The Pollinator Victory Garden – the Bees

Dr. Kimberly Stoner

Connecticut Agricultural Experiment Station

New Haven

CAES

The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875

SAVE THE bees

If we die,
we're taking
you with us.

FORGET THE WHALES, SAVE THE BEES!!!!

KEEP
CALM
AND
SAVE
BEES

CT Public Act 16-17
An Act Concerning Pollinator Health

Pesticides:

- Certain neonicotinoid insecticides (imidacloprid, thiamethoxam, clothianidin, dinotefuran) will become restricted use pesticides and cannot be applied to plants in bloom, except in greenhouses
- Best practices for planting seeds treated with these neonics

Habitat:

- Model pollinator habitat guidelines for
  - Protected farmland
  - Roadsides
  - Restoration or revegetation of utility rights of way
- CT DOT will identify sites for replacing non-native, cool-season grasses with native vegetation including pollinator habitat

Reports on honey bee resistance to *Varroa* mites

Pollinator Advisory Council

No funding+

Choosing flowering plants for bees – What are our goals?

- Forage for honey bees
- Bumble bee conservation
- Agricultural pollination
- Conservation of native bee diversity and healthy plant - pollinator networks

Are Honey Bees an Invasive Species?

- Exotic – brought here by Europeans in 1622
- In early colonial history – feral bees spread ahead of European settlement
- *Varroa* mite and associated viruses severely limited feral bees starting in the late 1980s
- Pathogen spillover from honey bees may be affecting other bees – particularly Deformed Wing Virus in bumble bees
- Evidence of competition between honey bees and bumble bees for floral resources
- Still, providing pollination services essential to our agricultural system (particularly to large acreages with short pollination windows – almonds, lowbush blueberry)

Bee Diversity in Connecticut

- Bees recorded in CT – 349 species
- 9 species are exotic, rest are native to US
- 1 species of honey bee (exotic, social)
- 15 species of bumble bees (native, social)
- 10 species of *Colletes* (cellophane bee – solitary)
- 16 species of *Osmia* (mason bees, solitary)
- 18 species of *Megachile* (leaf-cutter bees)
- 7 species of green sweat bees (mixed solitary & social)
- 80 other sweat bees (mixed solitary & social)
- 78 species of *Andrena* (solitary, ground-nesting)
- And many others!

Bumble bees are declining in species diversity in the Northeast, across North America, and around the world

- Many studies in Canada and the US have found some species declining drastically in abundance and range (including at least 4 species native to CT), while others are increasing
- Similar pattern with different species well-documented in Europe, some parts of Asia and Latin America

Bumble Bee Species of Concern in CT and across the Northeast

Bumble Bee Species	Status throughout Northeast	First and Last Collection Records in CT	Conservation Status in CT
Bombus ashtoni	Declining	1905-1992	Species of Special Concern, Likely extirpated
Bombus affinis	Declining	1904-1997	Species of Special Concern, Likely extirpated
Bombus terricola	Declining	1904-2009	Threatened
Bombus pensylvanicus	Declining	1902-2006	No official status in CT

Bumble Bee Life Cycle

In the early stages, the queen takes care of all nest duties

Nest Making (spring)

As the colony grows, the workers take over

Nest Development (summer)

Queen Foraging (spring)

Mated queens emerge And look for nest Site (Spring)

Queen Hibernates (winter)

Queens and males (summer)

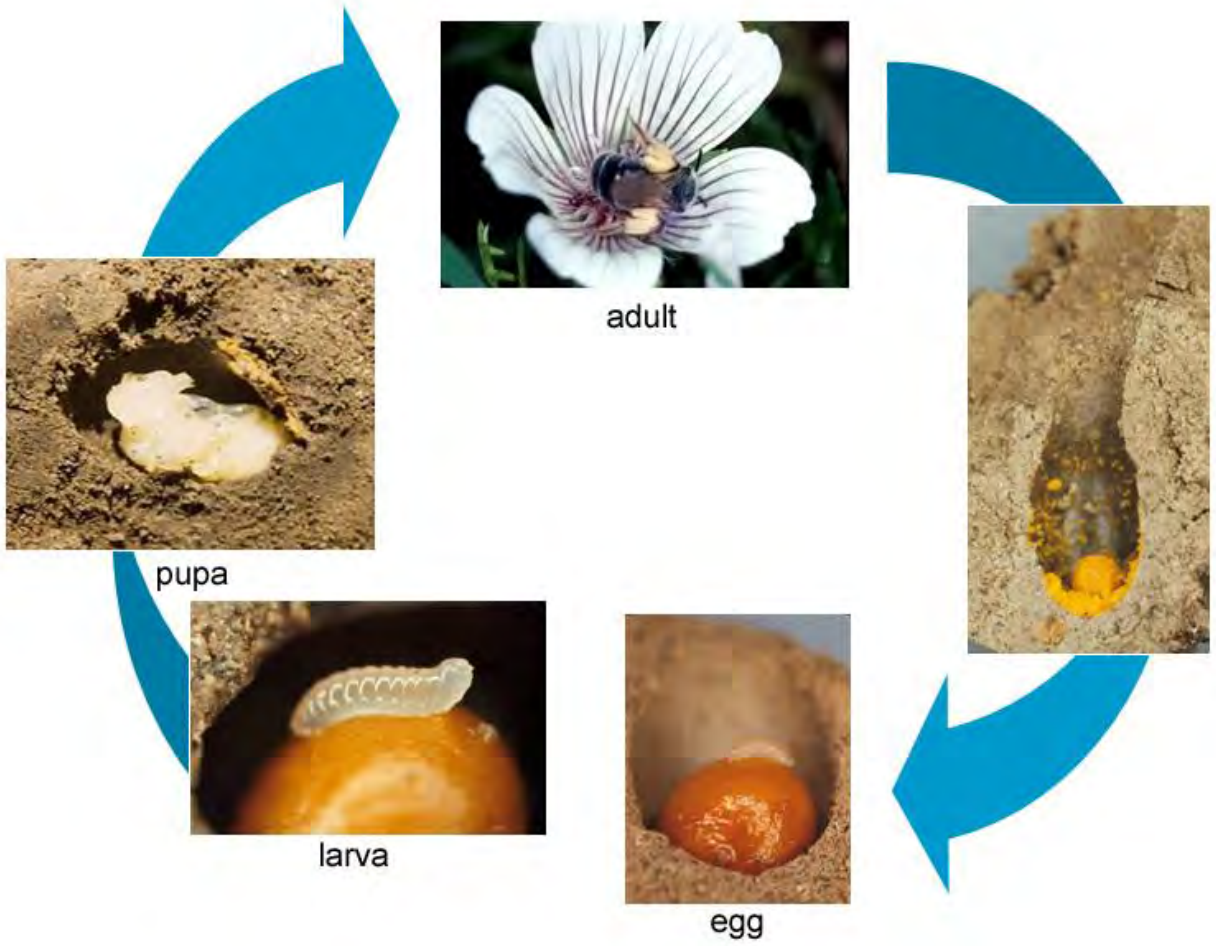
At the end of the colony cycle, males and queens are produced

Planting for Bumble Bees

- Bumble bees are generalists – they use a wide diversity of flowers over a long season
- Need season-long bloom, but the critical periods are spring and late summer - fall
- March - May – Queens establishing nests, need nectar and pollen near nesting sites
- August - October – New queens bulking up to overwinter, need lots of nectar
- Can buzz flowers to release pollen
- Long tongued species can reach nectar deep in flowers

Goldenrod – and late asters

Life Cycle of Solitary Bees



www.xerces.org/nativebees

“Hairy Belly” Bees – *Megachile, Osmia, Anthidium*

Some species are cavity nesting and can be managed for use in pollination by utilizing “bee condos.” Others are leaf-cutters or collect other plant material for nest-making.

- Apple
- Blueberry
- Melons
- Alfalfa

Photo credits: L, Elizabeth Sellers; M, Brooke Alexander, USGS BIML; L Sue Boo, USGS BIML

Colletes – Solitary Bees
Nest in the ground in aggregations

Halictids or Sweat Bees

Small Bees, Can Be Social or Solitary

Land on Skin Seeking Sweat

Halictus ligatus

Nest of *Halictus ligatus*, Belinsky Farm, Oxford

Andrenid Bees
Ground-Nesting, Solitary, No Venom, Many are Plant Specialists

Andrena carolina on blueberry – J. Tuell

Andrena on American holly

Native Plants for Specialized Native Bees

- Golden Alexanders*, Zizia spp.*, provide pollen for *Andrena ziziae*
- New York Ironweed, *Vernonia noveboracensis,* provides pollen for *Melissodes denticulata*
- Feeding the specialist bees: 57 species in New England that specialize in 1 or 2 host plant genera

Native plants that do it all! Specialists + Generalists

- Willows (*Salix spp.)*
- Blueberries (*Vaccinium spp.)*
- Sunflowers (*Helianthus* spp.)
- Bee balm (*Monarda spp.*)
- Goldenrods (*Solidago spp.*)
- American asters – especially New England aster (*Symphyotrichum novae-angliae*)

Tracy Zarrillo

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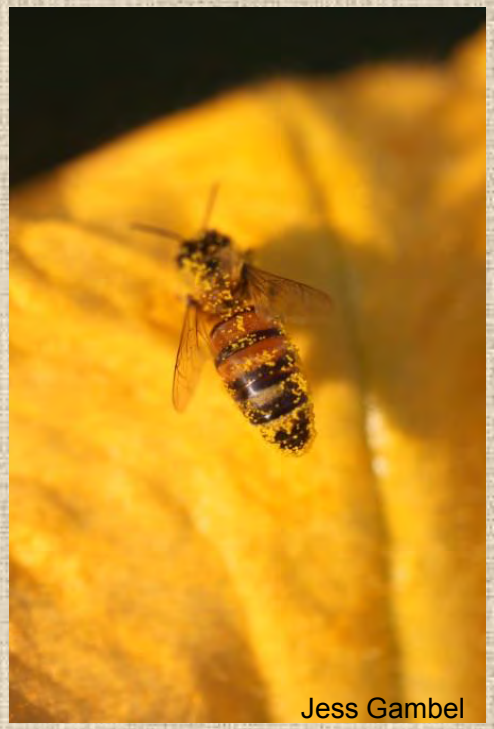
Kimberly Stoner
Department of Entomology
123 Huntington Street
P. O. Box 1106
New Haven, CT 06504



Jess Gambel

Phone: 203.974.8480
Email: Kimberly.Stoner@ct.gov

Website: www.ct.gov/caes
Find “Pollinator Information” in the left-hand column