

Hot Science Cool Talks

UT Environmental Science Institute

107

The Buzz About Bees: How They Improve Our Lives

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THE BUZZ ABOUT BEES: HOW THEY IMPROVE OUR LIVES



Shalene Jha
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Integrative Biology
The University of Texas
at Austin



BEE-FORE WE START....

1. Pollination
2. Why bees are great
3. Different types of bees
 - Honey bees
 - Native bees
4. How you can help



Research &
tasty foods!

BREAKFAST WITH BEES



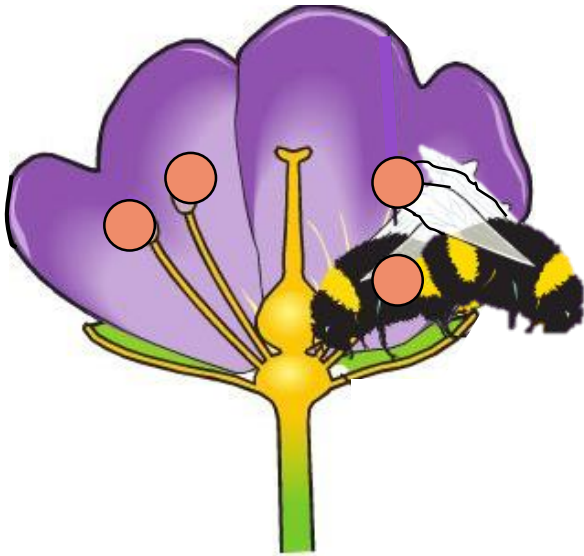
L. Russo

BREAKFAST **WITHOUT** BEES

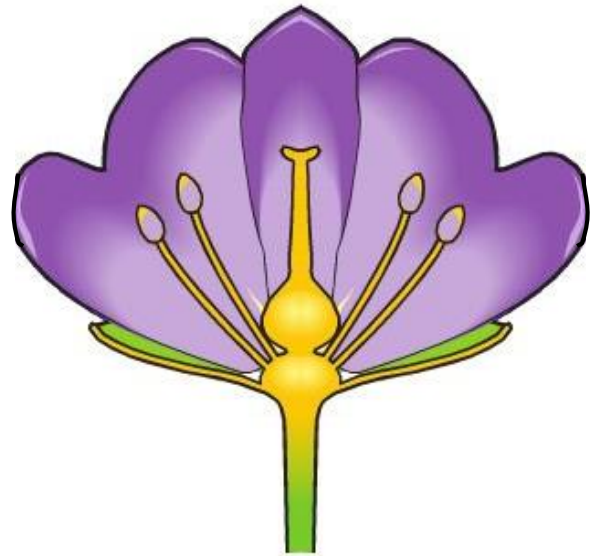


INSECT POLLINATION

pollen sticks to the
body of the insect



pollen falls from the
insect onto the stigma



FROM FLOWER TO FRUIT



<http://elleandless.blogspot.com>



**insect
pollination**

no insect pollination



MY FAVORITE FRUIT



wiseGEEK



my nani (grandma)

MY FAVORITE FRUIT



B. Crutzen

MY FAVORITE FRUIT



<http://discoverpollinators.org/>

POLLINATION SERVICES = \$

- > 1/3 of US crops
- > 2/3 of global crops
- > \$18 billion in U.S./year
- > \$200 billion in world/year





BEES ARE IMPORTANT POLLINATORS

- bees are vegans – eat nectar and pollen
- evolved structures to collect pollen
- pollinate many plant species
- ‘loyal’
- ‘messy’





Alliec2007

BREAKFAST WITH BEES



OH, HONEY!

- honey = stored regurgitated and evaporated nectar
- groups that produce honey...
 - honey bees, bumble bees, stingless bees
- humans have been foraging for honey for ~10,000 years



<http://s.doctoroz.com>

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Cave painting, Valencia, Spain ~ 8000 BC

WHO MAKES HONEY IN THE U.S.?

- European honey bee
Apis mellifera -
[is not native to U.S.]
- social - up to 50,000
workers/colony
- honey is stored to feed
the brood & adults



EUROPEAN HONEYBEE (*APIS MELLIFERA*)

HONEY, I'M NOT HOME...



<http://www.comoxvalleybeeclub.comz>

YES! THERE ARE WILD NATIVE BEES!



Dennis Briggs

- 20,000 species globally
- ~4,000 in U.S.
- ~1,000 in Texas!

- >70% bees nest in the ground

- >90% bees are solitary

T'a

EGG on pollen ball

BREAKFAST WITH BEES



LEAF CUTTER BEES

solitary

medium sized
'stocky' –
fuzzy bellies

nest in wooden
holes, lined
with cut leaves



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EUGLOSSINE BEES

solitary to
communal

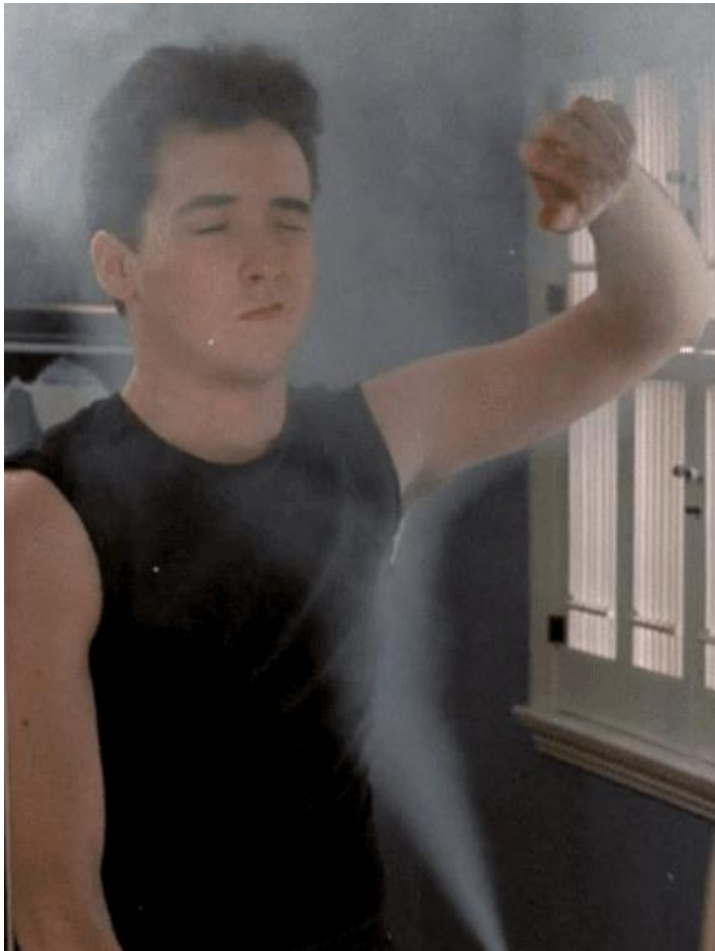
medium sized,
metallic &
colorful

males collect
“cologne”!

specialized
pollination
of orchids



EUGLOSSINE BEES



EUGLOSSINE BEES



NAT GEO
WILD

NAT GEO
WILD

BREAKFAST WITH BEES



BEFORE COFFEE



AFTER COFFEE







- coffee yield increases with # bee species
- bees need shade trees \leftrightarrow shade trees need bees
- shade trees reduce landslides

STINGLESS BEES

social ~300-
30,000 workers

managed by
communities
today

don't sting, but
guard nests

...and pull hair!



E. Lichtenberg

STINGLESS BEES

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<http://foodscaping.blogspot.com>

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BREAKFAST WITH BEES



HOW DO YOU FIND A BUMBLE BEE NEST?

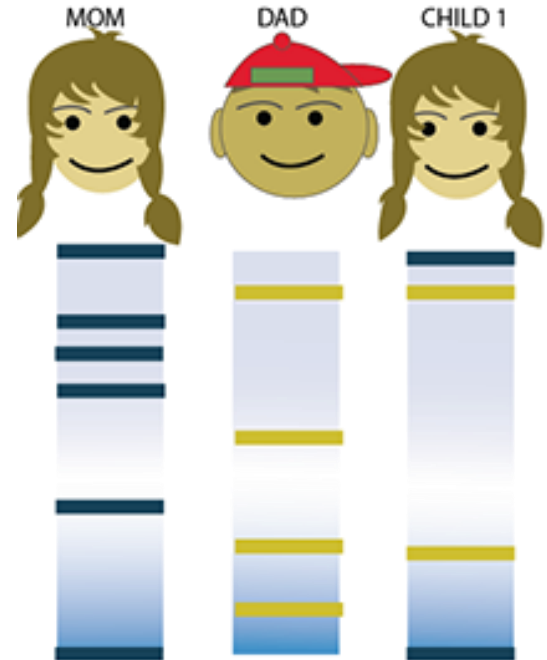


HOW DO YOU FIND A BUMBLE BEE NEST?

- even with a sniffer dog, it can be tricky!
- we can use DNA fingerprinting!

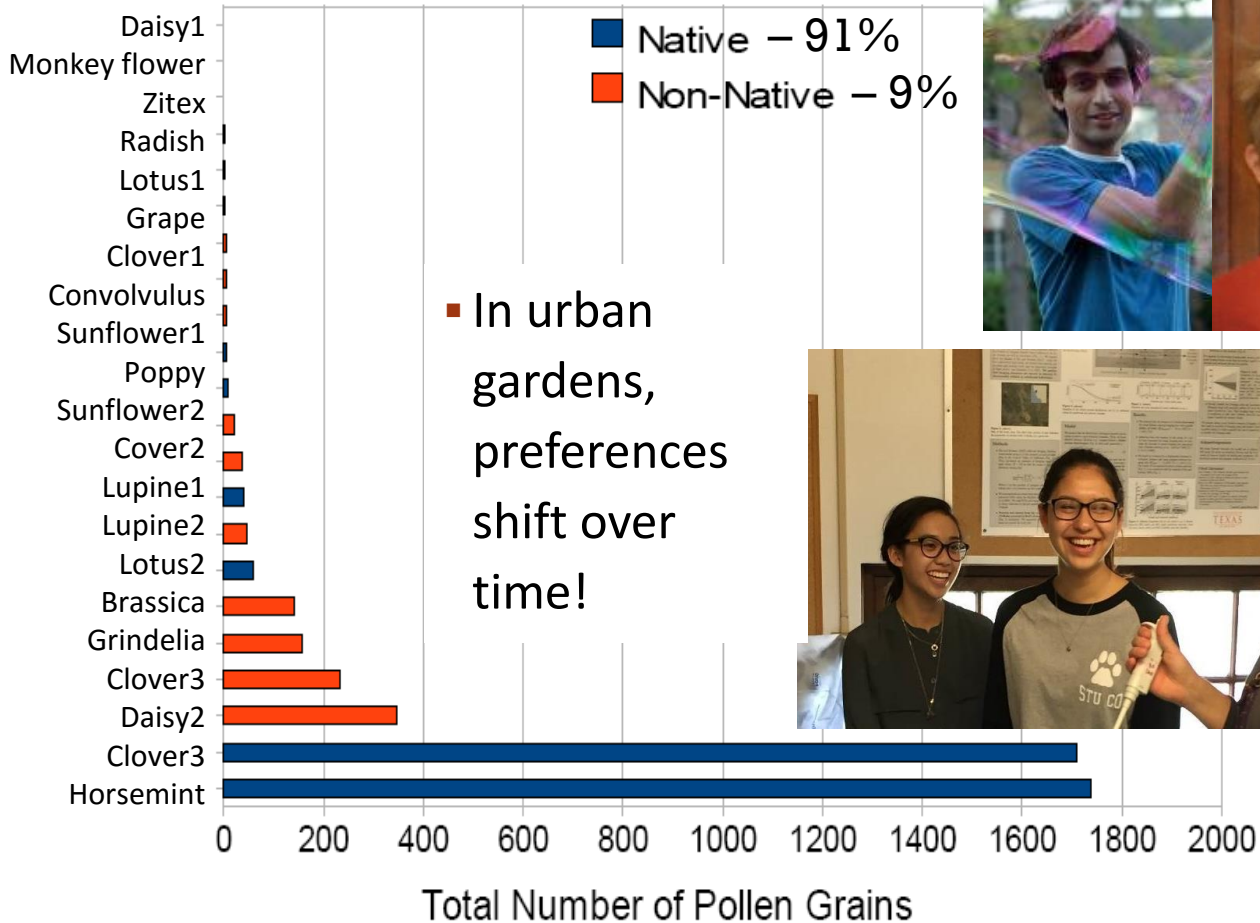


- nest densities higher in wooded habitat, lower in paved areas

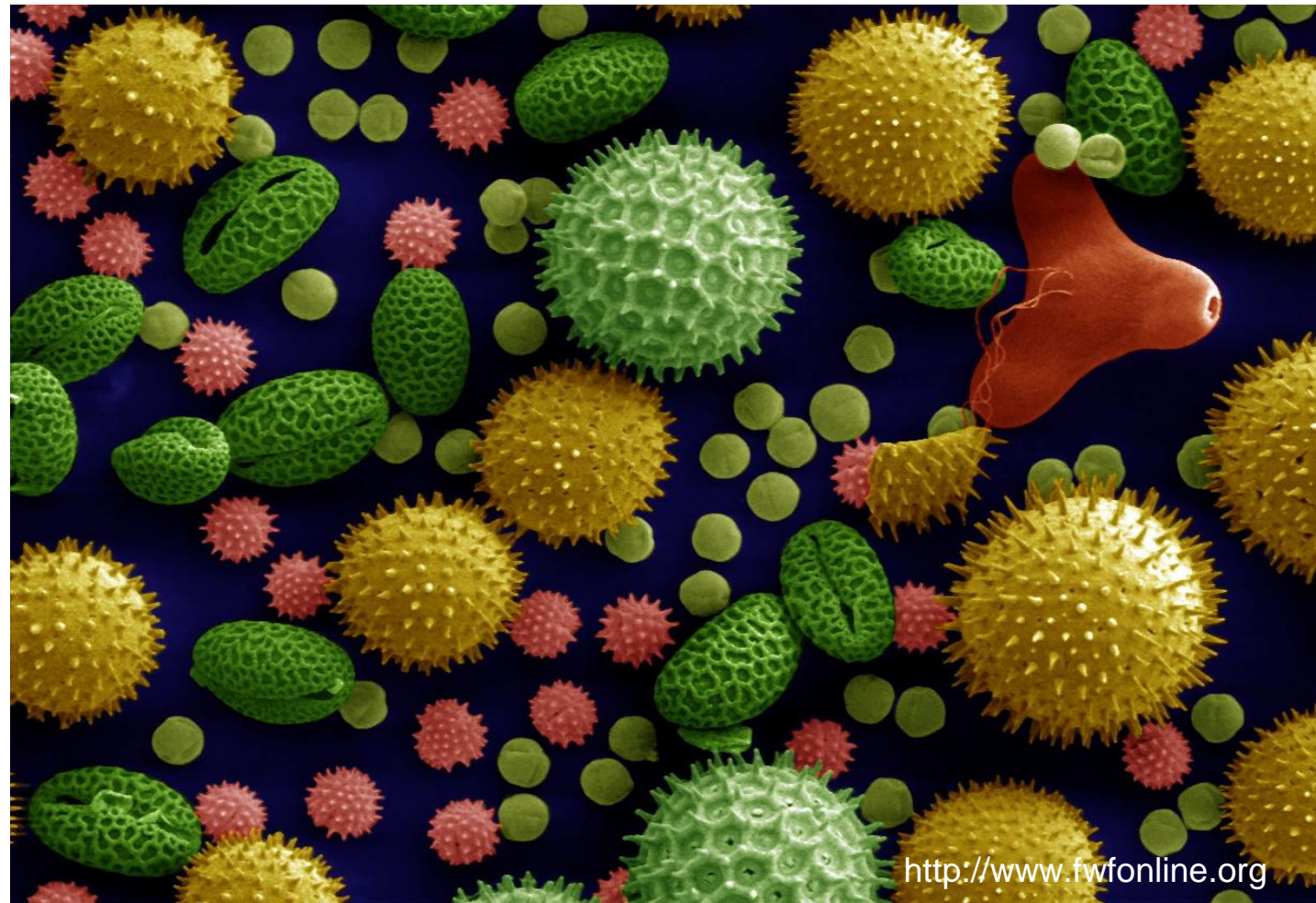


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POLLEN GRAINS TELL US WHAT BEES EAT

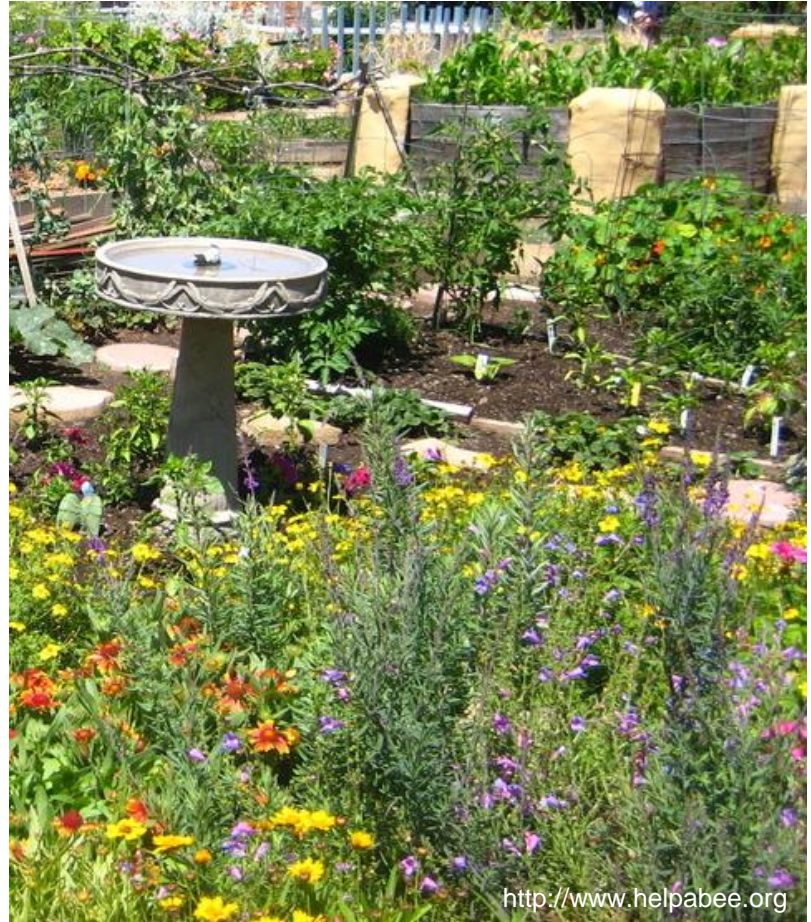


POLLEN GRAINS TELL US WHAT BEES EAT



BEES IN YOUR URBAN GARDEN

- bee species decline with % mulch
- local floral richness can help! 😊



BREAKFAST WITH BEES



L. Russo

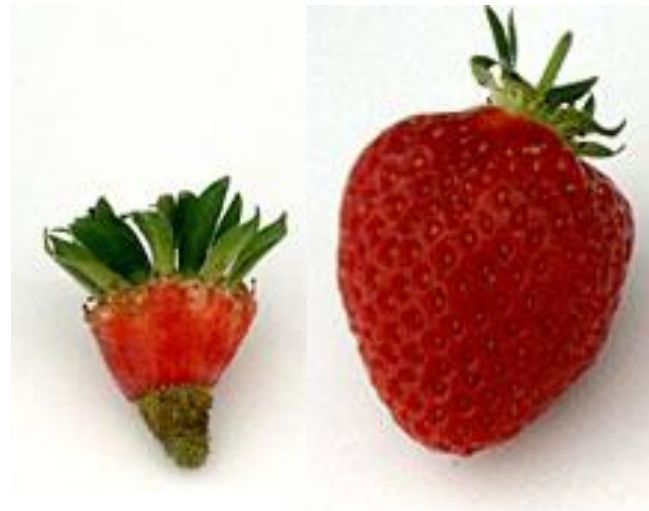
BEES & COTTON

- 17% yield increase with pollination
- worth over ~\$100 per acre
- habitat fragments increase bee abundance



BEE KEY POINTS

- there are more than honey bees20,000 more species!
- bees come in all shapes & sizes
- not all bees sting!
- most bees are solitary & nest underground
- bees need food & shelter
- bees are necessary for human nutrition & ecosystem health

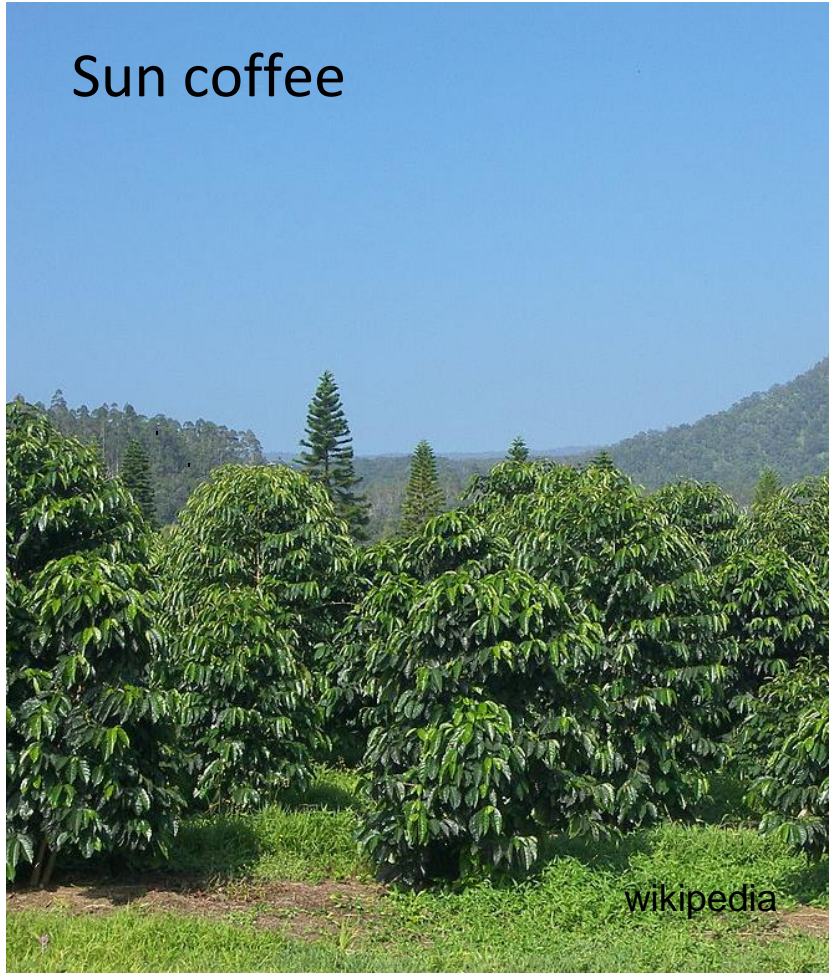


HOW TO SUPPORT NATIVE BEES

support sustainable land practices

- preservation & restoration of natural habitat
- urban, periurban & rural
- agricultural

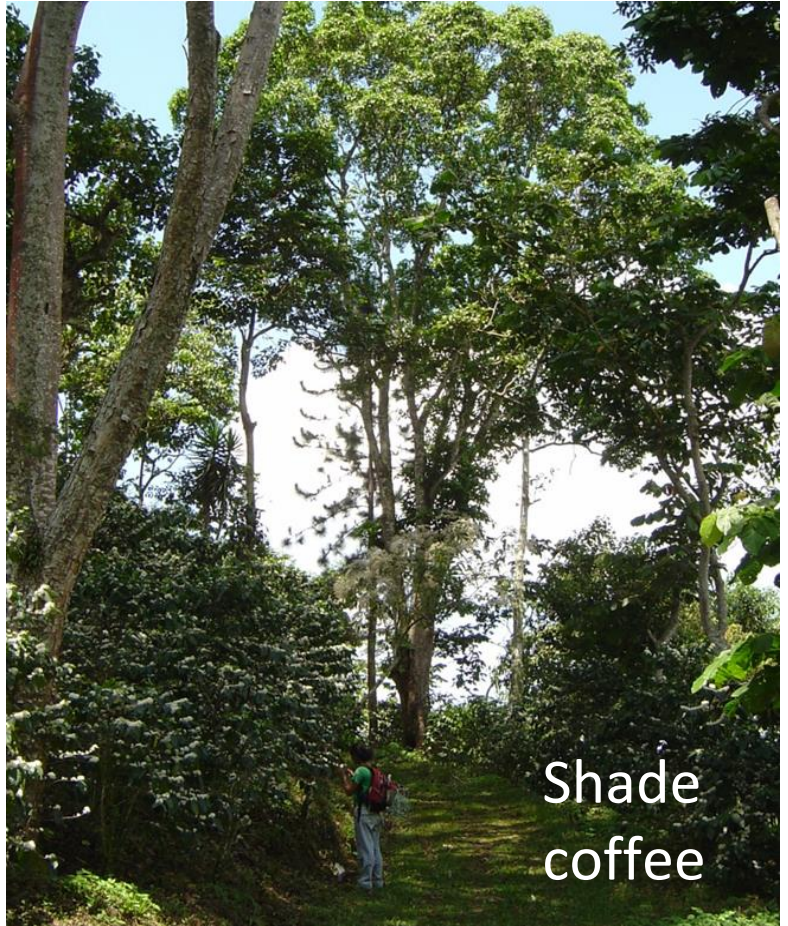
Sun coffee



HOW TO SUPPORT NATIVE BEES

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Shade
coffee

Plant a pollinator garden



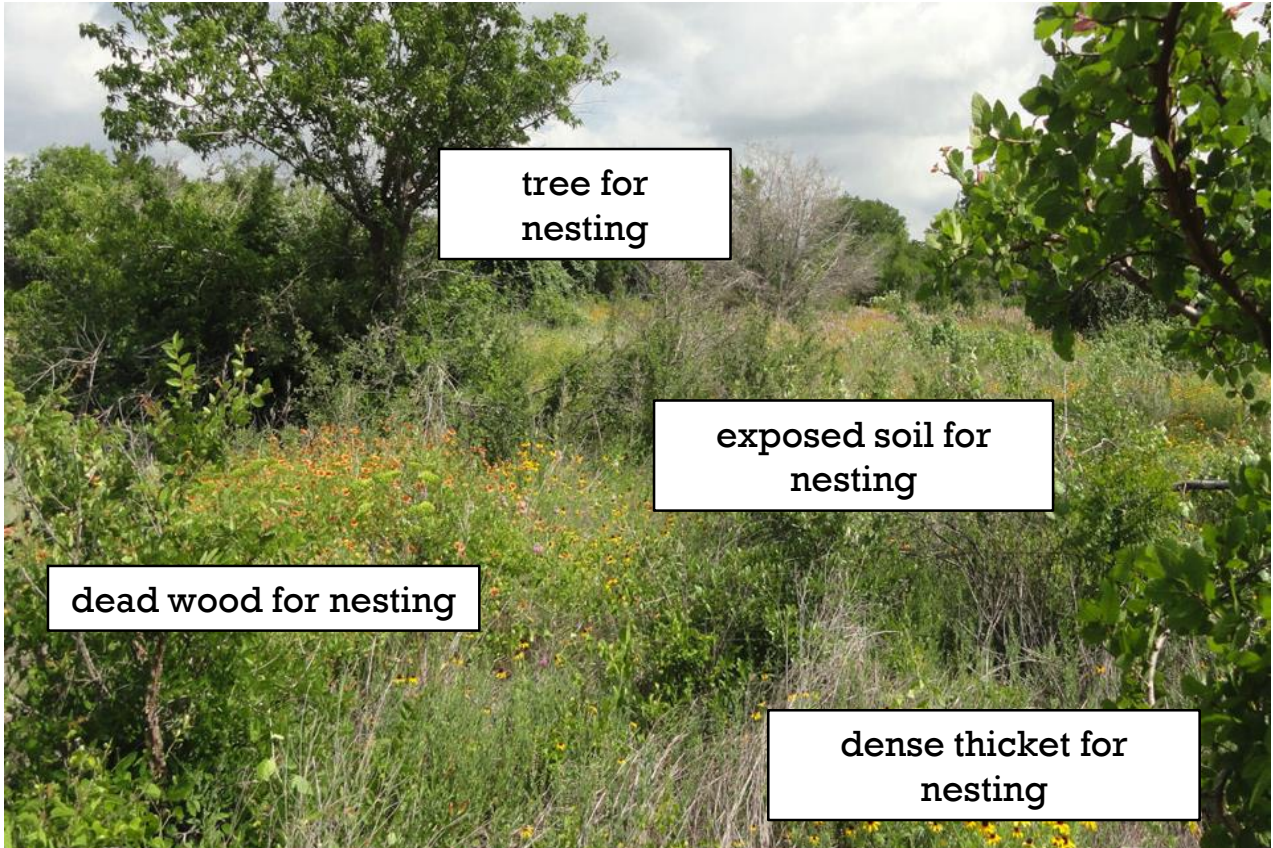
Laurel Mountain Elementary
Pollinator Garden

Promote flowering plant variety

- many species -
different
flowering periods
- variety of colors -
blue, purple,
yellow, white
- local natives



Promote nesting habitat



Avoid pesticides

best: avoid altogether

better: do not spray on flowers, spray at night



Promote prairie restoration

- Degraded prairies often need fire & native plant seeding
- TPWD - Private Lands and Habitat Program



<https://www.austincollege.edu>

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<http://www.nokeslandscapedesign.com>

Promote prairie restoration

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Management Recommendations for
Native Insect Pollinators in Texas



TEXAS
PARKS &
WILDLIFE



GROW WILD UK - URBAN PRAIRIE RESTORATION



CONSERVATION RESOURCES – UT JHA LAB

Native Bees of Barton Creek Habitat Preserve

Ground Nesting

Lasiglossum spp.
Sweat bee
Solitary to social
Small
Very common to rare



Diadasia rinconis
Cactus bee
Solitary
Small-medium
Common



Agapostemon texanus
Metallic green bee
Solitary-communal
Small
Rare



Perdita ignota
Miner bee
Solitary
Small
Very rare



Augochloropsis metallica
Sweat bee
Facultative social
Small
Very rare



Solitary: One female builds a nest and provisions her young alone

Communal: Several females share a nest but each one provisions her young alone

Social: Multiple females build the nest and provision their young together

Cavity or Wood Nesting

Osmia subfasciata
Mason bee
Solitary
Medium
Common



Xylocopa virginica
Carpenter bee
Solitary
Large
Common



Megachile brevis
Leafcutter bee
Solitary
Medium
Rare



Megachile polaris
Leafcutter bee
Solitary
Medium
Rare



Osmia conjuncta
Mason bee
Solitary
Medium
Very rare



Small ± 10 mm



31 species

Medium ± 13 mm



Large ± 19 mm



Jha Lab - UT Austin

1. & 10. (CC) Sam Dreger. www.flickr.com/photos/samdreger/ 2. (CC) 2012 Tom Van Steenderen. madrising.org 3. (CC) Andrew Redding 2008. bugzillas.net 4. ©Daphne Kasher 2008-2010. daphnekf.com 5. (CC) Jim McCallister 2008. naturalist.org 6. Val Singh. www.wildbee.com 7. (CC) Scott McEwan 2008. iStockphoto.com 8. (CC) 2010 Beelzebub. www.flickr.com/photos/beelzebub/

Tips for Improving Native Bee Habitat

Flowering Plants



Mealy blue sage 1



Bee balm 2



Sunflower 3



Basket flower

Maintain flowering plant communities - like meadows - to provide diverse and consistent blooms throughout the season
Plant native flowering species that provide nectar and pollen for bees from April to August

Nesting Materials



Leave wooded areas intact - they provide nesting habitat for cavity-nesting bees



Encourage leafy growth - native bees often use leaves for nest construction



Leave areas of bare ground for ground-nesters to occupy
Keep the ground undisturbed to help the young survive the season to the next spring

Jha Lab UT Austin

1. Ray Matthews, 2. Lee Page, 3. Harry Cline (Univ. of Nebraska) www.wildflower.org/gallery/ 4. Ghies San Martin, 5. Chris Worehen, 6. Rob Cruickshank

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