

BEE-UTIFUL DESIGN – LECTURE HANDOUT

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6 Things you can do for pollinators:

1. Plant a diversity of pollinator plants
2. Reduce or eliminate pesticides
3. Provide nesting sites
4. Register your garden
5. Support local bees and beekeepers
6. Reach out – Inform & Inspire others

What does your garden look like from a bee's point of view?

- 2 Different Types of Eyes
 - o 3 Ocelli maintain stability, navigate, gather light intensity & detect UV flower colors
 - o 2 Compound Eyes with 1000's of tiny lenses called facets, bee's GPS system
- Trichromatic
- Bees see blue, green & UV but NO red tones

Invisible Patterns in Flowers – Ultraviolet Light

- Many flowers have “nectar guides” only visible in UV light that gives bees an advantage when seeking nectar. Examples: Bulls-eyes & Landing strips

Basics of Bee Garden Design

1. Recognize existing habitat
2. Protect existing habitat sites
3. Provide new habitat
4. Maintain habitat

Providing New or Enhancing Habitat - Planting Layout

- Planting in Larger Flower Groupings ~3ft in diameter of an individual species
 - o Flower Constancy: Bees will repeatedly visit one particular plant species on any given foraging trip. Important because then pollen isn't wasted by getting delivered to the wrong species of flower.
- Flight Distance

Providing New or Enhancing Habitat - Flower Characteristics

- Large Landing Pads
- Many Small Flowers
- Blooms Very Early
- Blooms Very Late

Providing New or Enhancing Habitat – What Not to Plant

- Natives vs. Nativars & Non-Natives
- No Double Flowers
- No Purple Leaves
- No Variegated Foliage

Providing New or Enhancing Habitat - Diversity & Bloom Succession

- VERY important to provide a continuous food supply!
- Choose at least 3 different plants within each season

*Many more plants beyond these short lists!

Spring Pollinator Plants

- Amsonia, Baptisia, Geranium, Goatsbeard, Heuchera, Nepeta, Penstemon, Spiderwort

Summer Pollinator Plants

- Butterfly Weed, Coneflower, Joe Pye Weed, Leadplant, Liatris, Monarda, Rattlesnake Master, Salvia

Fall Pollinator Plants

- Anemone, Aster, Goldenrod, Helenium, Helianthus, Obedient Plant, Rudbeckia, Vernonia

Rusty Patched Bumble Bee

- *Bombus affinis*, first insect to be listed as an endangered species in March of 2017 under the U.S. Endangered Species Act. Several were spotted at Olbrich Botanical Gardens and the University of Wisconsin Arboretum!
- Plant highlight for bumble bees: *Baptisia spp.* or False Indigo

Leafcutter Bees

- All are solitary nesters that find pre-existing cavities, either abandoned beetle tunnels, hollow stems, etc.
- Female cuts pieces of leaves to construct their brood cells. The female can cut a piece of leaf in less than 3 seconds!
- Plant highlight for leafcutter bees: *Cercis canadensis* or Redbud

Carder Bees

- Use their sharp mandibles to harvest hairs from fuzzy plants species
- They card or comb it off, similar to carding wool – they use these hairs to line their brood cells.
- Plant highlight for carder bees: *Tradescantia* or Spiderwort

Polyester or Cellophane Bees

- Secrete a cellophane-like material for the lining of their brood cells, this creates a completely waterproof lining – hence polyester bees.
- Very short flight distance or range, can only fly approximately 500 feet
- Plant highlight for polyester bees: *Dalea purpurea* or Purple Prairie Clover

Mason Bees

- Some of these bees have dark, metallic blue-green bodies. Very important for pollinating crops, fast and energetic fliers.
- Similar to leafcutter bees, they nest individually in pre-existing cavities. The name "mason bee" comes from the bees practice of transporting mud to nesting area to line their brood cells and create the different compartments.
- Plant highlight for mason bees: *Allium spp.* or Ornamental Onion or Chives

Yellow-Faced or Masked Bees

- These bees have “masks” on their faces, are hairless and are often mistaken for wasps.
- Females carry pollen internally, instead of transporting it on their legs or abdomens like most bees.
- Weak mandibles make them unable to excavate their own nests, as a result, nest in pre-existing cavities. Hylaeus is Latin for “of the woods.” They prefer woody nest materials, such as sumac or elderberry, also often found in woodland habitats.
- Plant highlight for yellow-faced or masked bees: *Sambucus spp.* or Elderberry

Carpenter Bees

- Carpenter bee species can be quite common and are the only bee that can tunnel into wood. There are just a few species of carpenter bees in Wisconsin. Key pollinators of early spring blooms, such as: hepatica, claytonia & violets.
- Female carpenter bees typically nest inside of hollow twigs and plant stems. They will dig out the soft, center pith to create a tunnel.
- Plant highlight for carpenter bees: *Silphium perfoliatum* or Cup Plant

Providing New or Enhancing Habitat - Nesting Habitat

- 70% are Ground Nesters
- 30% are Cavity Nesters

List of Hollow Stemmed Plants

- Joe Pye Weed (Eupatorium)
- Cup Plant (*Silphium perfoliatum*)
- Fleecflower (*Persicaria*)
- Upright Stonecrop (*Sedum*)
- Bamboo (*Fargesia*)
- Forsythia (*Forsythia*)
- Sunflower (*Helianthus*)
- Ornamental Onion (*Allium*)
- False Indigo (*Baptisia*)
- Ornamental Grasses
 - o Switchgrass (*Panicum*)
 - o Big Bluestem (*Andropogon*)

What is a native bee house?

- Bee houses are essentially artificial nest sites
- Made by drilling holes in dry logs or blocks of wood or by artfully arranging hollow stemmed plants
- Many big examples, research shows that smaller is better (solitary bees, less disease transfer, etc.)
- Creative Native Bee House Workshop @ Olbrich Botanical Gardens this summer! Stay tuned to our website for date!

RESOURCES:

All books below are available for Olbrich Members to check out at Olbrich's Schumacher Library along with an assortment of other garden related books! You can become a member by stopping by our booth #132-134.

The Bees In Your Backyard

by Joseph S. Wilson & Olivia Messinger Carril
ISBN 978-0-691-16077-1

Pollinator Friendly Gardening

by Rhonda Fleming Hayes
ISBN 978-0-7603-4913-7

100 Plants to Feed the Bees

by The Xerces Society
ISBN978-1-61212-701-9

Attracting Native Pollinators

by The Xerces Society
ISBN 978-1-60342-695-4

The Bee Book

by Fergus Chadwick
ISBN 978-1-4654-4383-0

Pollinators of Native Plants

by Heather Holm
ISBN 978-0-9913563-0-0

PLANTING FOR POLLINATORS:

Selecting Plants for Pollinators: Eastern Broadleaf Forest

<http://pollinator.org/PDFs/Guides/EBFContinentalrx13FINAL.pdf>

Planting for Pollinators: USDA Forest Service

<https://www.fs.fed.us/wildflowers/pollinators/gardening.shtml>

The Xerces Society: Pollinator Plant Great Lakes Region

http://www.xerces.org/wp-content/uploads/2014/03/GreatLakesPlantList_web.pdf

POLLINATOR INFORMATION & BEE IDENTIFICATION:

Pollinator Partnership

<http://pollinator.org/>

Xerces Society - Native Bee Biology

<http://www.xerces.org/pollinator-conservation/native-bees/>

Bumble Bee Watch

<https://www.bumblebeewatch.org/>