

# South Dakota Biological Control



Mike Stenson  
South Dakota Department of Agriculture  
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# SD Biological Control



- ❧ Leafy Spurge
- ❧ Purple Loosestrife
- ❧ Dalmatian Toadflax
- ❧ Yellow Toadflax
- ❧ Poison Hemlock
- ❧ Knapweed Species
- ❧ St. John's Wort
- ❧ Canada Thistle



# Leafy Spurge



## ☞ *Aphthona* species

☞ *A. lacertosa*

☞ Black Flea Beetle

☞ *A. nigriscutis*

☞ Brown Flea  
Beetle



## ☞ *Oberea erythrocephala*

☞ Stem borer

## ☞ *Hyles euphorbiae*

☞ Hawk Moth



# Leafy Spurge



- ❧ Flea Beetles
  - ❧ SD's most successful biocontrol program
  - ❧ Collected in June
  - ❧ Sunny days are best
  - ❧ 3000-5000/release
  
- ❧ Public Collections held across SD





# Purple Loosestrife

- ❧ *Galerucella californiensis* and *G. pusilla*
  - ❧ Defoliating Beetle
- ❧ *Hylobius transversovittatus*
  - ❧ Root feeding weevil



# Purple Loosestrife



- ❧ Widespread on Lower Missouri River
- ❧ Reared by SD/NE PLS Cooperative at Yankton Trustee Unit
- ❧ Niobrara High School
- ❧ Distributed along Missouri and Niobrara Rivers





# Dalmatian Toadflax

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- ❧ *Mecinus janthiniformis*
    - ❧ Stem boring weevil
  - ❧ *Calophasia lanula*
    - ❧ Defoliating moth



# Dalmation Toadflax



- ❧ Very successful in the Black Hills
- ❧ Collected in May and June
- ❧ Skyline Drive
- ❧ Kingswood/New St. Martin's
- ❧ Rapid City Landfill
- ❧ Fort Meade BLM
- ❧ Hot Springs Sites



# Yellow Toadflax

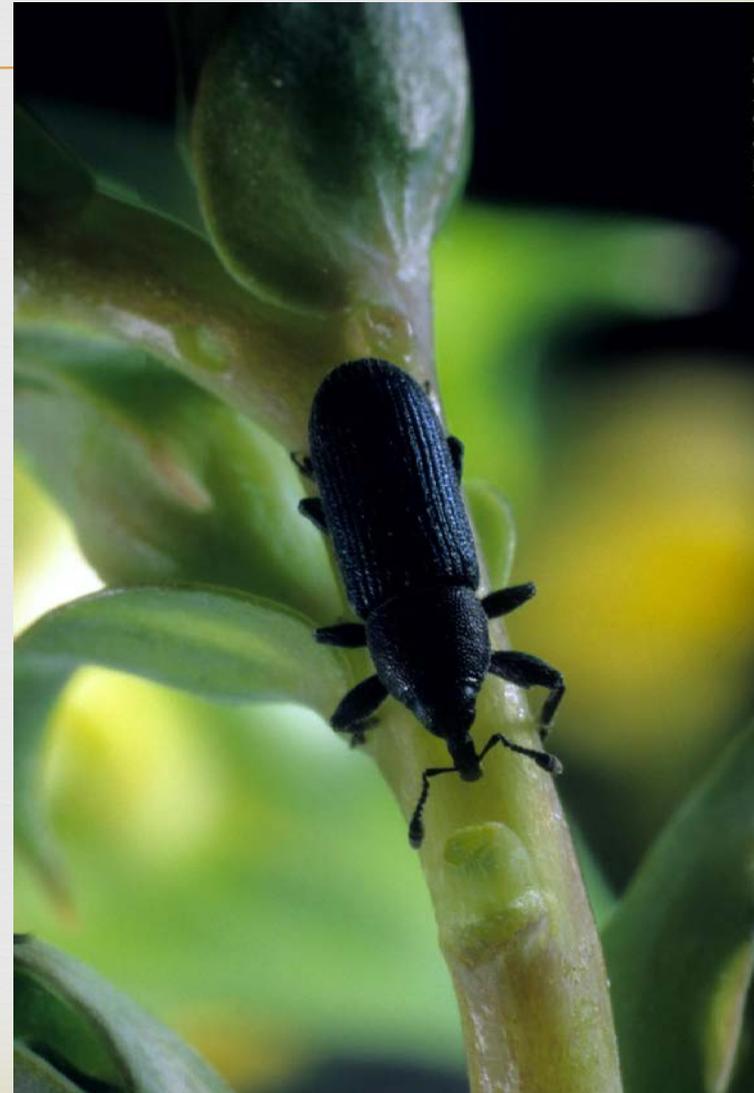
- ❧ *Mecinus janthinus*
  - ❧ Stem mining weevil
  - ❧ Species Confusion
- ❧ *Brachypterolus pulicarius*
  - ❧ Flower feeding beetle
  - ❧ Widely found
- ❧ *Rhinusa linariae*
  - ❧ Root gall weevil
  - ❧ Widely found



# Yellow Toadflax



- ❧ Early Stages
- ❧ Edmunds/McPherson Counties
  - ❧ USFWS
  - ❧ TNC
  - ❧ Private Lands
- ❧ Black Hills
  - ❧ USFS (2017)
  - ❧ Carol Randal Workshop
- ❧ Continuing Effort





# Poison Hemlock



- ❧ *Agonopterix alstroemeriana*
  - ❧ Defoliating Moth
- ❧ Early establishment is better than expected



# Poison Hemlock



- ❧ Hamlin County
  - ❧ Released in 2015
- ❧ SDWP Commission Grant
  - ❧ Butte, Meade, Pennington, Fall River, Codington, Hamlin, Deuel
  - ❧ Released in 2016 & 2017





# Knapweed Species



- ❧ *Larinus* species
  - ❧ Seed head weevil
- ❧ *Cyphocleonus achates*
  - ❧ Root Weevil



# Knapweed Species



- ❧ Several established sites in South Central SD
  - ❧ Tripp & Todd County
  - ❧ BIA Sites
- ❧ USFS Releases
  - ❧ Vanocker Canyon 2015
  - ❧ Additional Releases 2016 & 2017
- ❧ Cyphocleonus releases planned for 2018





# St. John's Wort



- ❧ *Chrysolina quadrigemina*
  - ❧ Klamath Beetle
  - ❧ Defoliating Beetle
- ❧ Initial releases in 1944 in Northern California
  - ❧ Reduced populations by 99% by 1957



# St. John's Wort



- ❧ Releases done in 1990s
- ❧ Somewhat widespread in the Northern Black Hills
- ❧ Effectiveness?
- ❧ Potential BLM and USFS sites



# Canada Thistle



- ❧ *Ceutorhynchus litura*
  - ❧ Stem mining weevil
  - ❧ Collect in April or September
  - ❧ Establishment is Difficult
- ❧ *Urophora cardui*
  - ❧ Gall Fly
  - ❧ Collect adults NOT galls
  - ❧ Essentially cosmopolitan
- ❧ Effectiveness???



# Canada Thistle



- ❧ Difficult establishment
- ❧ Difficult collection
- ❧ Unknown impacts
  
- ❧ Not the answer, but a tool in the IPM toolbox.



# Questions?



Mike Stenson

SDDA

605-280-7920

[mike.stenson@state.sd.us](mailto:mike.stenson@state.sd.us)