

The Buzz on Designing Pollinator-Friendly Landscapes

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SLIDE LIST:

1. Importance of pollinators:

- 20,000 - Number of bee species, worldwide
- 75% - Percentage of the world's food crops that depend at least in part on pollination (Klein et al. 2007)
- \$235-577 billion - Annual value of global crops directly affected by pollinators
- 300% - Increase in volume of agricultural production dependent on animal pollination in the past 50 years (Aizen and Harder 2009)
- 39% - Percentage of pollinator-dependent crop area in the U.S. that suffers from a mismatch between supply of wild bees and the need for their pollination services (Koh et al. 2016)
- 90% - Percentage of wild flowering plants that depend on animal-mediated pollination (Ollerton et al. 2011)

2. Restoring Habitat/Floral Resources:

- Preserving and/or restoring pollinator habitat can improve bee abundance, richness, and productivity, even in landscapes with little natural habitat (Williams and Kremen 2007; Ricketts et al. 2008; Garibaldi et al. 2013; Nicholls and Altieri 2013).

3. Goal for restoring pollinator habitat: provide floral resources (nectar/pollen = food), nesting sites for solitary bees, and protection from weather extremes and pesticide exposure.

4. Bees are the most prolific and efficient pollinators, but other pollinators include butterflies, moths, hummingbirds, flies, beetles, wasps, and ants.

5. Native Species: A plant that is a part of the balance of nature and has developed over hundreds or thousands of years in a particular region or ecosystem. Native Cultivar: A variation of a native species, deliberately selected, cross-bred or hybridized for desirable characteristics that can be maintained by propagation.

6. Native species are often difficult to find in retail garden centers. Native cultivars dominate the market and are still typically marketed as native species.

7. Goal of PhD research: evaluate whether native plant cultivars can provide the same ecological value as native species for pollinators in pollinator habitat restorations. Of the 11 cultivars evaluated in our first study, 6 cultivars were significantly less attractive to all pollinators (combined), 1 cultivar was preferred over the species, and 4 cultivars were just as attractive than the species. In a second study, 3 *Echinacea* cultivars were less attractive than the species. Preferences of different pollinator species/pollinator groups varied. Less attractive cultivars =

Achillea 'Strawberry Seduction,' *Agastache* 'Golden Jubilee,' *Baptisia x varicolor* 'Twilite Prairieblues,' *Echinacea purpurea* 'White Swan,' *Echinacea* 'Pink Double Delight,' *Echinacea* 'Sunrise,' *Helenium* 'Moerheim Beauty,' *Symphotrichum novae-angliae* 'Alma Poetschke,' *Tradescantia* 'Red Grape.' Equally attractive cultivars = *Asclepias tuberosa* 'Hello Yellow,' *Monarda fistulosa* 'Claire Grace,' *Penstemon digitalis* 'Husker Red,' *Rudbeckia fulgida* 'Goldsturm.' More attractive cultivar = *Veronicastrum virginicum* 'Lavender Towers.'

8. *Symphotrichum novae-angliae* vs. *S. novae-angliae* 'Alma Poetschke.' Highly significant preference for the species. About 20 times more pollinators were observed foraging on the flowers of the native species versus the cultivar. (Both resources were equally available.)

9. Ornamental hybrids of *Lobelia cardinalis* (hummingbird pollinated) and *Lobelia siphilitica* (bumblebee pollinated) have nectar production similar to *L. siphilitica*. *L. x speciosa* 'Fan Scarlet' is marketed as a hummingbird-friendly plant, but only has 15% of the nectar energy that is available in *L. cardinalis*.

10. Be cautious of native cultivars as substitutes for native species. Not all cultivars of native plants are as attractive to pollinators as the native species. Consider the advantages/disadvantages of each. Avoid double-flowered varieties and be cautious of hybrid varieties. Choose cultivars that are most similar to the species in flower color, size, shape, and bloom period.

11. For professionals, the most important aspect of starting a pollinator-friendly landscape design project is to know your clients (how tolerant will they be of the less manicured aesthetics of ecological landscape design) and what are the goals of the project (full ecological restoration versus editing an existing ornamental landscape).

12. Numerous lists are available for pollinator-friendly plants. Keep in mind that these are very generalized list. Your observations are valuable!

13. Design tip #1: Plant a variety of flower shapes & sizes. Different pollinator species have different floral preferences.

14. Design tip # 2: Diversify bloom times. Early and late bloomers are particularly important.

15. Design tip #3: Color counts! Bees tend to be attracted to purples, yellows and whites. Bees have difficulty distinguishing red from green. Red flowers attract more hummingbirds and butterflies. Some flowers have special markings called "nectar guides" that help lure and guide pollinators to the nectar source.

16. Design tip #4. Avoid double-flowered variations of flowering plants, such as roses, zinnias, asters, Echinaceas, etc.

17. Design tip #5. Include more native plants. Pollinators prefer, but not necessarily exclusively, to forage on the nectar and pollen from native plants (Memmott and Waser 2002; Harmon-Threatt and Kremen 2015; Morandin and Kremen 2013; Morales and Traveset 2009).

18. Design tip #7: Include host plants for Lepidopteran (moths/butterflies). For plant lists visit www.bringingnaturehome.net.

19. Design tip #8: Use flowering plants that have not been treated with systemic insecticides, such as neonicotinoids.
20. Design tip #9: Minimize lawn; maximize flowering plants and natural areas.
21. Design tip #10: Invert the relationship between your lawn and planting beds. Hint: Think of your lawn as an area rug, not as wall-to-wall carpeting.
22. Design tip #11: Consider over-seeding white clover into lawn areas. Also consider violets (*Viola pedata*) and wild strawberry (*Fragaria virginica* and *F. vesca*).
23. Design tip #12: Plant in masses. Bee pollinators prefer to collect nectar/pollen from a single species of flower during each foraging outing. Planting in masses ensures pollinators can practice “flower constancy.” Group a minimum of 5-7 plants of the same species together.
24. Design Tip #13: Use the best microclimates for pollinators. These include good southern and eastern sun exposure, good soil drainage, protected from prevailing winds, and protected from agricultural sprays.
25. Design Tip #14: Include a nearby water source. Add stones to bird bath for easier access.
26. Design Tip #15: Enhance nesting opportunities for ground-nesting bees (~70% of all native, solitary bees). Preserve areas that are bare or sparsely vegetated and have well-drained soil. Minimize wood mulch and consider alternatives such as increasing planting density or using leaf mulch.
27. Design Tip #16: Enhance nesting opportunities for cavity-nesting bees (~30% of all native, solitary bees). Preserve dead or dying trees and shrubs. Leave grass bunches and pithy stems in the garden through the winter. Consider nesting boxes.
28. Design Tip #17: Cutback in the spring, not the fall. Leaving vegetation intact through the winter provides nesting habitat for bees and other beneficial insects.
29. Design Tip #18: Advertise your efforts! Signage can add perceptual purpose to the landscape and can help educate passersby.
30. Design Tip #19: Loosen up; make peace with time. All of our pruning, mowing, and mulching are acts of defiance against nature and the march of time.