

# Alternative Pollinators

Cory A. Vorel  
Extension CAPS Coordinator



# “Alternative” vs. “Native” Pollinators

Alternative =  
any pollinator that is not  
typically used

Native =  
any pollinator that occurs  
naturally in the area



# Why do we need alternative pollinators?

- Maximize pollination
  - Native bees pollinate many crops more effectively than honey bees.
  - Many native bees forage earlier or later in the day.
  - Native bees often forage in wet or cold conditions.
  - Native bees are likely to move between rows (cross-pollination) and they prompt honey bees to do the same.
- Honey bee health issues
- Avoid dependence on a single species
  - Having multiple pollinators provides “crop insurance.”



# Pollination by Native Bees

- \$3 billion (of \$20 billion) worth of pollination services in 2000 (from *Farming for Bees* - [www.Xerces.org](http://www.Xerces.org))
- ~4000 species of native bees in North America
  - 900 species in Utah
- Mostly solitary
  - Exceptions are bumble bees and some sweat bees



# Managed Alternative Pollinators

- Examples from the family Megachilidae
  - blue orchard bee (*Osmia lignaria*)
  - alfalfa leafcutting bee (*Megachile rotundata*)
  - Spanish mason bee (*Osmia cornuta*)
  - Japanese hornfaced bee (*Osmia cornifrons*)
- Other examples
  - bumble bees (*Bombus impatiens*, *Bombus terrestris*)
  - alkali bee (*Nomia melanderi*)



Heather Hines, NCSU



# Family Megachilidae

- Solitary
- Gregarious
- Scopa on abdomen
- Cavity or ground nesting
  - Nests are a linear series of cells



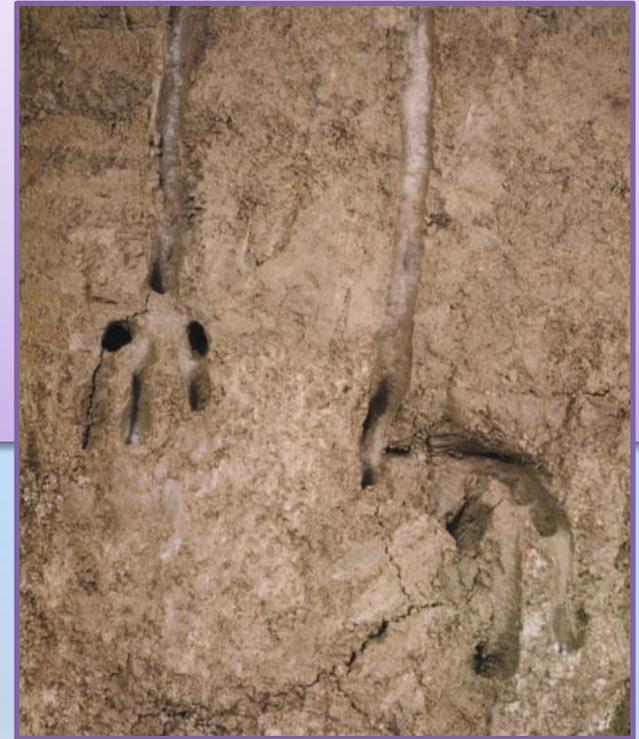
# Family Megachilidae

- Solitary
- Gregarious
- Scopa on abdomen
- Cavity or ground nesting
  - Nests are a linear series of cells



# Family Megachilidae

- Solitary
- Gregarious
- Scopa on abdomen
- Cavity or ground nesting
  - Nests are a linear series of cells



# Blue Orchard Bee

*Osmia lignaria*



# Alfalfa Leafcutting Bee

*Megachile rotundata*



# Bee Biology by the Seasons

Adults in Cocoons



Winter



Prepupae in Cocoons

Adult Emergence  
Offspring Production  
Offspring Development



Spring



Prepupae in Cocoons

Develop to Adult



Summer



Develop to Adult  
Adult Emergence  
Offspring Production  
Offspring Development

Adults in Cocoons



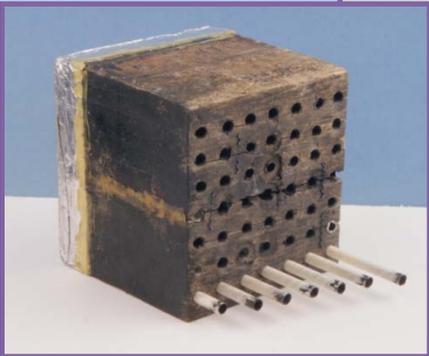
Fall



Prepupae in Cocoons

# Nesting Materials

Blue Orchard Bee



Alfalfa Leafcutting Bee



# Nest Shelters

Blue Orchard Bee

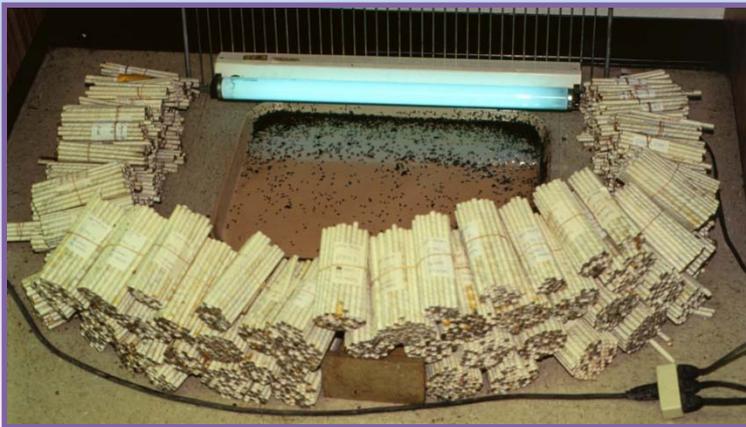


Alfalfa Leafcutting Bee



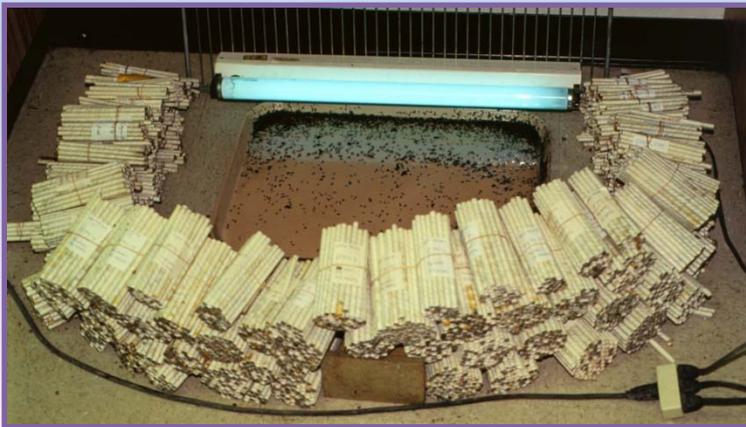
# Managing Blue Orchard Bee Populations

- Keep bees in a cool, dry place during winter.
- Place bees in orchard about 3 days before emergence is desired.
- When bloom and nesting subside, store nests in a dry place.
- While overwintering, remove parasites and diseased & dead larvae.



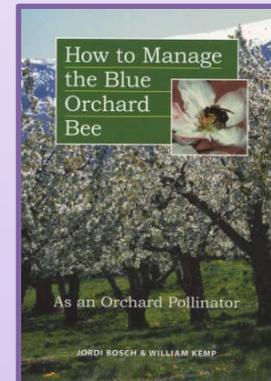
# Managing Alfalfa Leafcutting Bee Populations

- Keep bees in a cool, dry place during winter.
- Place bees in **field** about 3 **weeks** before emergence is desired.
- When bloom and nesting subside, store nests in a dry place.
- While overwintering, remove parasites and diseased & dead larvae.



# Informative Resources

- USDA-ARS Bee Biology & Systematics Laboratory  
[www.loganbeelab.usu.edu/](http://www.loganbeelab.usu.edu/)
- *How to Manage the Blue Orchard Bee as an Orchard Pollinator* (Bosch & Kemp, 2001)  
[www.sare.org/publications/bob.htm](http://www.sare.org/publications/bob.htm)
- <http://utahpests.usu.edu>
  - Fact sheets
  - Slide shows and photos
  - Utah Plant Pests Diagnostic Lab
  - IPM advisories



# Questions?



# What makes a good commercial pollinator?

- Efficient pollination of target crop
- Pollinator activity coincides with bloom
- Easily managed on a large scale

