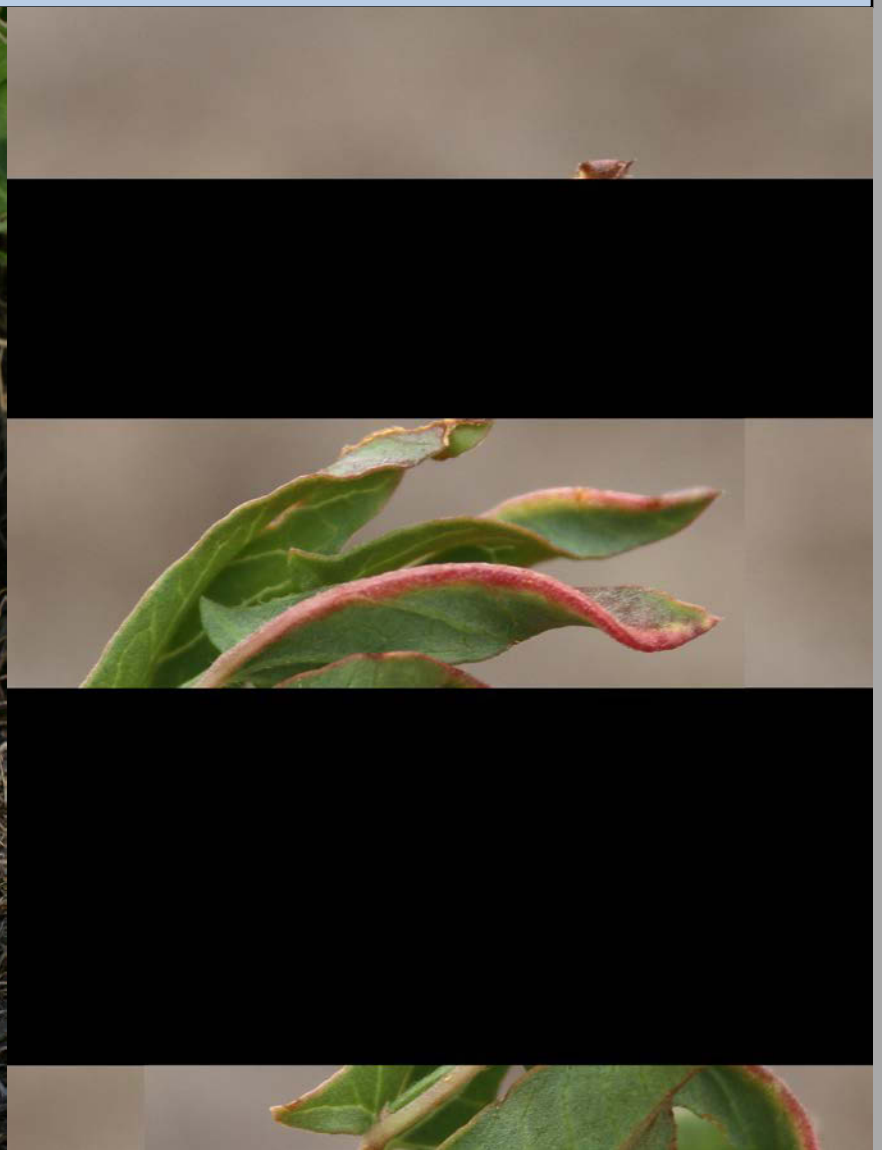


BIOLOGICAL CONTROL OF

FIELD BINDWEED

Tyta luctuosa – defoliating moth

BIOLOGICAL CONTROL OF

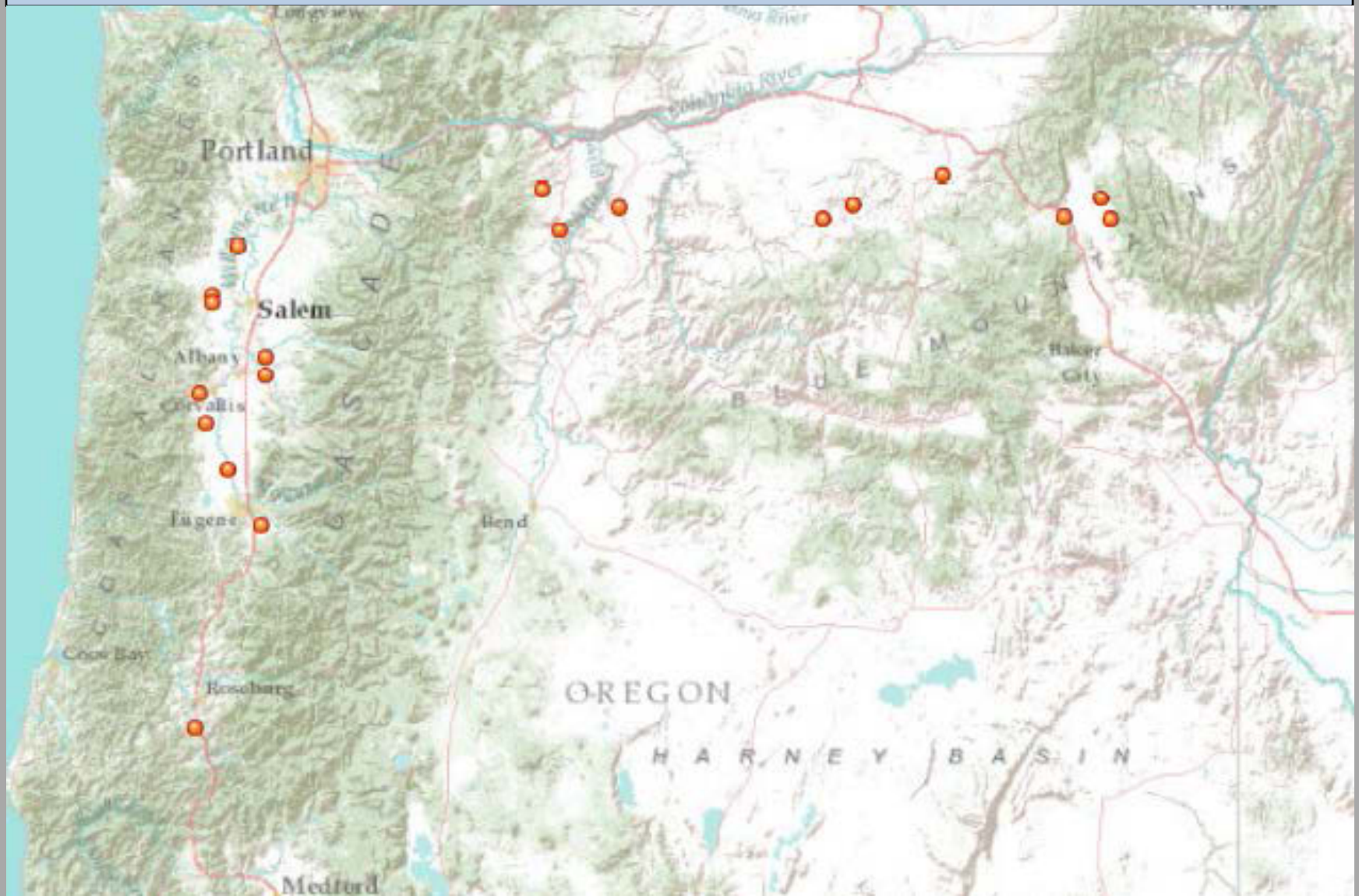
FIELD BINDWEED

Tyta luctuosa – defoliating moth

BIOLOGICAL CONTROL OF

FIELD BINDWEED

Tyta luctuosa – defoliating moth



BIOLOGICAL CONTROL OF
LEAFY SPURGE
Euphorbia esula

BIOLOGICAL CONTROL OF

LEAFY SPURGE

Aphthona flava – flea beetle

BIOLOGICAL CONTROL OF

LEAFY SPURGE

Aphthona lacertosa – flea beetle

BIOLOGICAL CONTROL OF

LEAFY SPURGE

Aphthona lacertosa – flea beetle

BIOLOGICAL CONTROL OF

LEAFY SPURGE

Aphthona nigriscutis – flea beetle

BIOLOGICAL CONTROL OF

LEAFY SPURGE

Oberea erythrocephala – root boring beetle

BIOLOGICAL CONTROL OF

LEAFY SPURGE

Oberea erythrocephala – root boring beetle

BIOLOGICAL CONTROL OF
POISON HEMLOCK
Conium maculatum

BIOLOGICAL CONTROL OF

POISON HEMLOCK

Agonopterix alstroemeriana – defoliating moth

BIOLOGICAL CONTROL OF
POISON HEMLOCK
Agonopterix alstroemeriana – defoliating moth

BIOLOGICAL CONTROL OF

POISON HEMLOCK

Agonopterix alstroemeriana – defoliating moth

BIOLOGICAL CONTROL OF PUNCTUREVINE

Tribulus terrestris

BIOLOGICAL CONTROL OF

PUNCTUREVINE

Microlarinus lareynii – seed weevil

BIOLOGICAL CONTROL OF

PUNCTUREVINE

Microlarinus lareynii – seed weevil

BIOLOGICAL CONTROL OF
RUSH SKELETONWEED
Chondrilla juncea

BIOLOGICAL CONTROL OF

RUSH SKELETONWEED

Cystiphora schmidti – gall midge

BIOLOGICAL CONTROL OF

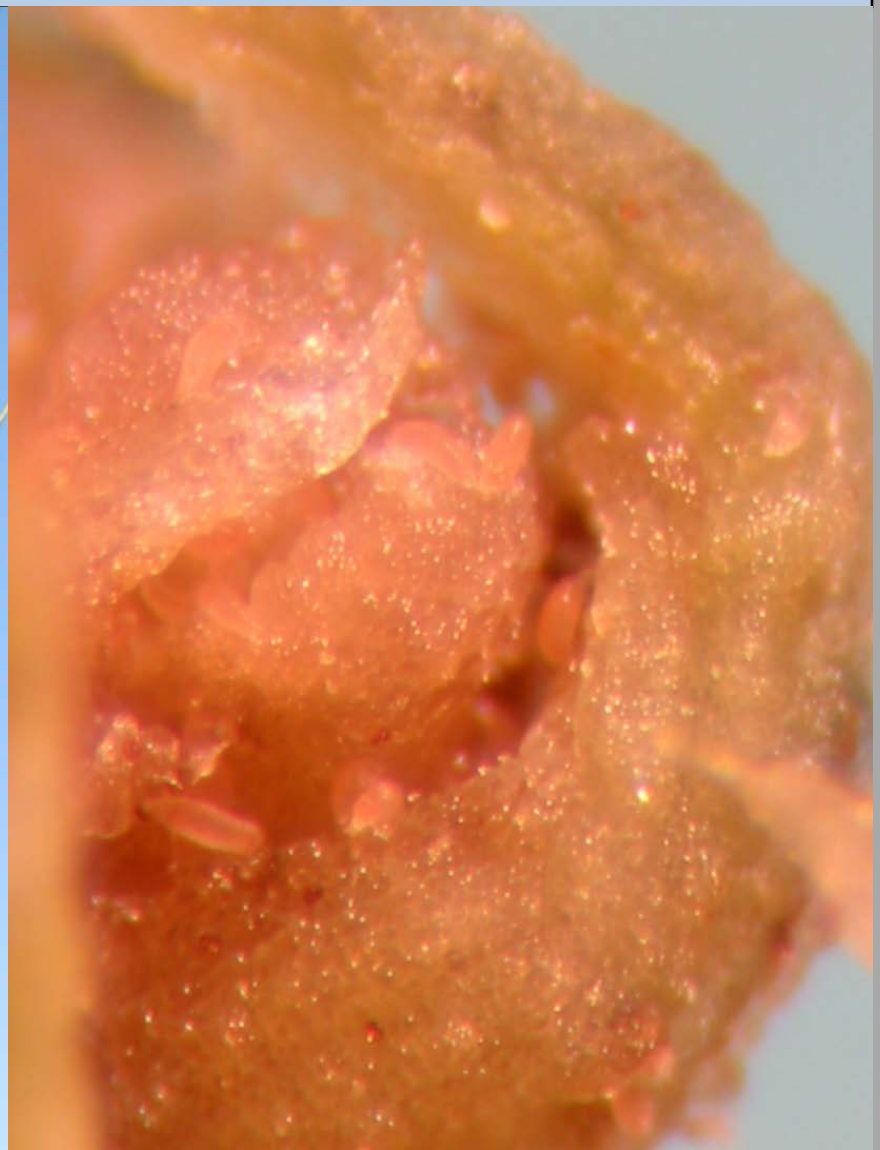
RUSH SKELETONWEED

Eriophyes chondrillae – gall mite

BIOLOGICAL CONTROL OF

RUSH SKELETONWEED

Eriophyes chondrillae – gall mite



BIOLOGICAL CONTROL OF

RUSH SKELETONWEED

Puccinia chondrillina – rust fungus

BIOLOGICAL CONTROL OF

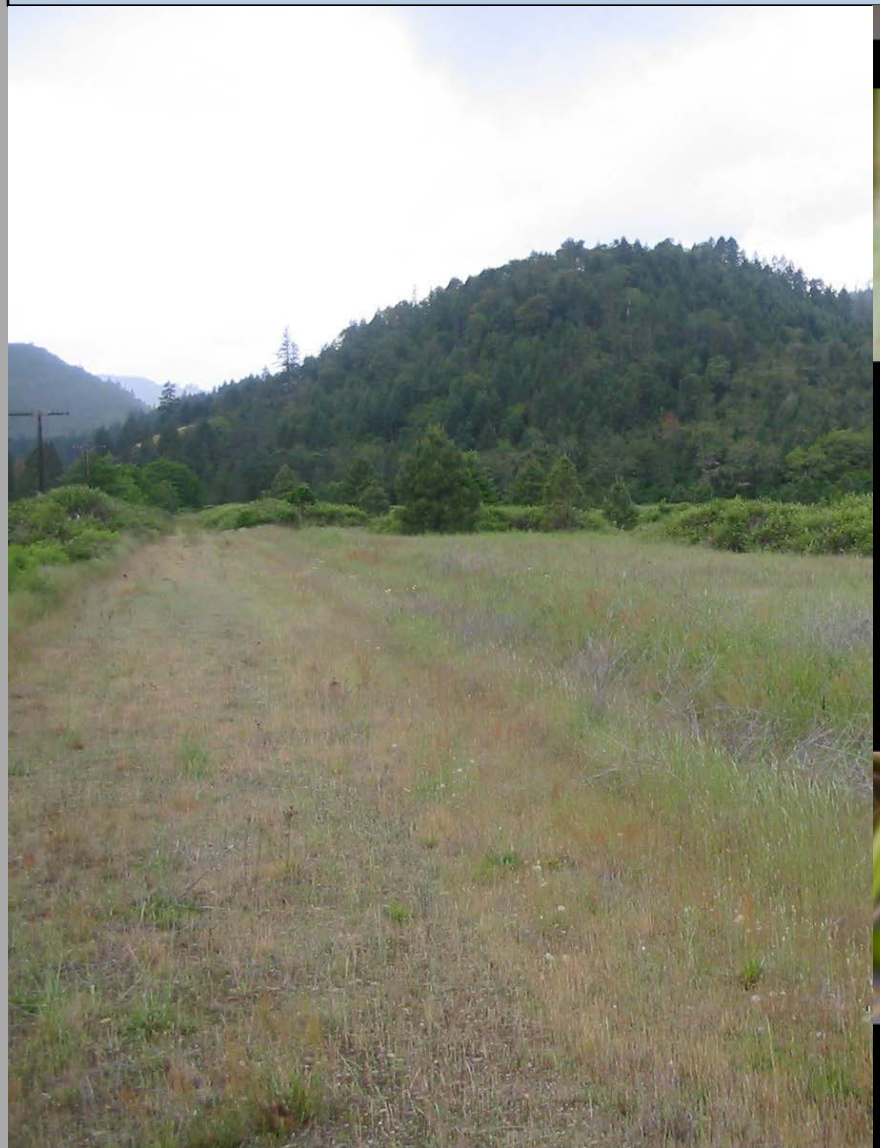
RUSH SKELETONWEED

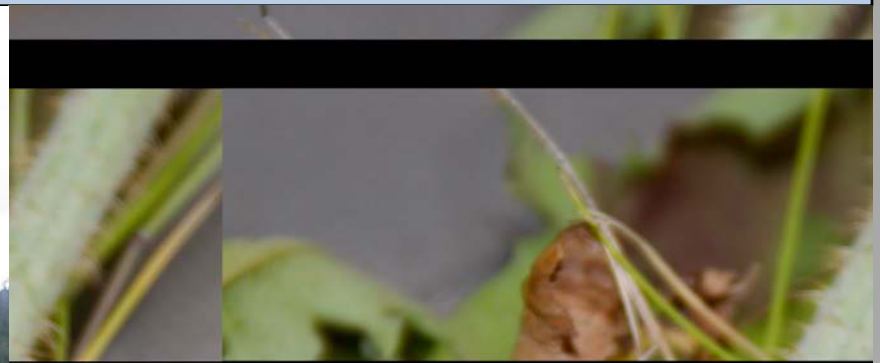
Bradyrrhoa gilveolella – root-boring moth

BIOLOGICAL CONTROL OF

RUSH SKELETONWEED

Bradyrrhoa gilveolella – root-boring moth





BIOLOGICAL CONTROL OF

RUSH SKELETONWEED

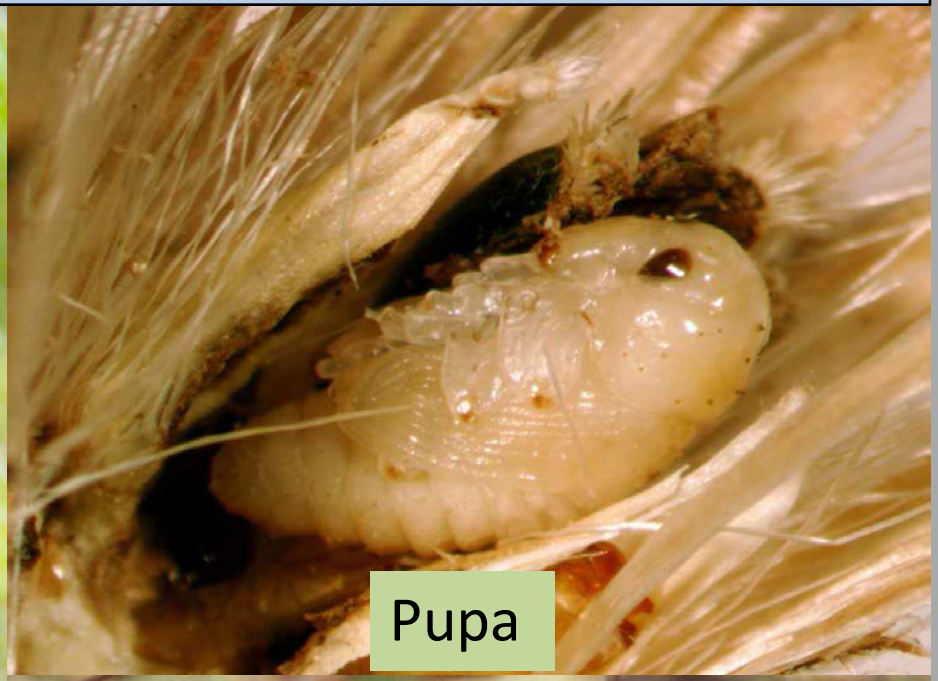
Bradyrrhoa gilveolella – root-boring moth

BIOLOGICAL CONTROL OF
DIFFUSE KNAPWEED
Centaurea diffusa

BIOLOGICAL CONTROL OF

DIFFUSE & SPOTTED KNAPWEED

Larinus minutus– seed head weevil



BIOLOGICAL CONTROL OF

DIFFUSE & SPOTTED KNAPWEED

Larinus minutus– seed head weevil

BIOLOGICAL CONTROL OF

DIFFUSE & SPOTTED KNAPWEED

Larinus minutus– seed head weevil

BIOLOGICAL CONTROL OF

DIFFUSE & SPOTTED KNAPWEED

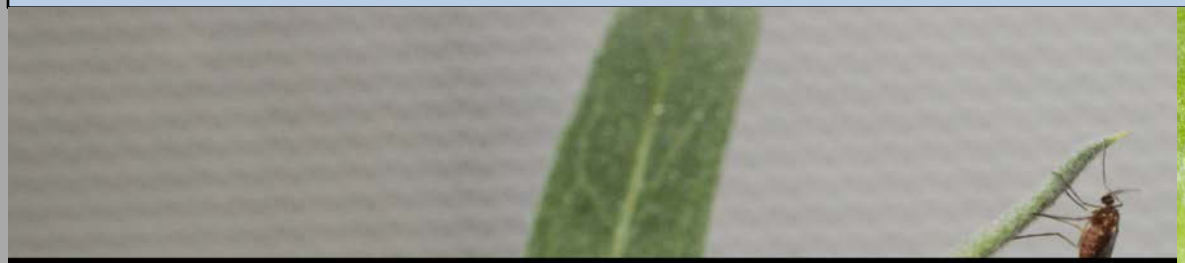
Larinus minutus– seed head weevil

BIOLOGICAL CONTROL OF
RUSSIAN KNAPWEED
Acroptilon repens

BIOLOGICAL CONTROL OF

RUSSIAN KNAPWEED

Jaapiella ivannikovi – bud gall midge



BIOLOGICAL CONTROL OF

RUSSIAN KNAPWEED

Jaapiella ivannikovi – bud gall midge

BIOLOGICAL CONTROL OF

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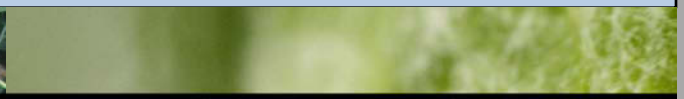


BIOLOGICAL CONTROL OF PURPLE LOOSESTRIFE

Lythrum salicaria

BIOLOGICAL CONTROL OF PURPLE LOOSESTRIFE

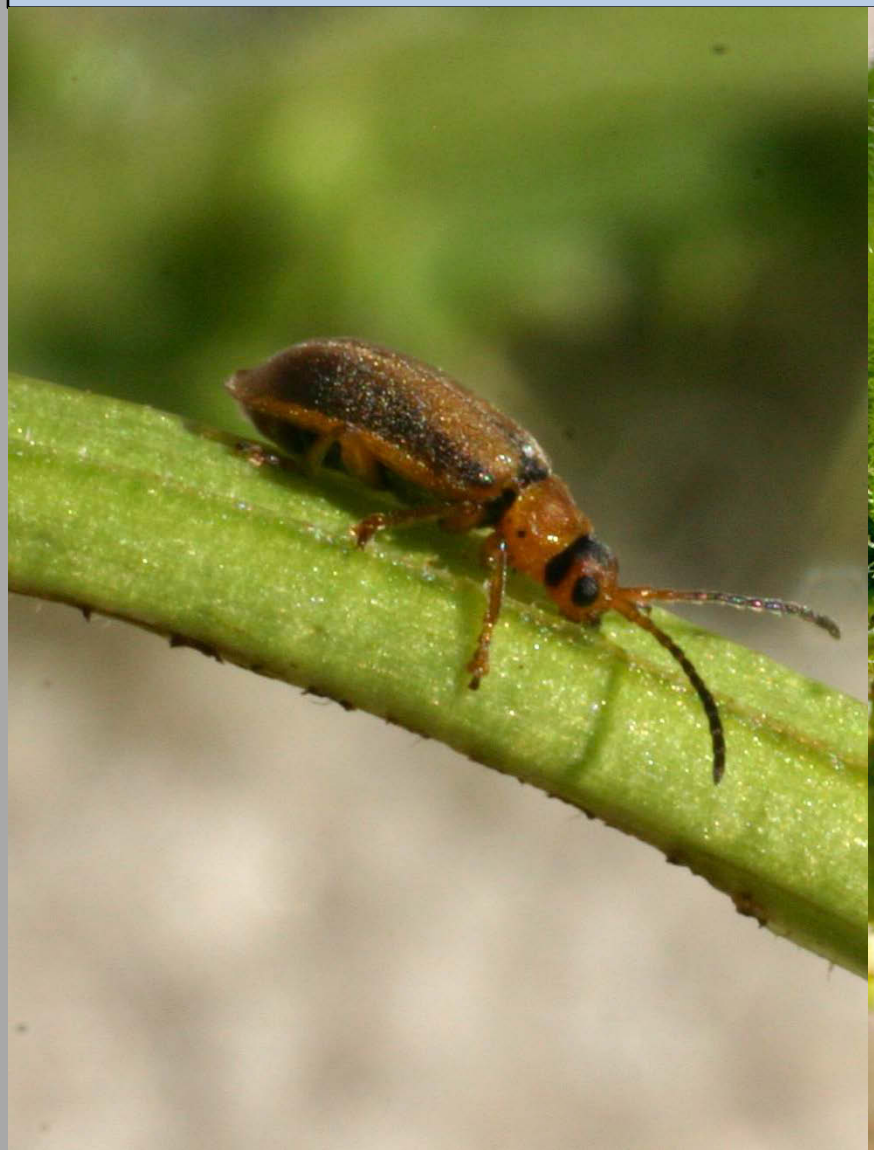
Lythrum salicaria

BIOLOGICAL CONTROL OF
PURPLE LOOSESTRIFE
Lythrum salicaria

BIOLOGICAL CONTROL OF

PURPLE LOOSESTRIFE

Galerucella calmariensis & pusilla leaf beetles



BIOLOGICAL CONTROL OF

PURPLE LOOSESTRIFE

Galerucella pusilla – leaf beetle

BIOLOGICAL CONTROL OF

PURPLE LOOSESTRIFE

Hylobius transversovittatus – root weevil

BIOLOGICAL CONTROL OF

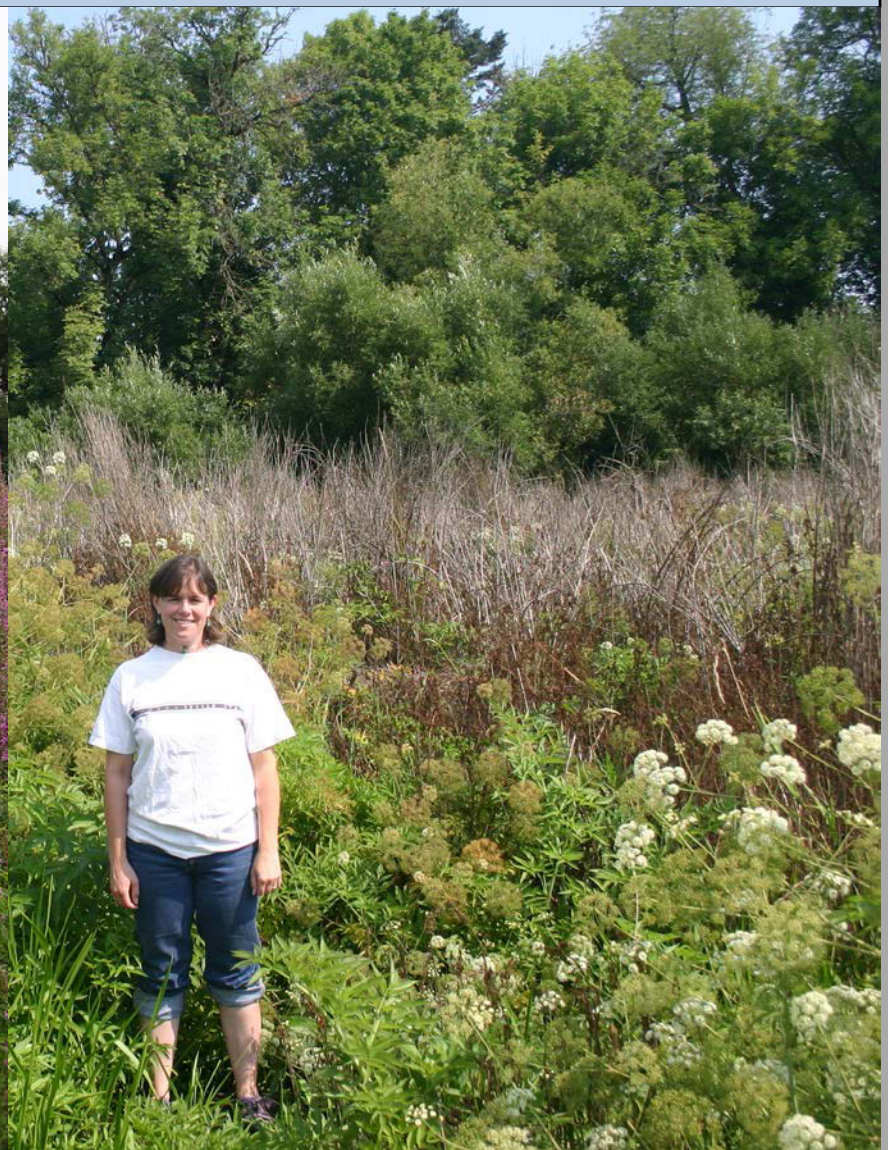
PURPLE LOOSESTRIFE

Nanophyes marmoratus – seed capsule weevil

BIOLOGICAL CONTROL OF

PURPLE LOOSESTRIFE

Galerucella calmariensis & pusilla leaf beetles



BIOLOGICAL CONTROL OF PURPLE LOOSESTRIFE

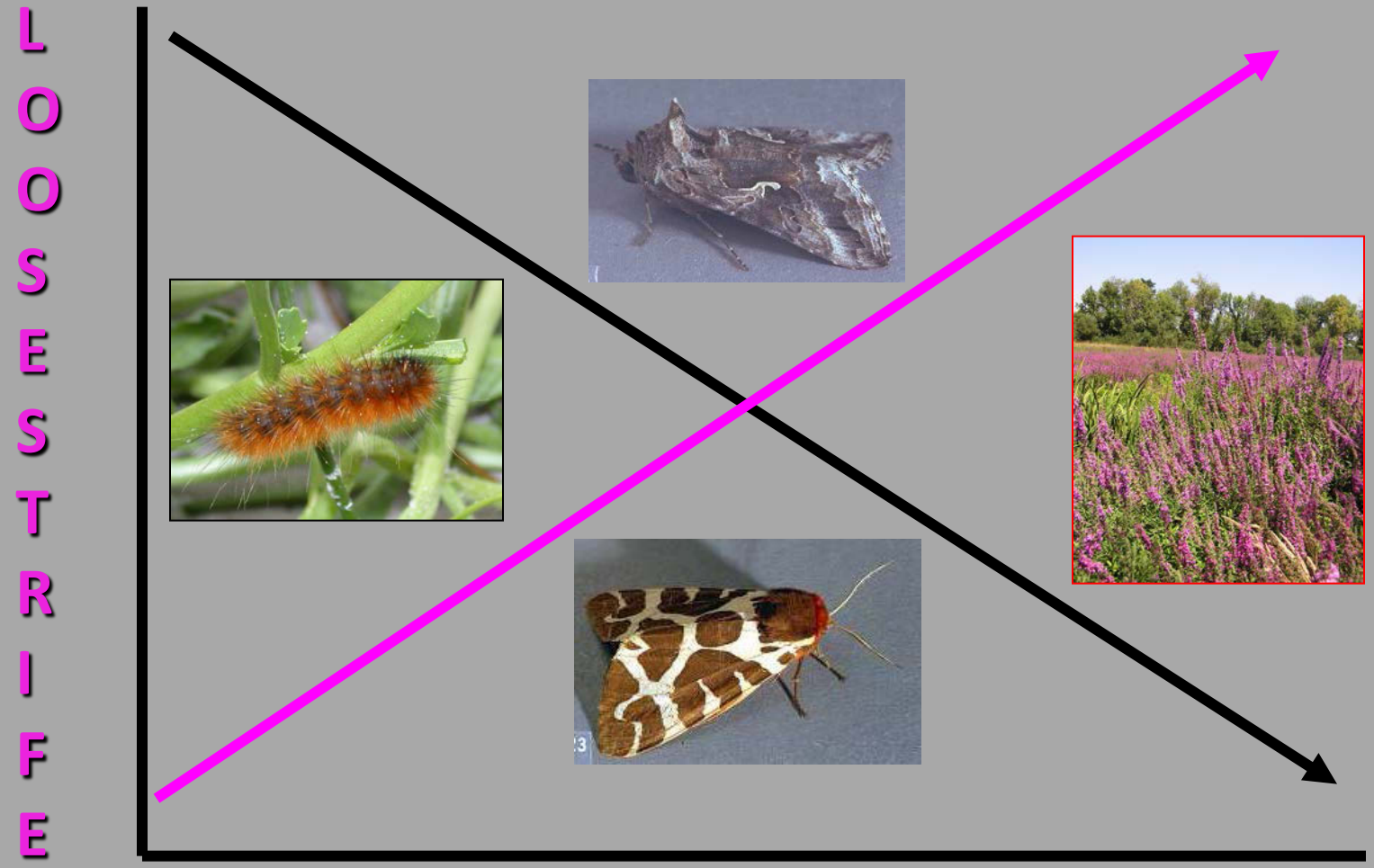
Galerucella calmariensis & pusilla leaf beetles

BIOLOGICAL CONTROL OF PURPLE LOOSESTRIFE

Galerucella calmariensis & pusilla leaf beetles

BIOLOGICAL CONTROL OF PURPLE LOOSESTRIFE

Lythrum salicaria



BIOLOGICAL CONTROL OF SALTCEDAR

Tamarix ramosissima

BIOLOGICAL CONTROL OF

SALTCEDAR

Diorhabda carinulata (elongata) – leaf beetle

BIOLOGICAL CONTROL OF

SALTCEDAR

Diorhabda carinulata (elongata) – leaf beetle

BIOLOGICAL CONTROL OF

SALTCEDAR

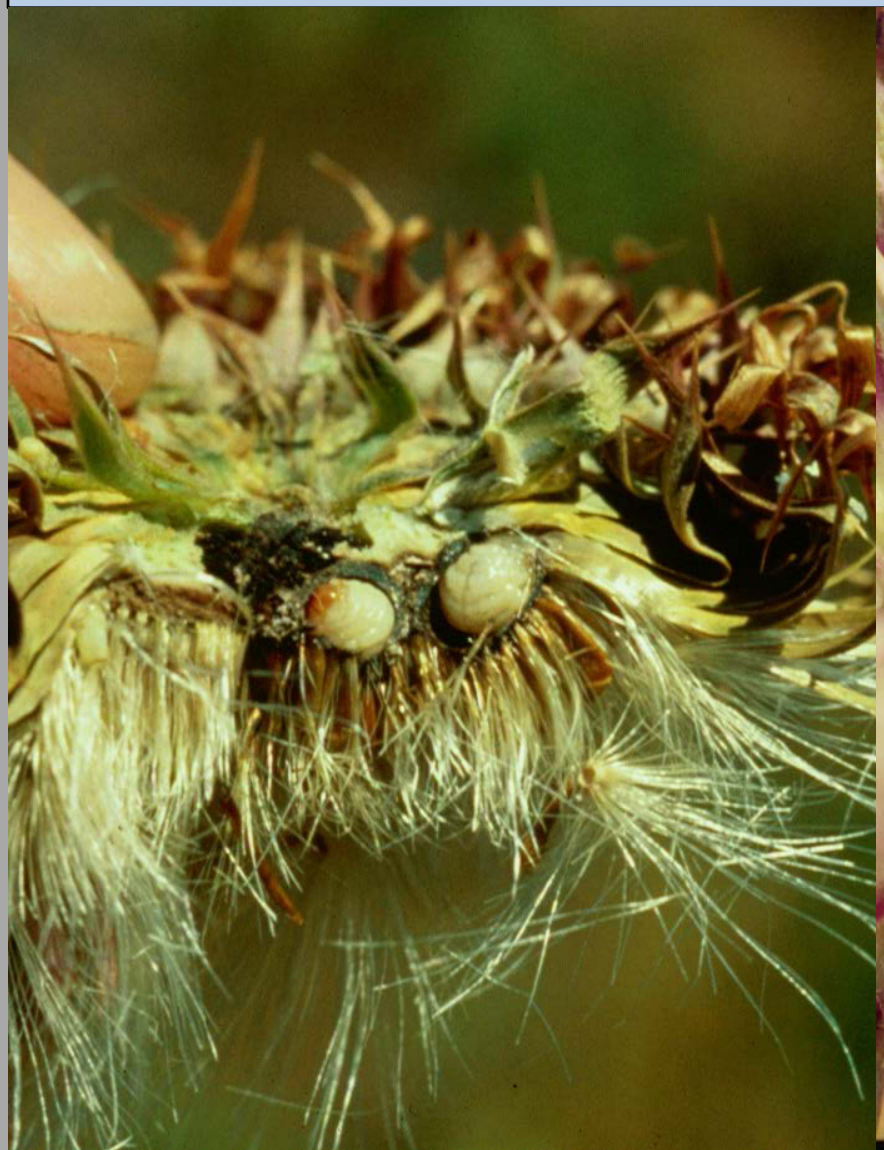
Diorhabda carinulata (elongata) – leaf beetle

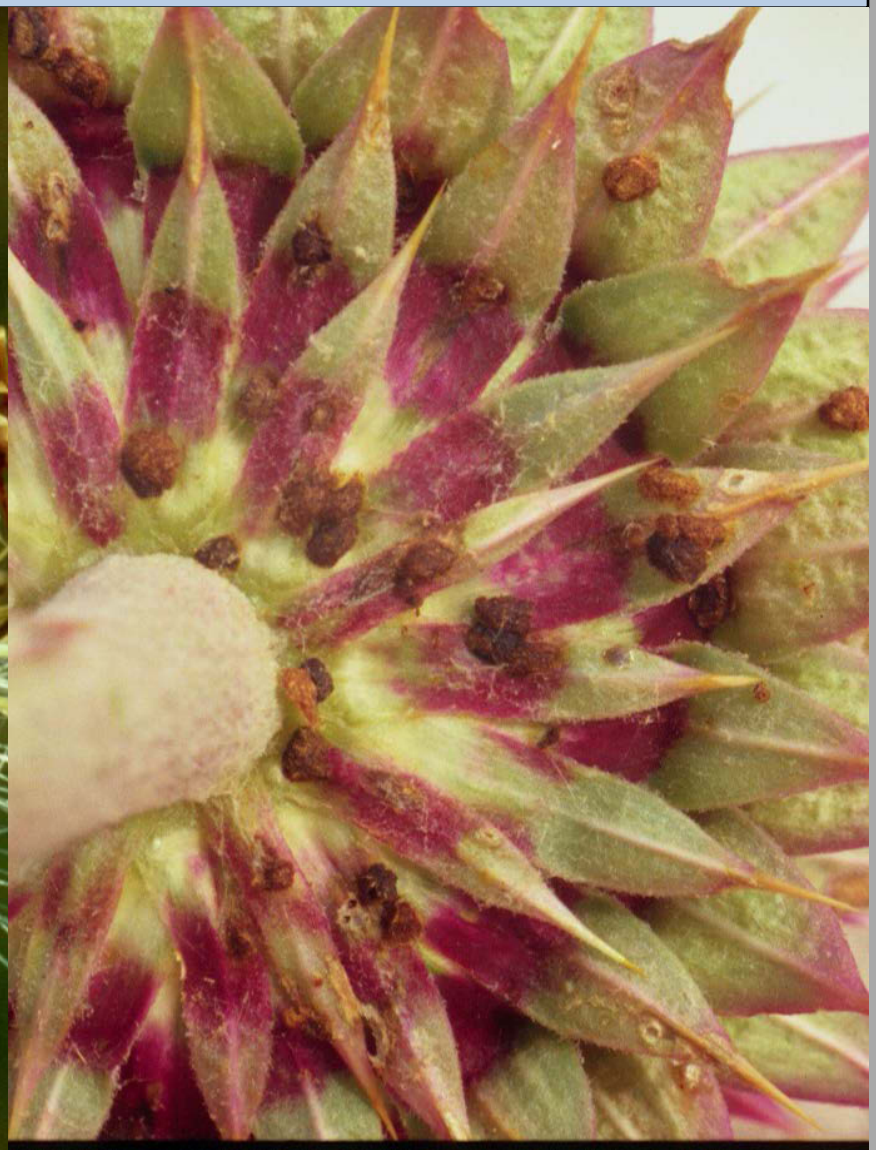
BIOLOGICAL CONTROL OF
MUSK THISTLE
Carduus nutans

BIOLOGICAL CONTROL OF

MUSK THISTLE

Rhinocyllus conicus – seed head weevil

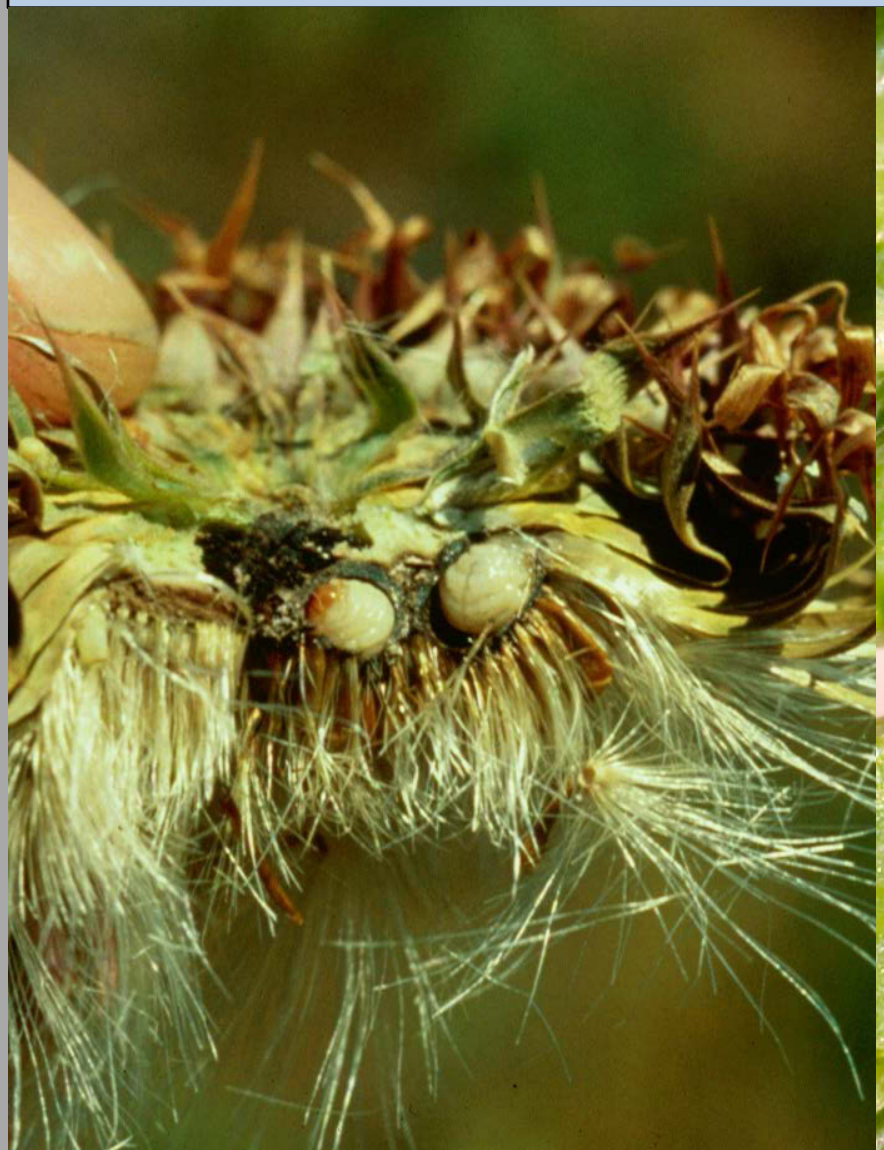




BIOLOGICAL CONTROL OF

MUSK THISTLE

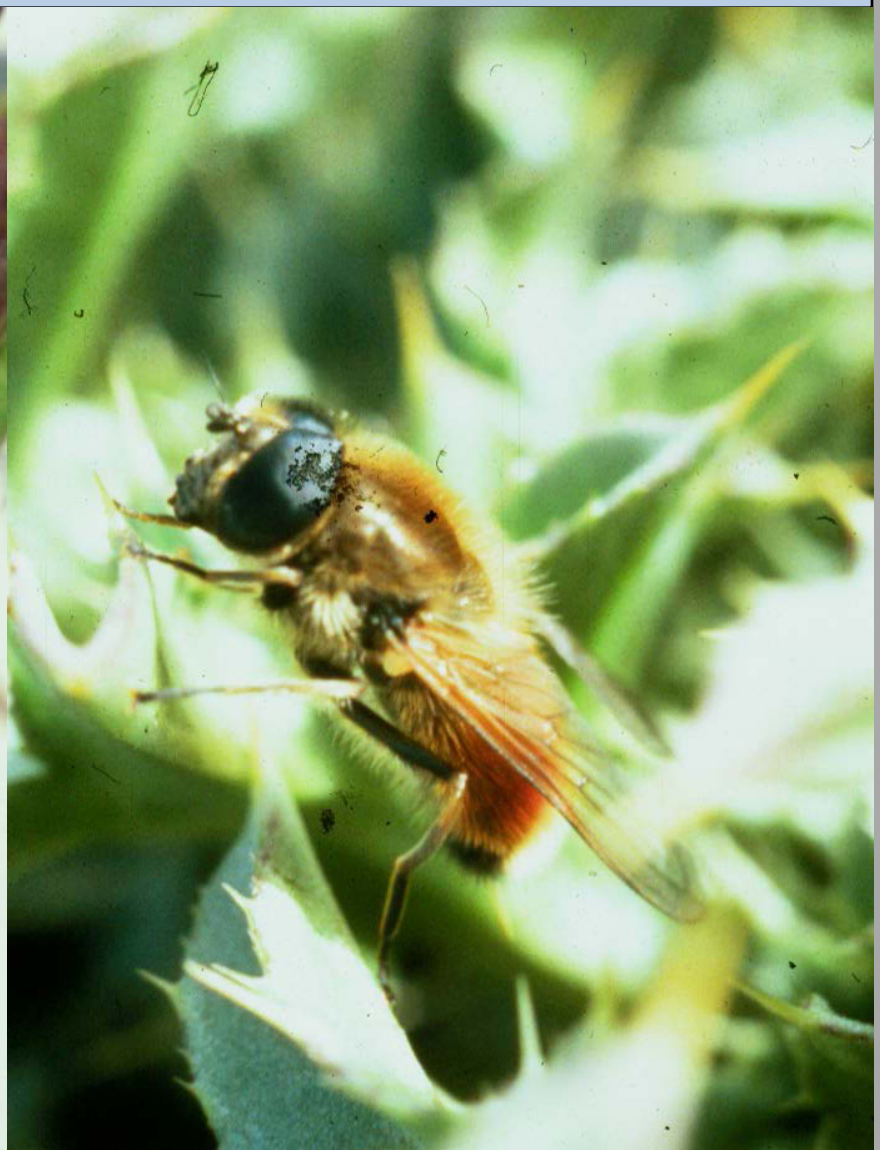
Rhinocyllus conicus – seed head weevil



BIOLOGICAL CONTROL OF

MUSK THISTLE

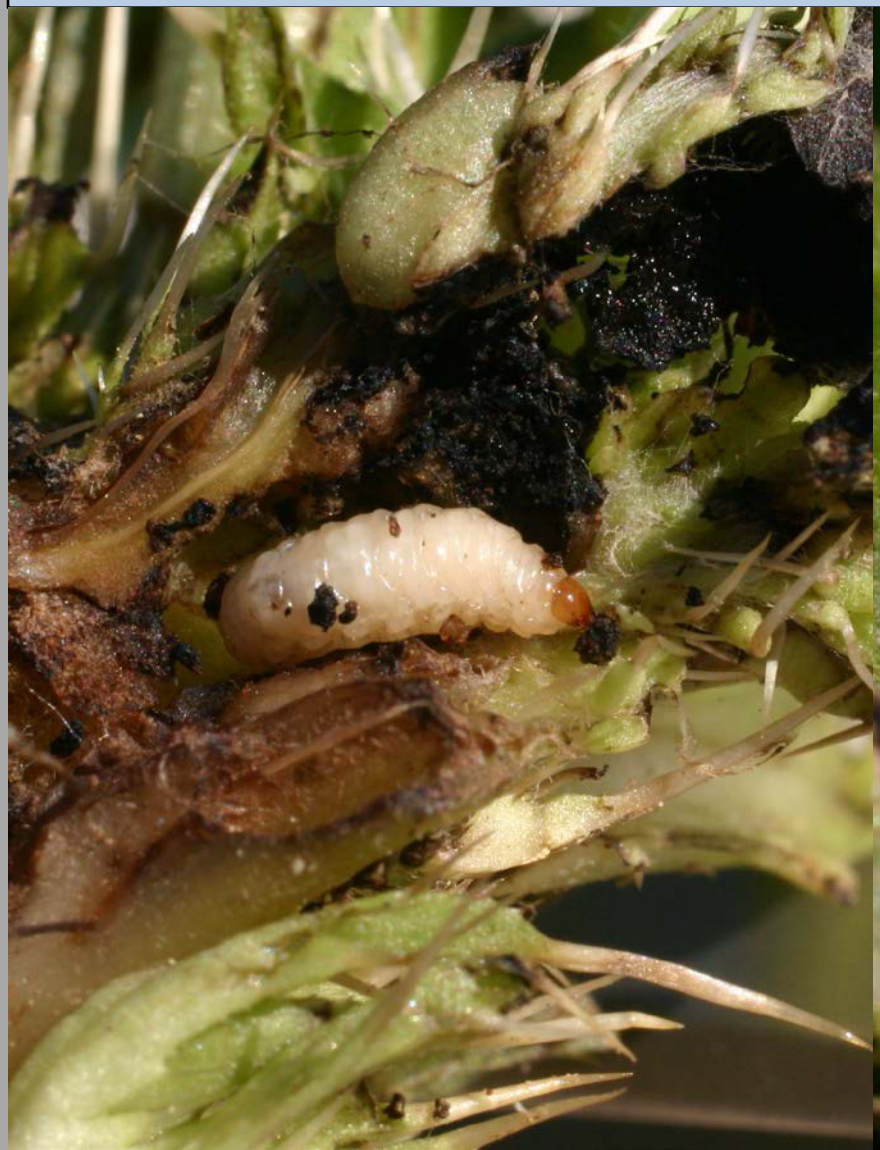
Cheilosia corydon – stem mining fly



BIOLOGICAL CONTROL OF

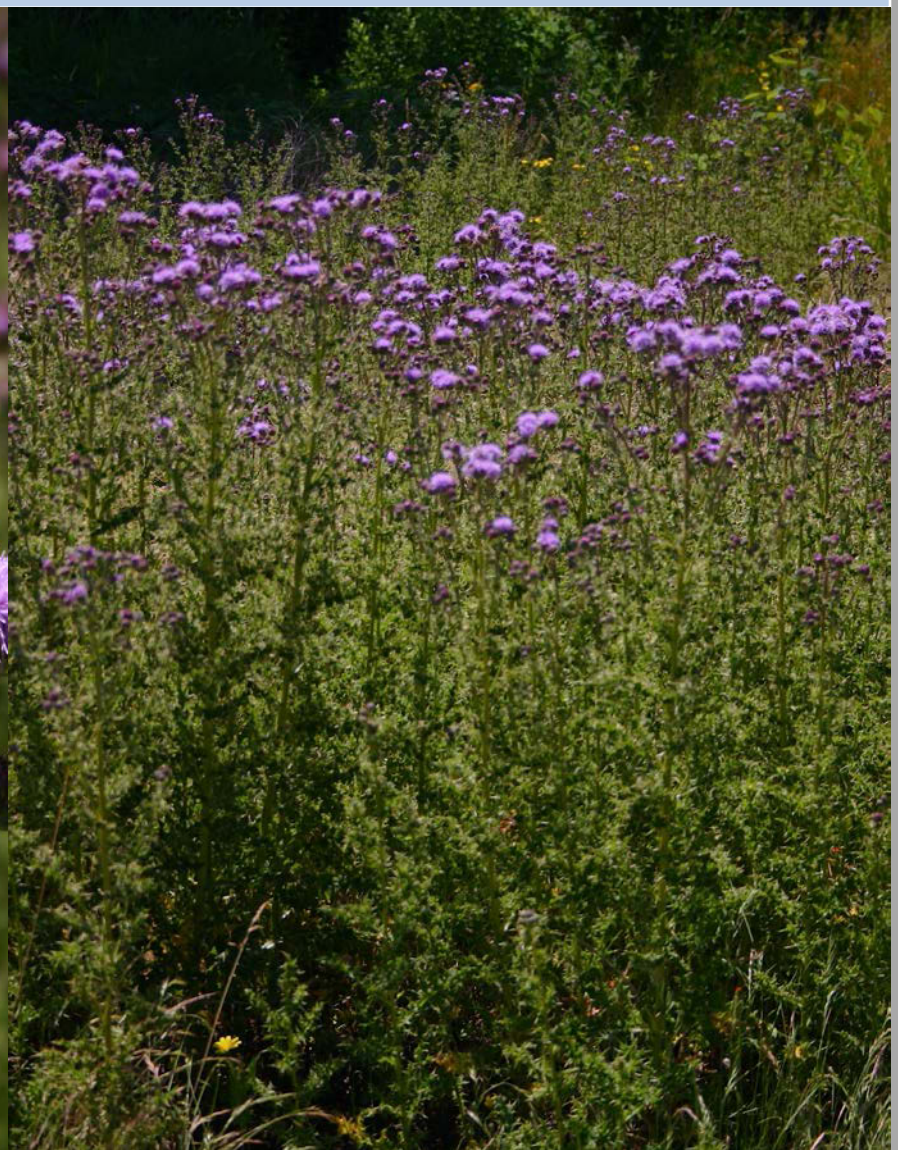
MUSK THISTLE

Trichosirocalus horridus – crown weevil



BIOLOGICAL CONTROL OF CANADA THISTLE

Cirsium arvensis



BIOLOGICAL CONTROL OF CANADA THISTLE

Ceutorhynchus litura – stem mining weevil

BIOLOGICAL CONTROL OF

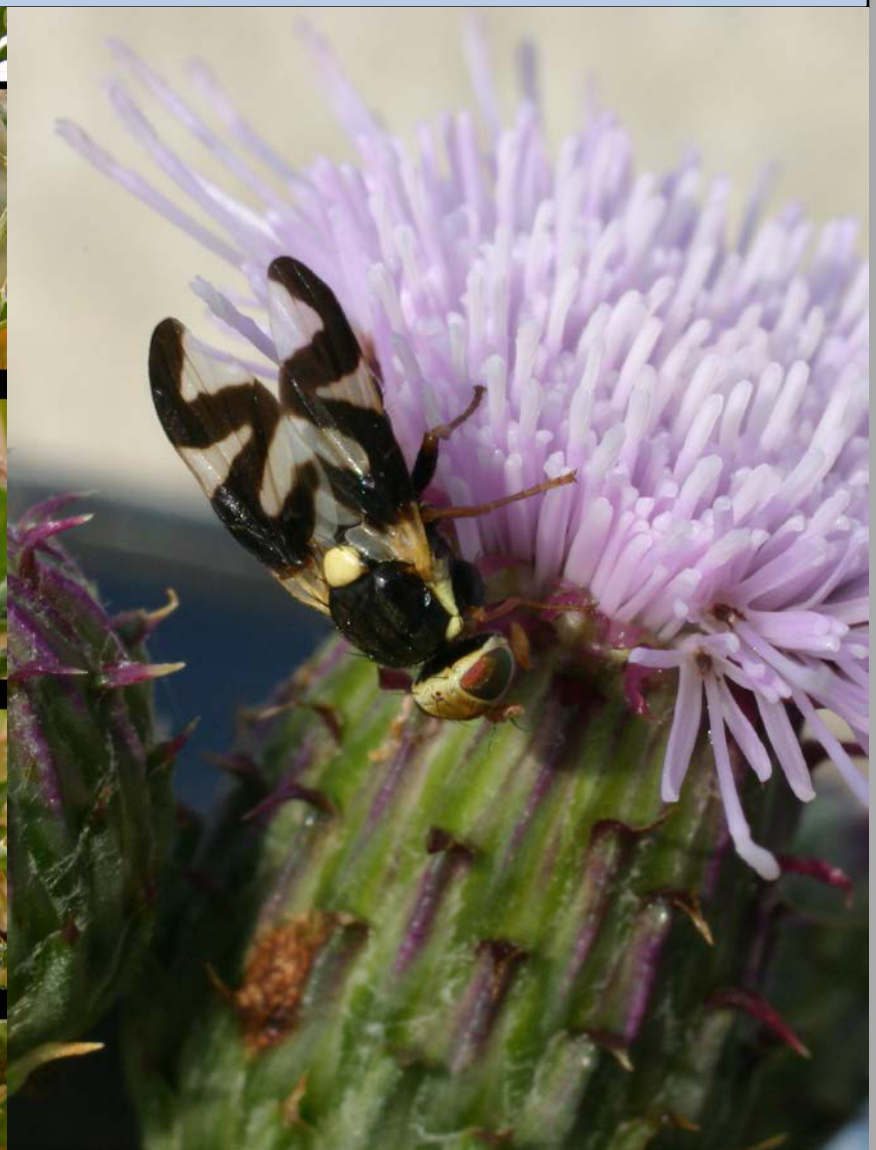
CANADA THISTLE

Ceutorhynchus litura – stem mining weevil

BIOLOGICAL CONTROL OF

CANADA THISTLE

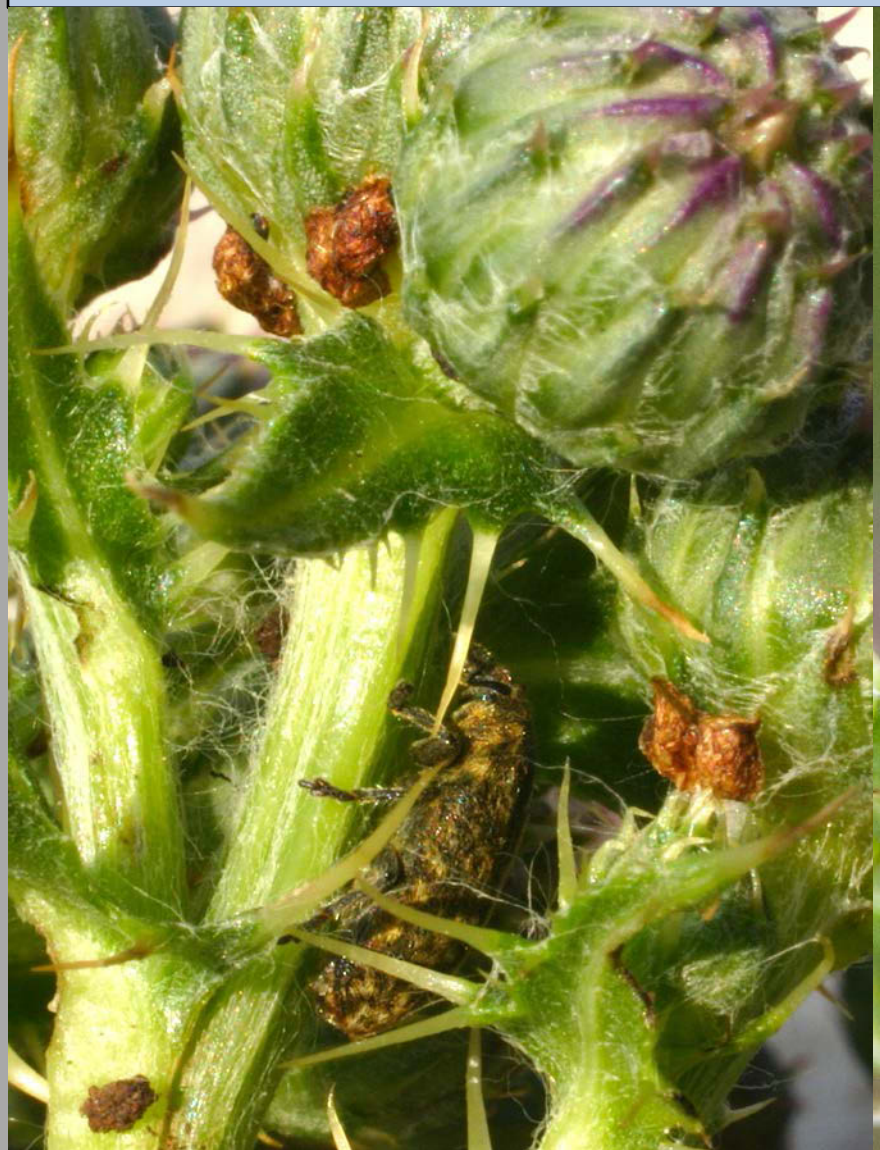
Urophora cardui – stem gall fly



BIOLOGICAL CONTROL OF

CANADA THISTLE

Rhinocyllus conicus – seed head weevil



BIOLOGICAL CONTROL OF DALMATIAN TOADFLAX

Linaria dalmatica (genistifolia)

BIOLOGICAL CONTROL OF

DALMATIAN & YELLOW TOADFLAX

Mecinus janthinus – stem weevil

BIOLOGICAL CONTROL OF

DALMATIAN & YELLOW TOADFLAX

Mecinus janthinus – stem weevil

BIOLOGICAL CONTROL OF

DALMATIAN & YELLOW TOADFLAX

Mecinus janthinus – stem weevil

BIOLOGICAL CONTROL OF
YELLOW STARTHISTLE
Centaurea soltitialis

BIOLOGICAL CONTROL OF YELLOW STARTHISTLE

Centaurea soltitialis

BIOLOGICAL CONTROL OF
YELLOW STARTHISTLE

Eustenopus villosus– seed head weevil

BIOLOGICAL CONTROL OF YELLOW STARTHISTLE

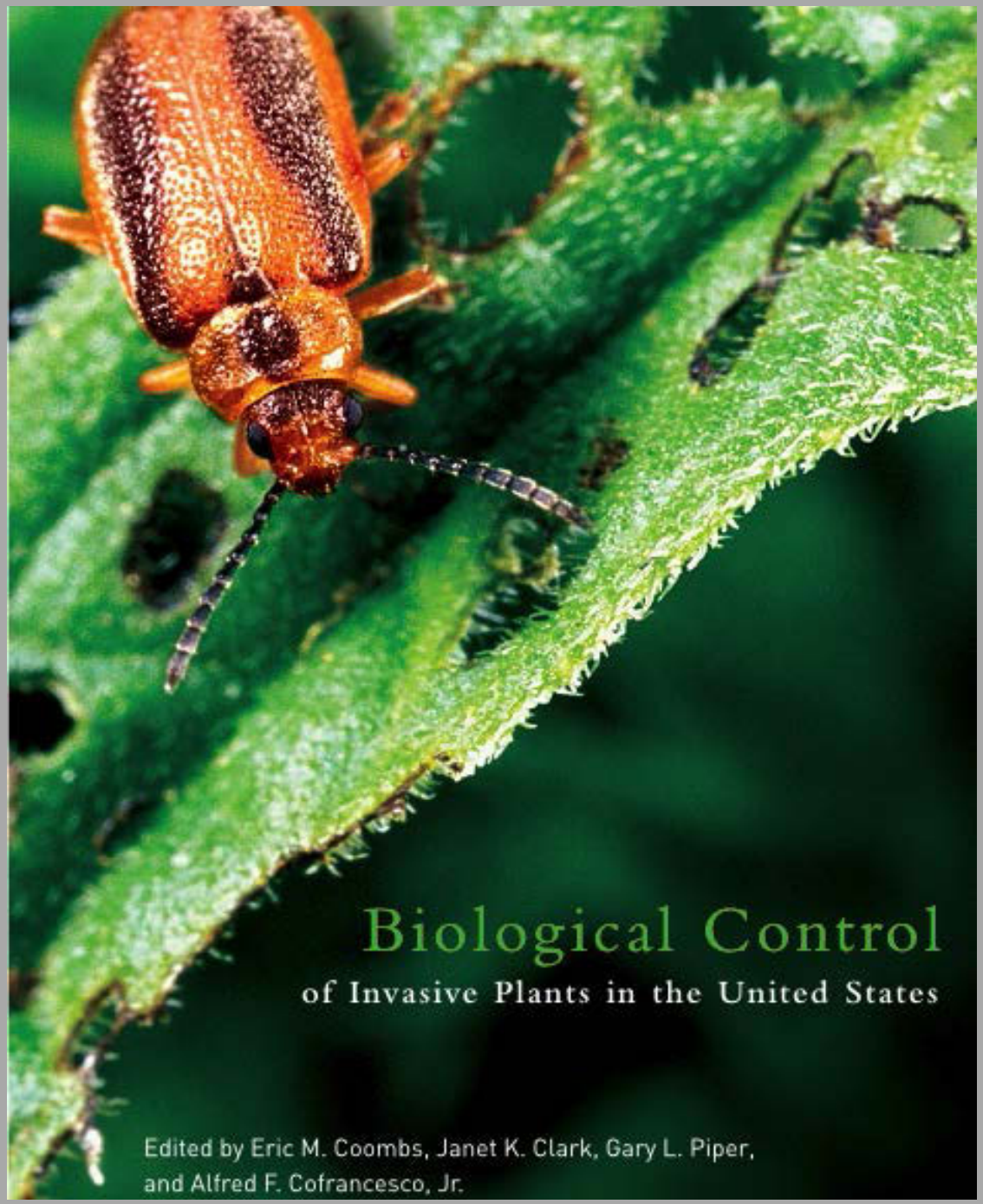
Eustenopus villosus– seed head weevil

BIOLOGICAL CONTROL OF YELLOW STARTHISTLE

Puccinia jacea var. solstitialis – rust fungus

BIOLOGICAL CONTROL OF YELLOW STARTHISTLE

Puccinia jacea var. solstitialis – rust fungus



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Phone: 1-800-426-3797

$45.00 + S&H

In this book, leading experts review the discipline of biological control of invasive terrestrial and aquatic plants.
Topics addressed include ecology, safety testing, nontarget impacts, and the processes of identifying, introducing, distributing, and monitoring biological control agents.

This book also provides information about 39 target plants in the continental United States and 94 agents, including their origin, biology, habitat, impacts, and distribution. The book concludes with information about invasive plants targeted for biological control in the future.


That’s enough BULL for now!!!