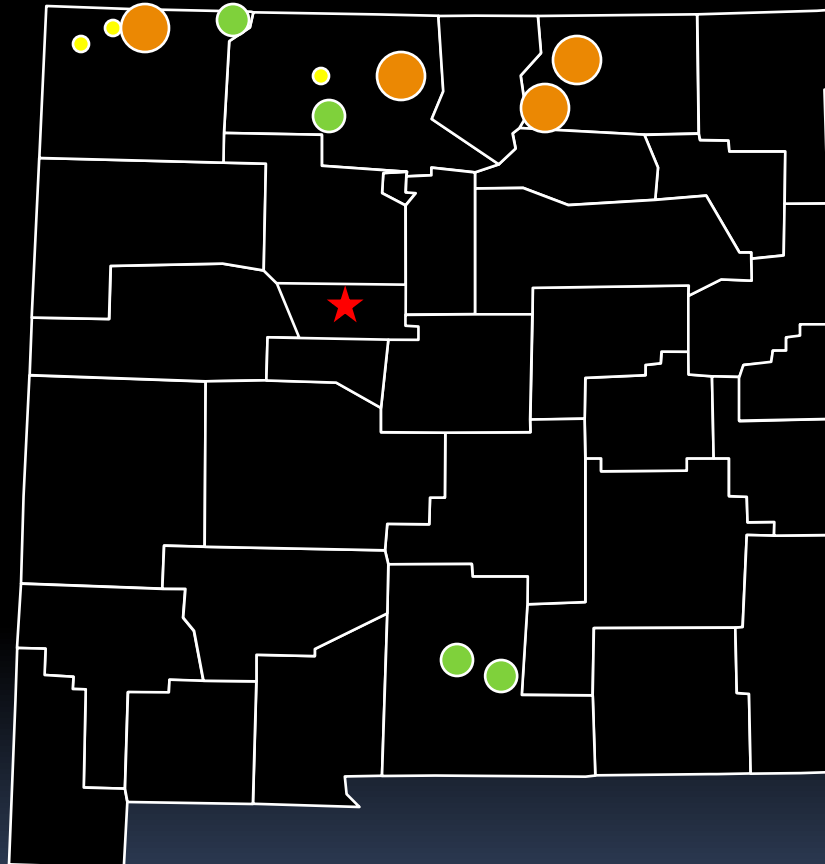


# Leafy Spurge and Musk Thistle Biological Control in New Mexico

Kevin T. Gardner, David C. Thompson and Debra A. Guenther  
New Mexico State University  
Department of Entomology, Plant Pathology, and Weed Science  
Las Cruces, NM



# 1997 Leafy Spurge Populations in New Mexico



• < 0.5 acres

● 0.5 – 5 acres

● > 5 acres

★ Albuquerque

# Leafy Spurge Biological Control Agents

*Aphthona nigriscutis*

*Aphthona lacertosa*



Larvae feed in the roots





160 beetles/m<sup>2</sup> provided:

- 95% control in 1 year on open upland areas.
- 10 years post treatment control remains > 95%

2008





# Musk Thistle: *Carduus nutans*





# *Rhinocyllus conicus*

- Released as a biological control agent in 1969 for musk thistle
- **Known to feed on native thistles at the time of release**
- Never permitted in New Mexico by APHIS



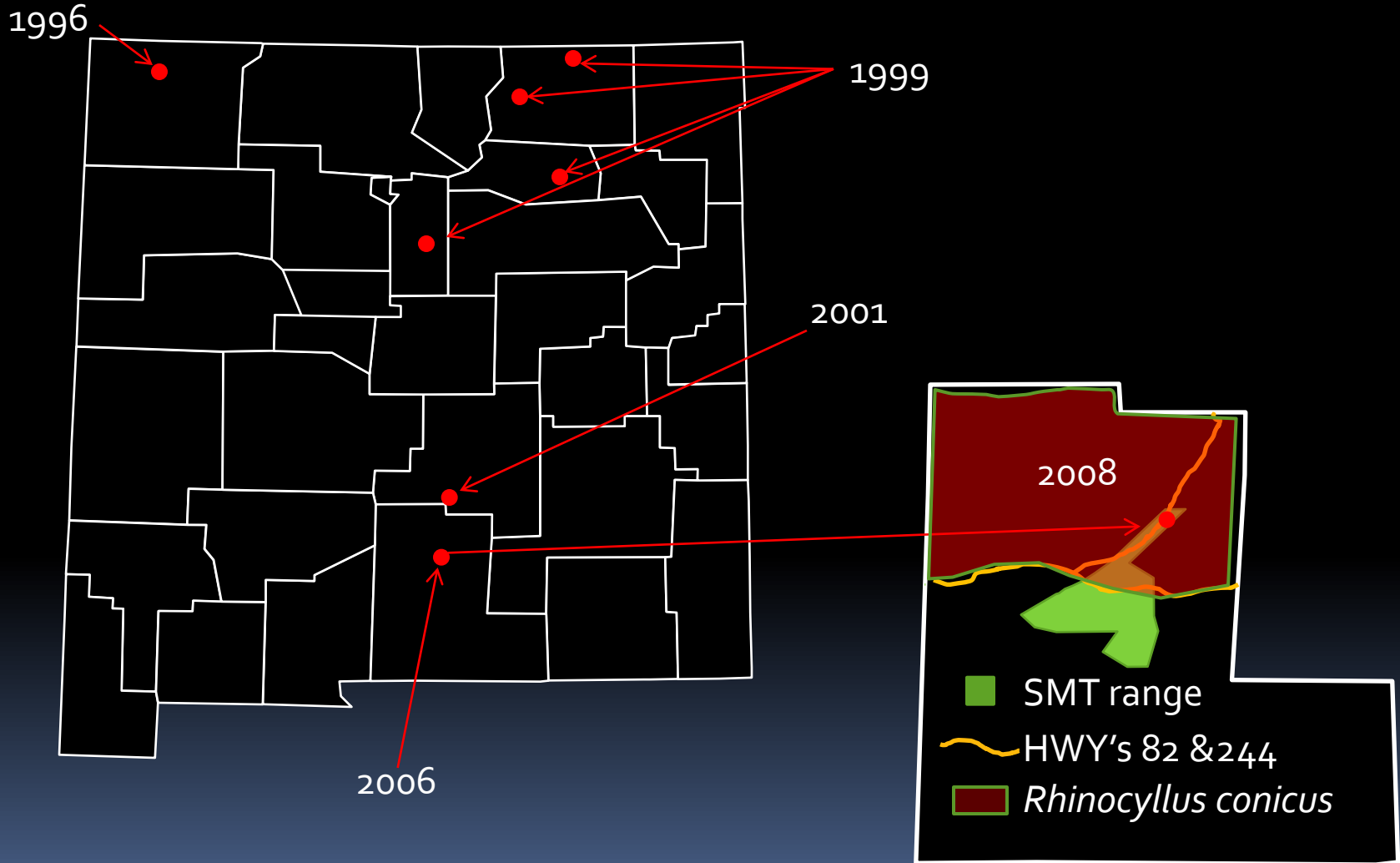


# Typical musk thistle control with *Rhinocyllus*

- Extremely effective agent
- Has removed musk thistle from several State's noxious weeds lists!



# Rhinocyllus survey



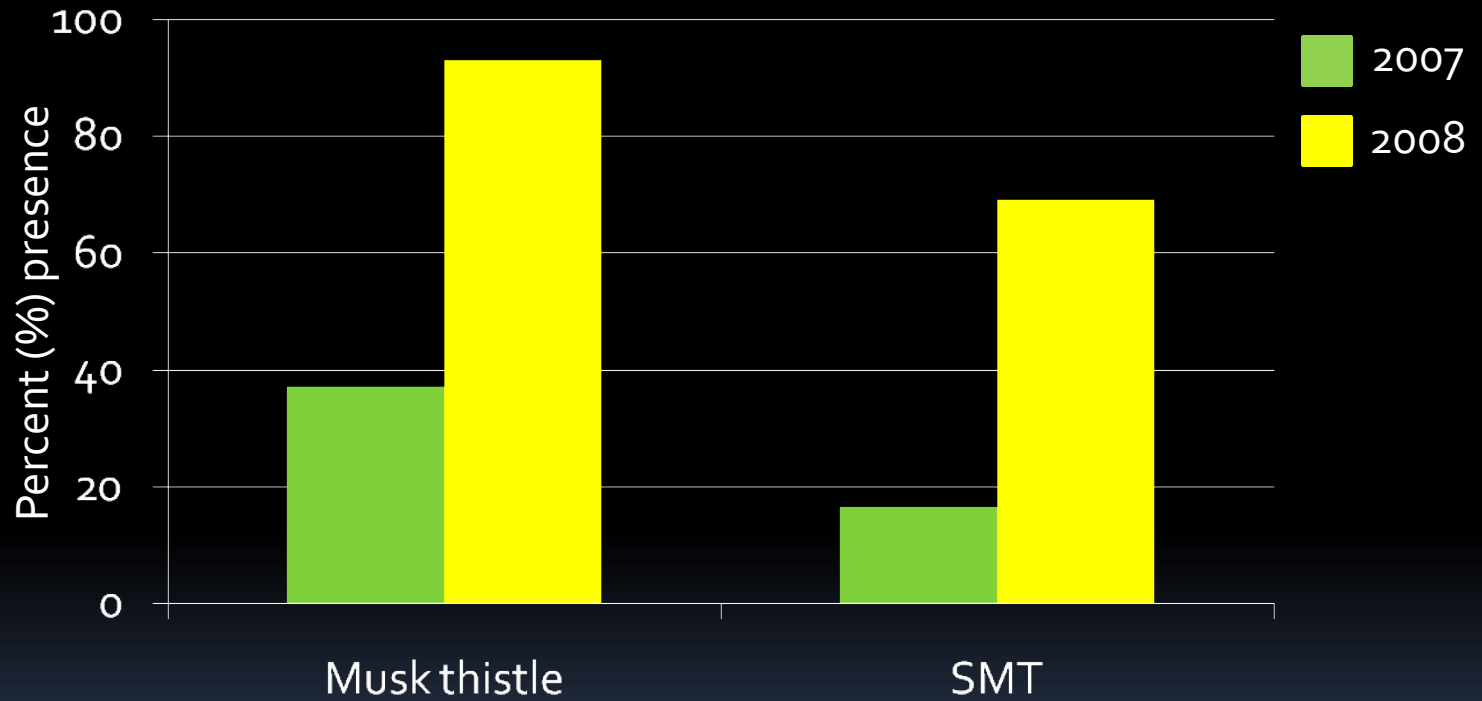


# Sacramento Mountains Thistle: *Cirsium vinaceum*

- Native thistle
- Endemic only to Sacramento Mountains in NM
- Endangered species



## Silver Springs *Rhinocyllus* Presence



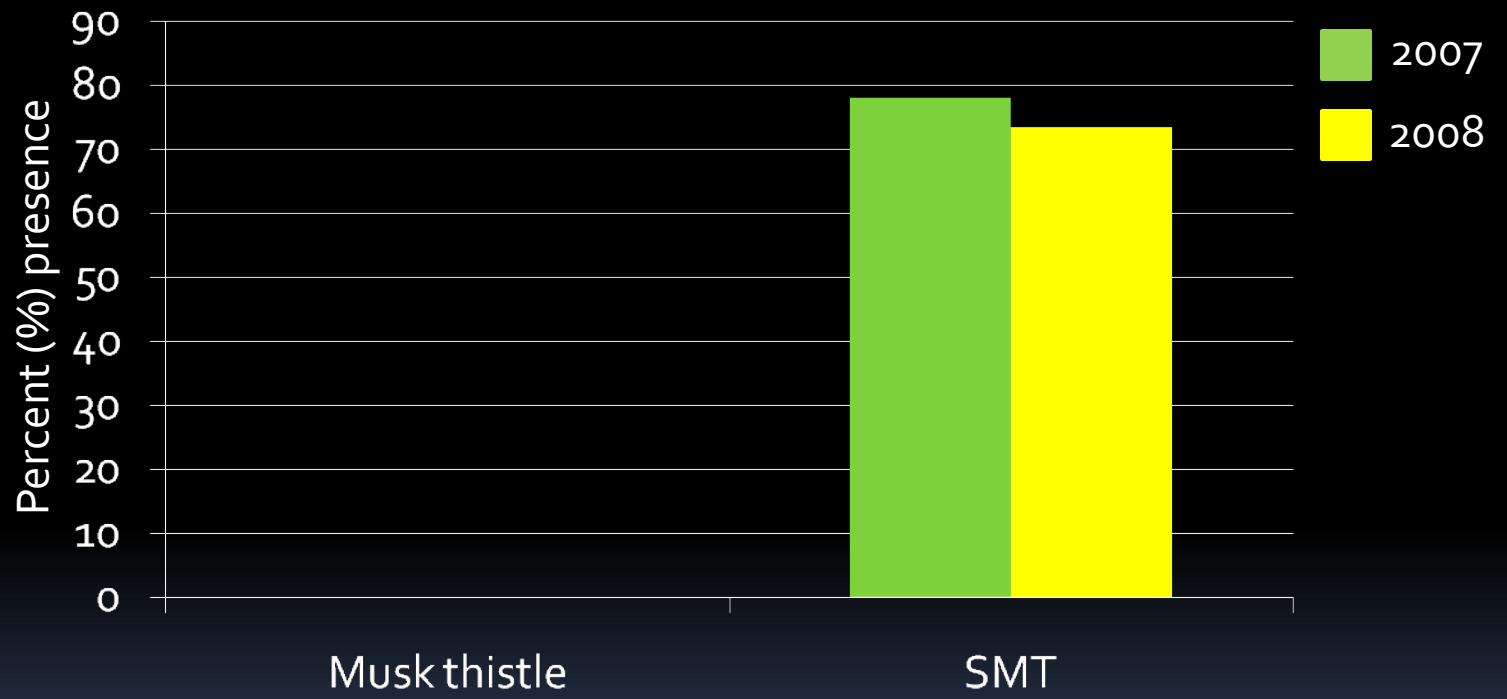


# *Lixus pervestitus*

- Native thistle stem boring weevil
- Not found in SMT or above 5,000 ft elevation until 2006

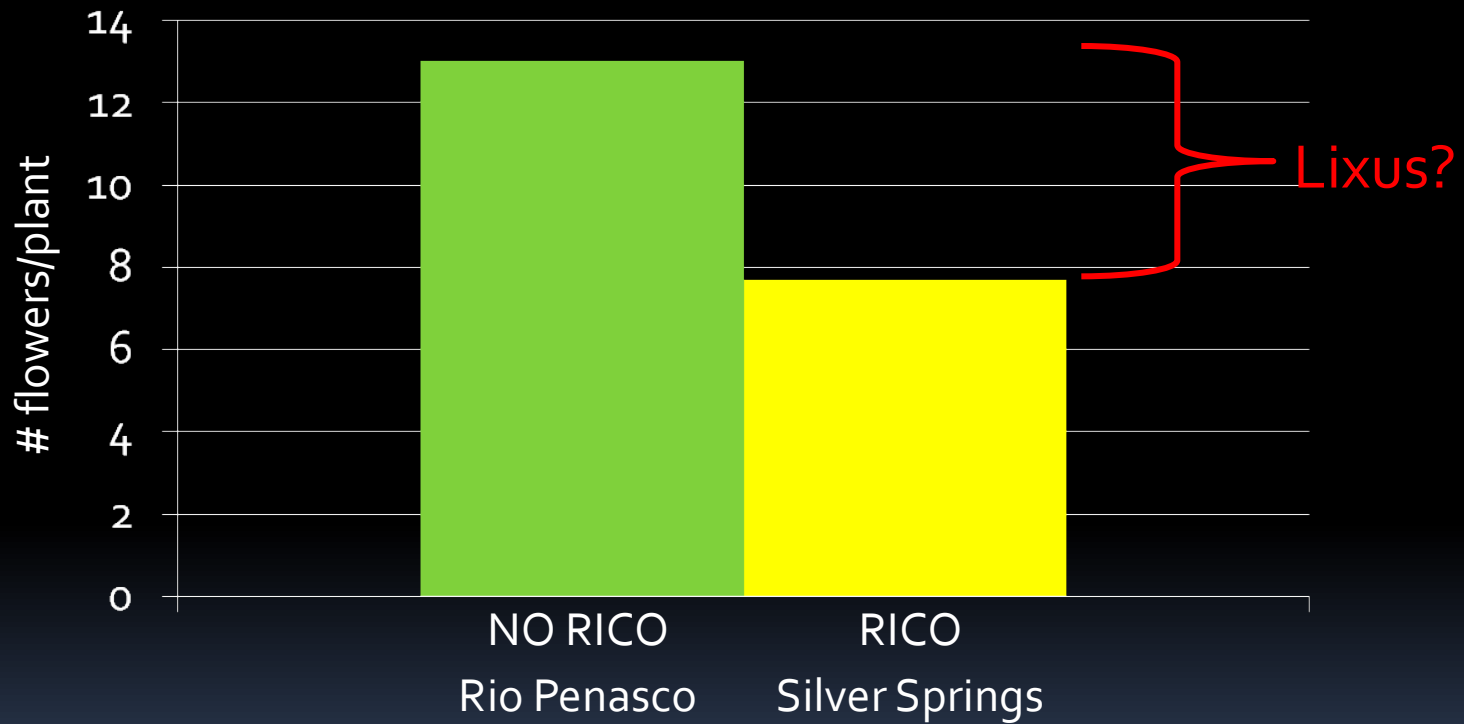


# Silver Springs *Lixus* Presence

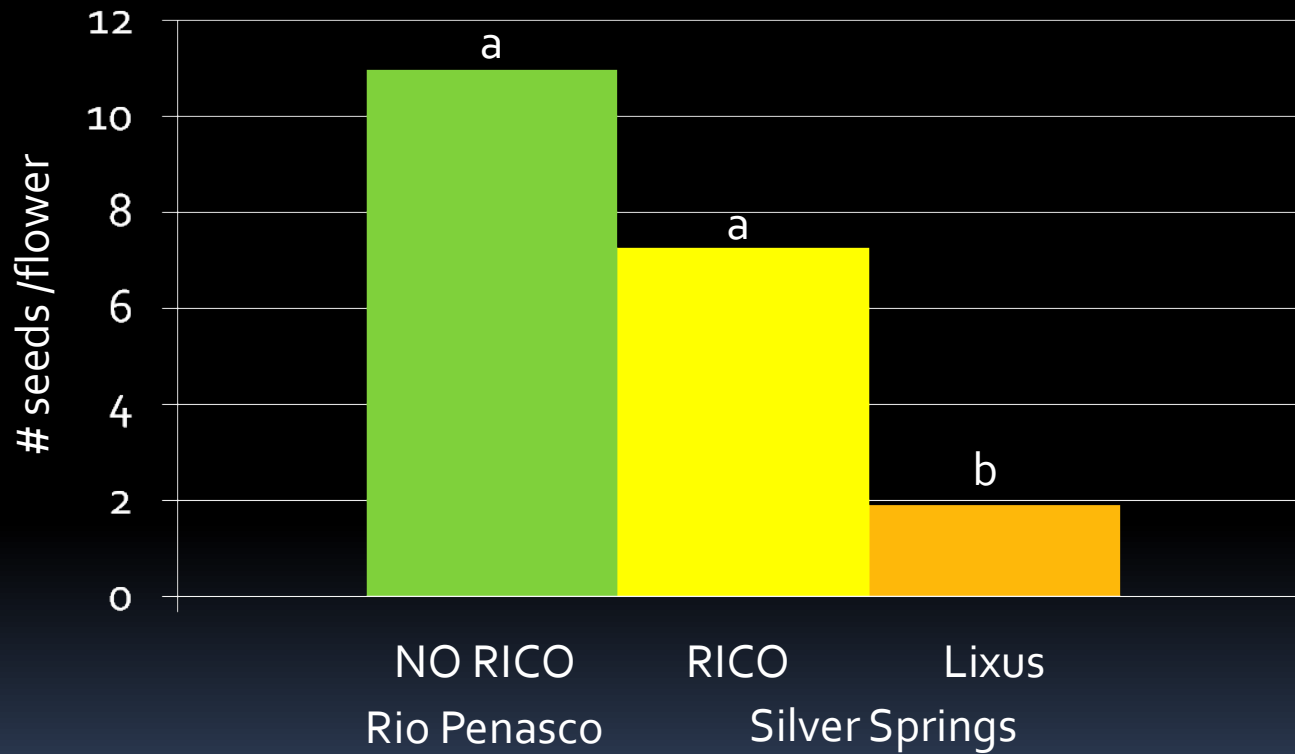




# Sacramento Mountain Thistle Flower Production Comparisons



# Sacramento Mountain Thistle Seed Production Comparisons





# Other Native Insects Impacting SMT

Tephritidae: *Paracantha gentilis*

- Seed galling fly
- Very common in all SMT populations
- Densities of 10 per flower = zero mature seeds



# Other Native Insects Impacting SMT

Curculionid : currently unidentified

- Common in most SMT populations
- Impacts not yet established



# Conclusions

## Leafy spurge biological control of leafy spurge in NM:

- Has been very successful.
- All known populations have been reduced by *Aphthona* beetles.
- Many population have been eradicated using IPM following initial reductions by biological control.

## Musk thistle biological control in NM:

- Although unintentional, most populations are being reduced.
- *Rhinocyllus conicus* currently only occupies the Silver Springs SMT population.
- *Lixus pervestitius* reduces flower and seed production by whole plant mortality.
- As a whole, native insects reduce sexual reproduction more than *Rhinocyllus conicus* alone.





Questions/Comments?