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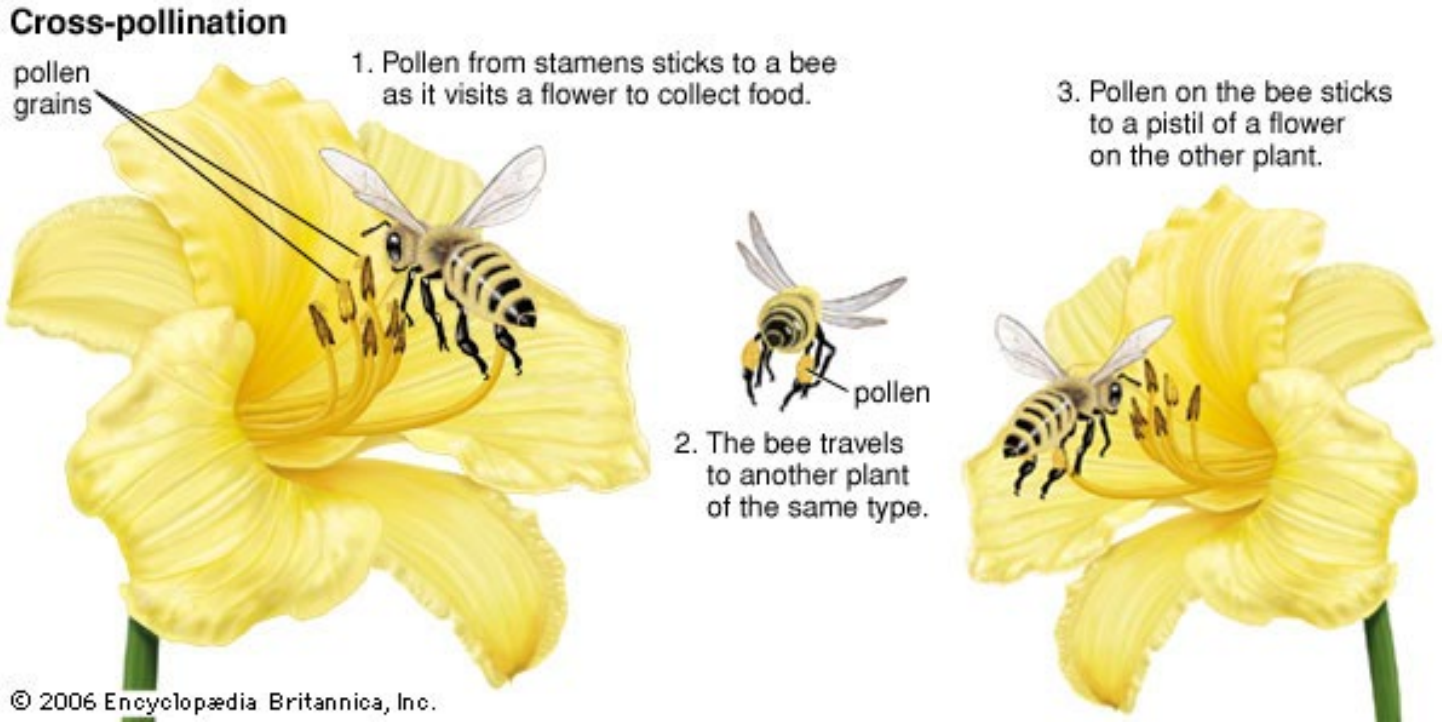
ENCOURAGING NATIVE BEE POLLINATORS

WHAT IS A NATIVE POLLINATOR?

- Indigenous animal that moves pollen from the male anther of the flower to the female stigma of the flower



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WHAT ARE POLLINATORS?

90% flowering plants rely on animal pollinators for fertilization

- $15 billion annually to crop yield & quality

200,000 species of animal pollinators

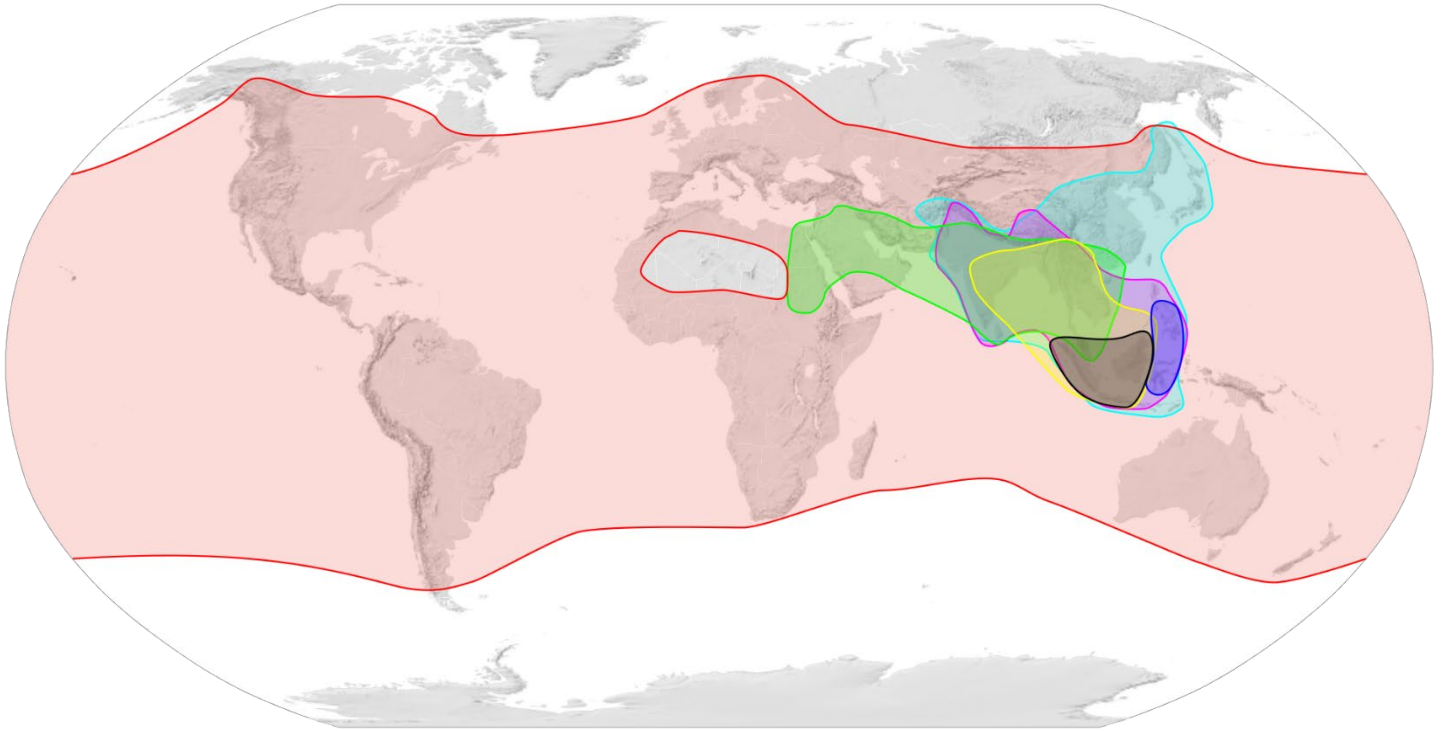
1,000 birds, bats, mammals

All the rest are insects!

TEXAS A&M AGRILIFE EXTENSION

A NOTE ABOUT HONEY BEES…

- Not actually native to North America
- Introduced by European settlers in 1600s



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KSAT

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INSECT POLLINATORS

Bumblebees


Long antennae; 2 pairs of wings; round and furry; 8-30mm

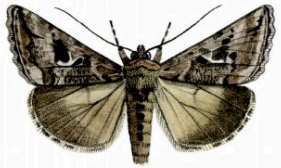
Honey bees


Long antennae; 2 pairs of wings; striped ginger-brown; 5-15mm

Butterflies


Club-like antennae; butterflies rest with their wings closed

Moths




Feathery antennae; most moths rest wing their wings open

Solitary bees


Long antennae; 2 pairs of wings; narrower than bumblebee; 3-15m

Hoverflies


Short club-like antennae; large eyes; hovers or darts in flight

Beetles


Wing cases meet in the middle in a T shape

Other flies


Short antennae; 1 pair of wings; large eyes

Open.edu

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WHAT MAKES AN INSECT WANT TO POLLINATE?

- Some insects are after pollen
  - Pollen = protein
- Most insects are after the nectar
  - Nectar = sugar = carbohydrate

NATIVE BEES

- 4,000 species
- Better at pollinating native plants, pumpkins, cherries, blueberries and cranberries, tomatoes, eggplants.

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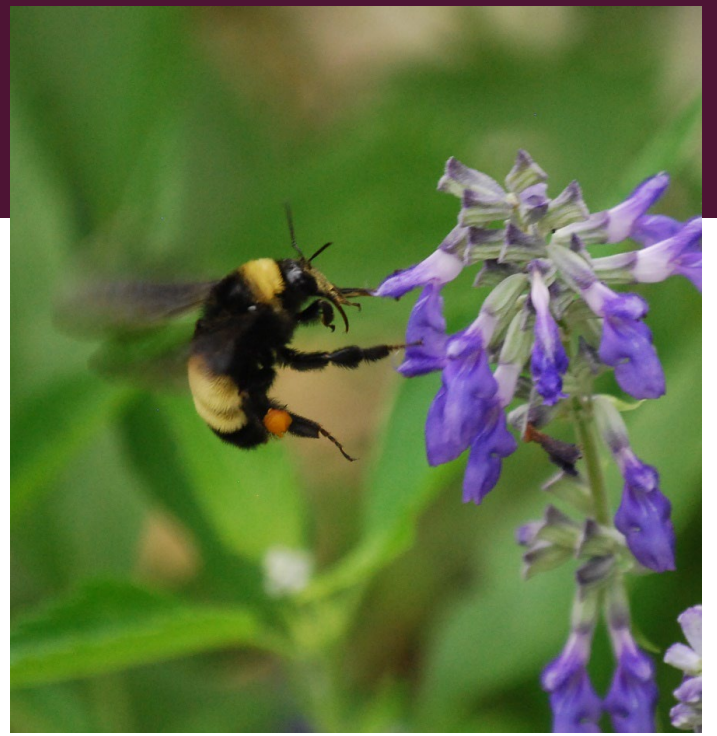
BUMBLE BEES - *BOMBUS*



- 50 species in North America
- Social bees

Texas Bumblebees

TEXAS PARKS & WILDLIFE

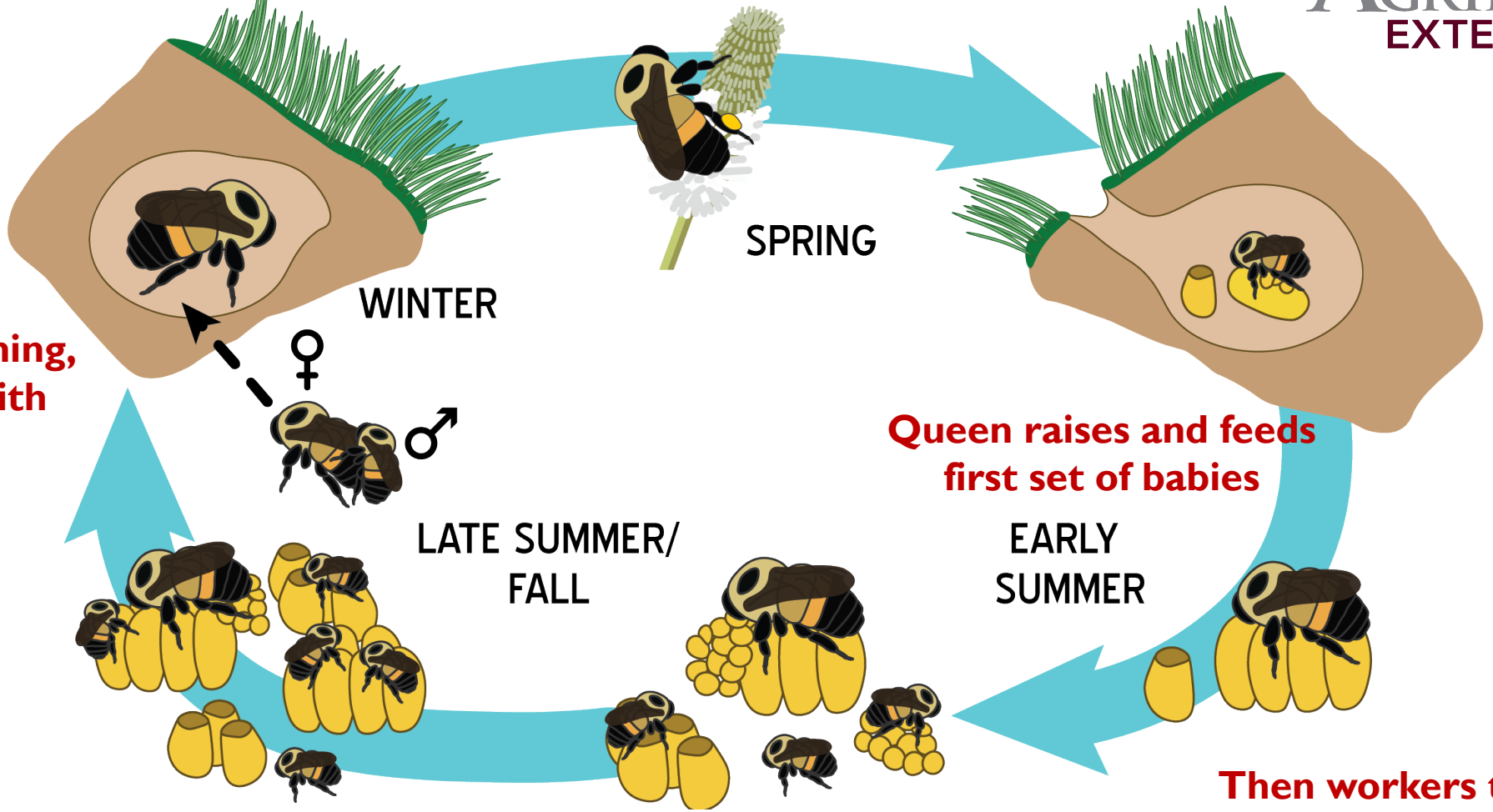
TEXAS A&M AGRILIFE EXTENSION

Biopest.com

Nest initiated by an overwintering female queen

Spring, the queen forages for food and seeks a new nesting site

TEXAS A&M AGRILIFE EXTENSION



Winter approaching, queens mate with males

Queen raises and feeds first set of babies

Then workers take over

Starts to produce males, mate with females, produce new queens.

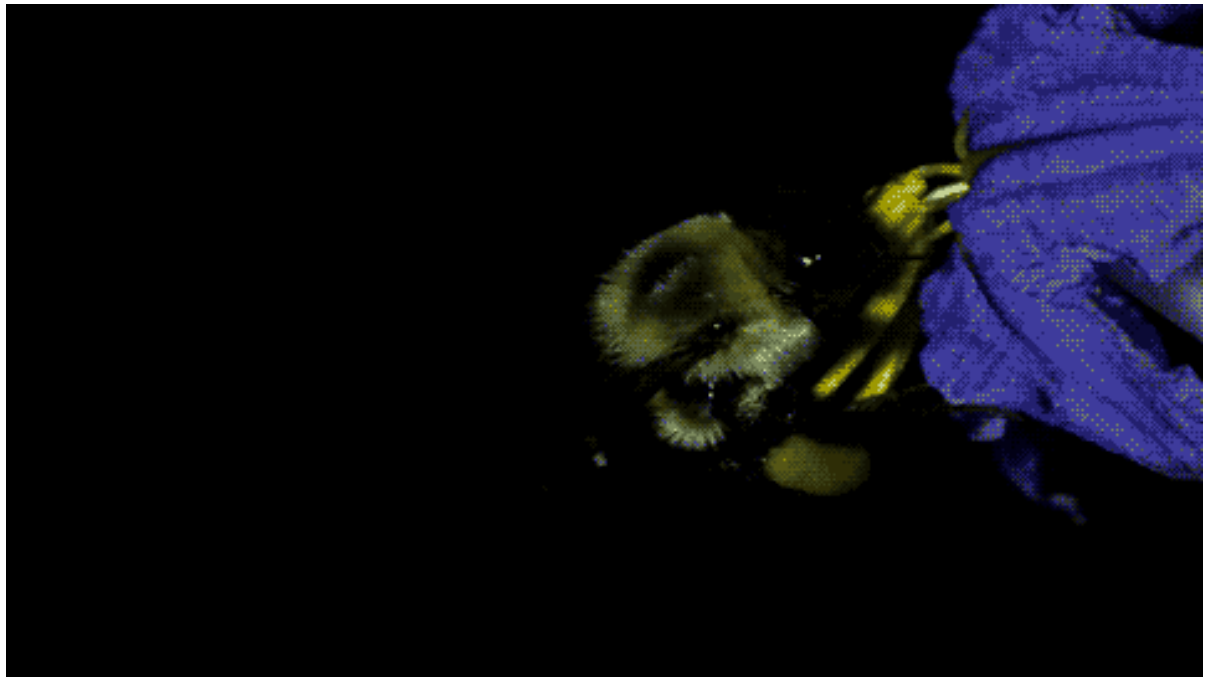
University of Wisconsin Madison

BUMBLE BEE NEST

- Ground
- Old Stumps
- Empty bird houses and other voids

BUMBLE BEES - *BOMBUS*

- Generalist feeders
- Produce bigger fruit, faster fruit set, and larger yields than honey bees
  - Buzz pollinate
  - 8x more work than honey bee
- Fuzzy body allows activity when colder
- Can fly during rain
- Carry more pollen than HB



TEXAS A&M AGRILIFE EXTENSION

BOMBUS AFFINIS – RUSTY PATCH BUMBLE

- First US bumble bee to be listed on endangered species list
- Upper MidWest
- Habitat destruction and intensive farming of plains

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SOLITARY BEES

SOLITARY BEES

- Often solitary
- Males emerge first and wait for females
  - Females laid in back
  - Provisioned with food
  - Usually laid in summer, emerge next spring

Beediverse.com

CARPENTER BEES - *XYLOCOPA*

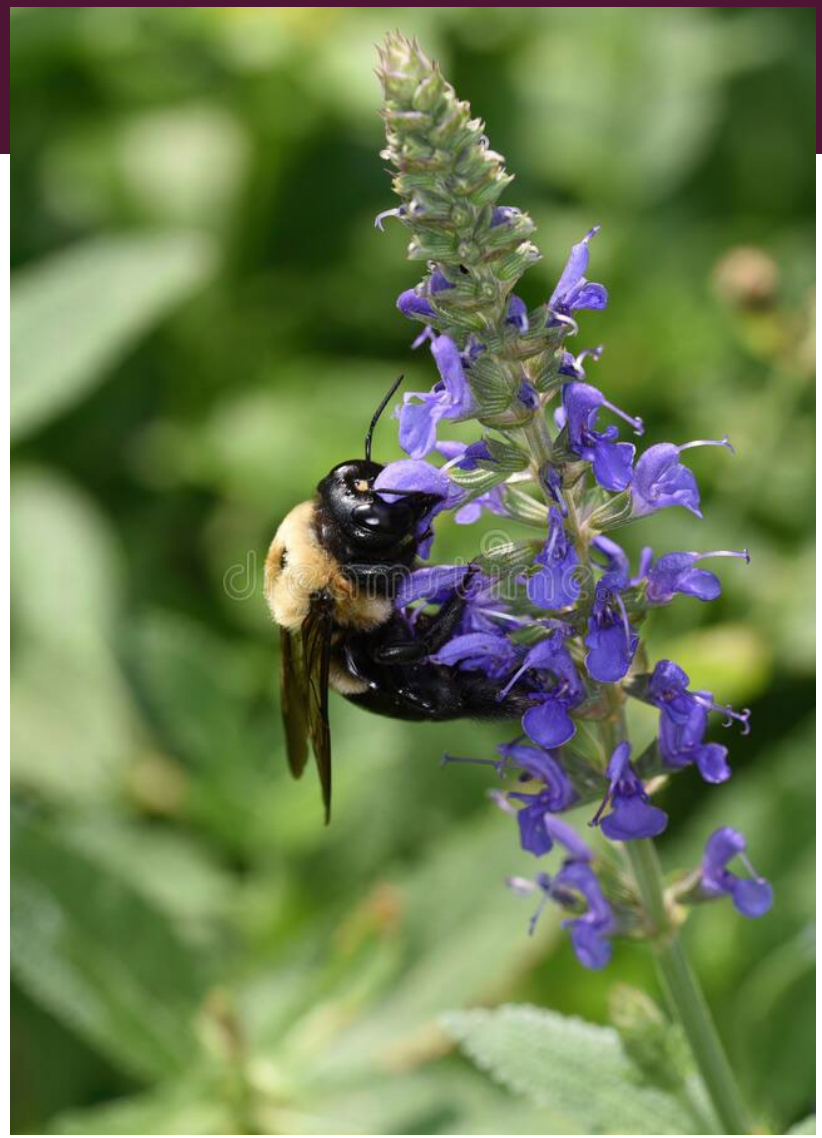
- 10 species in N. America
- Chew large holes for nests
- 1-2 broods per year
- Mothers meet offspring, may guard and feed them
  - Return to mother nest to overwinter in huddled group

TEXAS A&M AGRILIFE EXTENSION

CARPENTER BEE DAMAGE

CARPENTER BEES - *XYLOCOPA*

- Generalist feeders
- Large body = large bushels of pollen
- Cannot feed on tubular flowers
  - Cut hole at base and sip nectar



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DIGGER BEES – ANTHROPORINI GROUP

Bugguide.net

- *Anthophora* & *Habropoda* genera
- Generalist to specialist feeders
- Hairy bodied bees

TEXAS A&M AGRILIFE EXTENSION

DIGGER BEES – ANTHROPORINI GROUP

- Ground nesters
- Often aggregate
  - May even be communal, sharing entrance with separate cells

Bugguide.net

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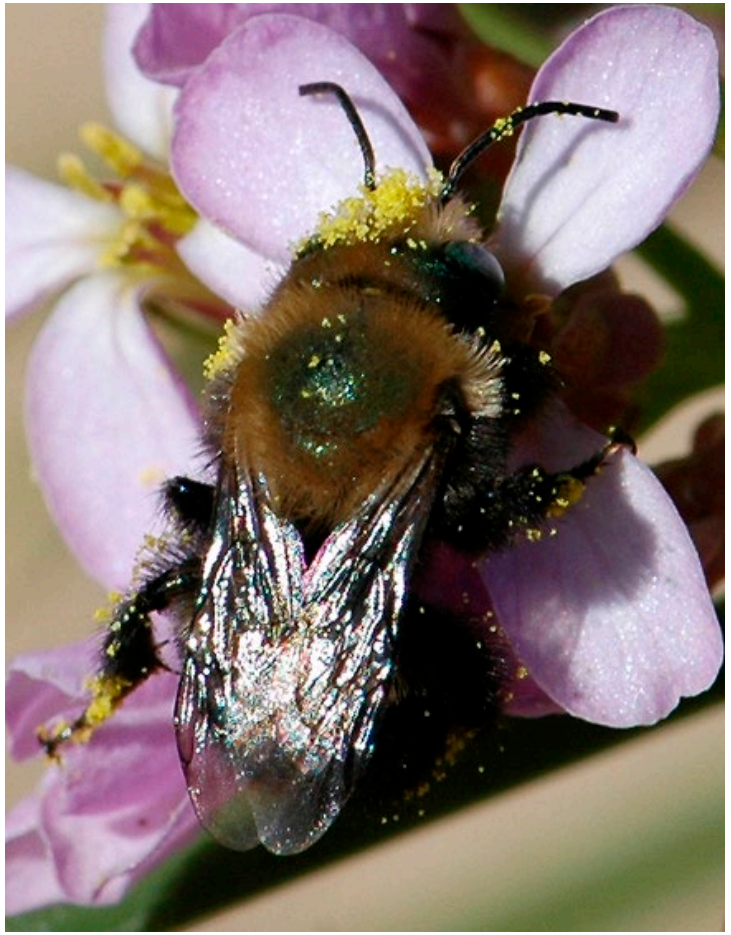
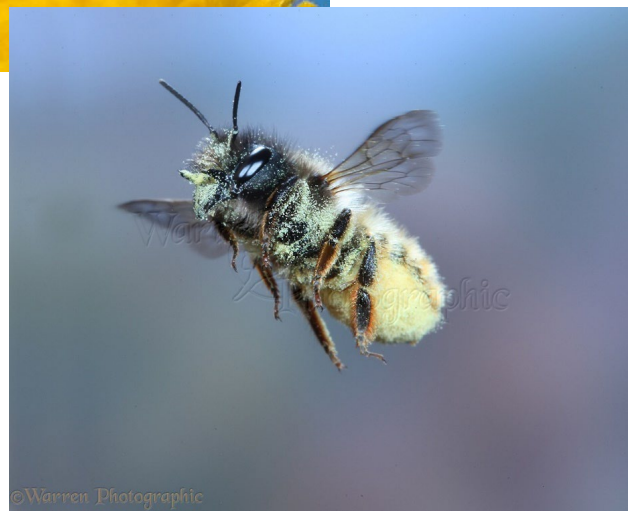
MASON BEES - *OSMIA*



BugGuide.net

TEXAS A&M AGRILIFE EXTENSION

MASON BEES - *OSMIA*



- Generalists to specialized pollen collectors
- Specialized structures on body to collect pollen

- More efficient pollinator of apples, almonds, plums, cherries than honey bee
  - 90,000 HB = 300 *Osmia*

Missouri Department of Conservation

TEXAS A&M AGRILIFE EXTENSION

MASON BEES

- Solitary
- Build nests from mud
- ‘Squatters’ – use empty cavities
- Do not like to dig

- Eggs in back are female, front are male

TEXAS A&M AGRILIFE EXTENSION

MASON BEES

- Emerge early spring, mate
  - Gather favorite food = fruit pollen and nectar, kneed into ball
  - Lay egg on top of food balls and seal up cell, seal up and repeat
  - Seal up after 5-8 cells
  - Develop and emerge as adults next spring

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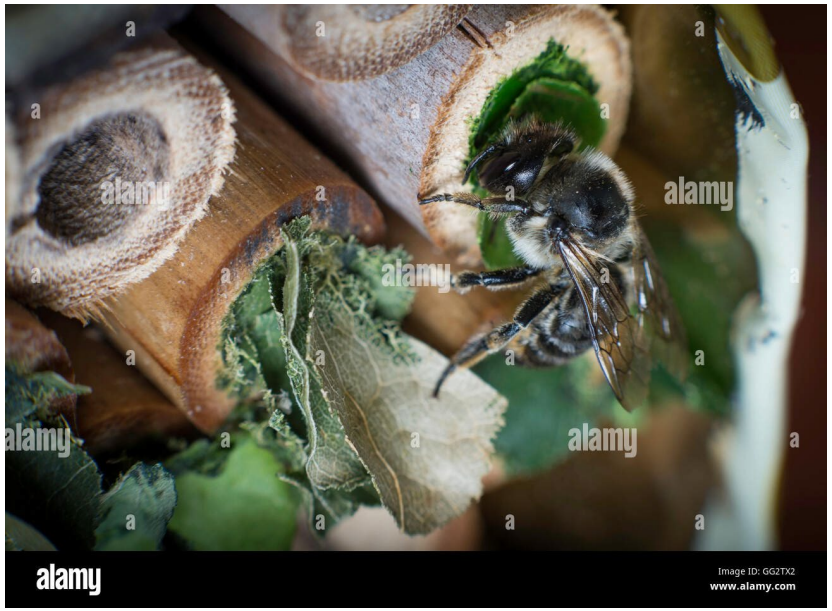
LEAFCUTTER BEES - *MEGACHILE*

- 140 species in North America
  - 2005 – new Texas species discovered

TEXAS A&M AGRILIFE EXTENSION

LEAFCUTTER BEES - *MEGACHILE*

- Nest in pre-existing cavities
- Line cavity with leaf cuttings
- Solitary but gregarious



Megachile nests found under a rock

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METALLIC GREEN BEES - *AGAPOSTEMON*

- Medium sized, green metallic
- 14 species

- Generalists
- Nest in ground
- Don't aggregate, but communal (share same entrance)

TEXAS A&M AGRILIFE EXTENSION

SWEAT BEES – *AGAPOSTEMON & HALICTUS*

- Sometimes sip human sweat
- Generalist to specialist feeders
- Nest in ground
- Solitary to social
  - Some species decide social level depending on weather/conditions

TEXAS A&M AGRILIFE EXTENSION

PLASTERER BEES – SUBFAMILY COLLETINAE

- Medium to large sized, furry bees
- 99 species in US
- Specialist feeders
  - *Colletes linsleyi* native to US, but feeds on non native salt cedar

PLASTERER BEES – SUBFAMILY COLLETINAE

- Ground nesters without vegetation
- Soupy pollen mass for offspring
- Lay eggs on wall
- Line with cellophane substance produced from saliva and Dufour's gland secretion

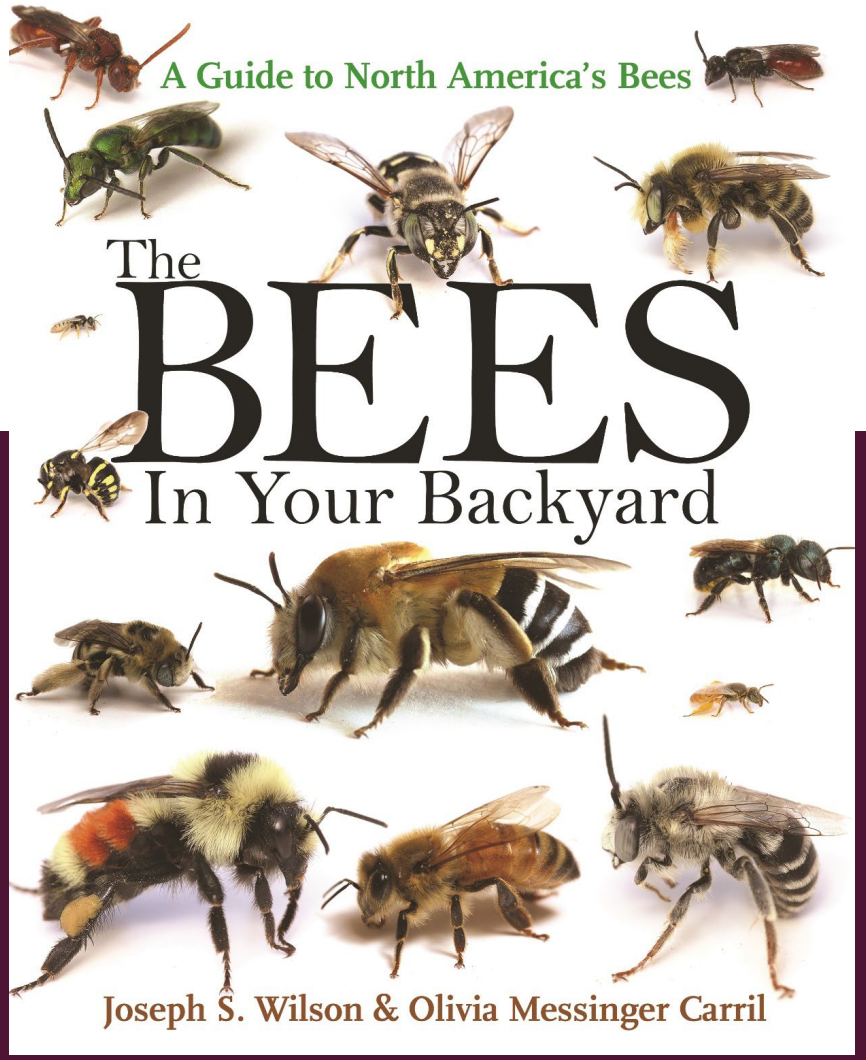
TEXAS A&M AGRILIFE EXTENSION

HYLAEUS

- Wasp like bees
- No pollen basket/scopa
- Eat pollen and nectar and regurgitate at nest
- Nest in pre-made holes
- Line with cellophane or silk substance

TEXAS A&M AGRILIFE EXTENSION

GREAT RESOURCE!



TEXAS A&M AGRILIFE EXTENSION

HOW TO ENCOURAGE NATIVE BEES

- Avoid pesticides when bees active – apply before dawn and at sundown
- Water and mud source
- Provide nesting habitats
- Bee houses, dead stumps, native grasses, plants, and shrubs instead of manicured lawn

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NATIVE BEE NESTING SITES – GROUND NESTERS

Iowa State University

- Any ground area left undisturbed
- Garden pathways of packed dirt
- Unpaved drives and dirt patches
- Mounds of soil
- Sand pits –
  - 2 feet deep
  - 2-3 feet wide
  - Fine grained sand, sandy loam

TEXAS A&M AGRILIFE EXTENSION

NATIVE BEE NESTING SITES – TWIG NESTERS

World of Succulents

- Leave dried stems in winter
  - Yucca
- Logs and woody debris
- Stumps

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SOLITARY BEE HOUSES

- Use varying sized holes
  - .25-.5 inches diameter
  - 3-6 inches
- Provide roof to avoid moisture

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SOLITARY BEE HOUSES

- Straws, hollow bamboo, cardboard tubes
- Replace each spring after emergence

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SOLITARY BEE HOUSES

- Move into protected place in winter months

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SOLITARY BEE HOUSES

- Placement – little data
  - Anywhere it won't be damaged
  - Face south/southeast
- Height – wherever you have a spot!
- Proximity to garden
  - Doesn't seem to matter

TEXAS A&M AGRILIFE EXTENSION

WHITE, YELLOW, BLUE, PURPLE

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THANK YOU!

MOLLY KECK - INTEGRATED PEST MANAGEMENT PROGRAM SPECIALIST

MORE WAYS TO LEARN! PODCASTS

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