

Flowers for Pollinators

Are annual flowers attractive to insect pollinators?

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UNIVERSITY OF MINNESOTA EXTENSION

The issue

Bees and other insects play a critical role in sustaining our food system, plant diversity, and environmental health. Citizens are eager to plant pollinator-friendly gardens, but some may only have space suitable to annual plantings especially in urban landscapes, community garden plots and high-density housing as well as container gardens and some commercial ornamental landscapes. Annual flowers would fit the bill, but do they attract pollinators? They provide a wide array of colors, textures, patterns and forms in landscapes, but breeding ornamental qualities can result in flower stamens transformed into showy petals concealing flower parts, resulting in reduced insect interest/ ability to access food. Because of this, annual flowers are sometimes excluded from pollinator-friendly landscapes. However, we observe pollinator activity on various annual flowers and wonder if some are more attractive to pollinators than others. In growing seasons 2015-2017, we recorded pollinator insect activity on annual flower varieties selected for features known to be attractive to pollinating insects. We found *Cosmos* ranked high for bumble bees, *Salvia*, *Zinnia* and sunflowers were frequented by honeybees, and *Rudbeckia*, sunflowers, and *Salvia* attracted other native bees.

Materials and methods

Flower seeds were selected and started indoors, and seedlings planted in masses after threat of frost had passed. During bloom time, each flower variety was observed for pollinator visits (insect landing on a flower) for one minute 1-2 times per week. Pollinators observed and recorded were bumble bees, honey bees, native bees, flies, butterflies/moths, beetles, wasps and others (ants, grasshoppers, stinkbugs, etc.). Time, date, and weather were also recorded.

2015: Student interns recorded pollinator activity at the Minnesota Landscape Arboretum, Chaska, MN, and in the U of M Horticulture display and trial garden, St. Paul, MN.

2016: Master Gardeners conducted the study as their 35th annual trial

- 70 participants recorded pollinators on 24 varieties of *Salvia*, *Zinnia*, *Rudbeckia*, sunflowers, marigolds and snapdragons. Most were grown in home gardens. Alyssum was used a control plant.
- Extension educators provided pollinator ID training and support.
- The project formed the basis of the 2017 educational theme, “Flowers for Pollinators”, developed by educators for Master Gardeners.

2017: Most visited plants were compiled from Y1 and Y2. We added *Cosmos*, dwarf sunflowers, and other varieties. Total: 30 varieties

- 3 sites: U of M Horticulture display and trial gardens, St. Paul and Morris; and Horst M. Rechelbacher Farm (HMR), Osceola, WI.
- St. Paul site was selected as a U of M Living Laboratory
- Data collection was conducted by Weisenhorn, Miller, and Knight
- Citizen science pollinator survey card was available on-site
- Survey “How pollinator-friendly is my landscape?” was developed



Honey bees on *Helianthus annuus* ‘Music Box Mix’, one of the sunflowers studied

Results: Most visited flowers

- **2015:** *Helianthus amarum* ‘Dakota Gold’, *Agastache cana* ‘Heather Queen’, *Salvia coccinea* ‘Flare’ and *Melampodium paludosum* ‘Showstar’.
- **2016:** *H. annuus* ‘Lemon Queen’, *Tagetes* ‘Bambino’, *Rudbeckia* ‘Irish Eyes’ and ‘Orange Fudge’, *S. coccinea* ‘Coral Nymph’, *Salvia horminum* ‘White Swan’, *Zinnia* ‘Envy’ and ‘Pop Art Red & White’.
- **2017:** Specifically visited most often by bees (top four plants each):
 - Bumble bees: *Cosmos* ‘Double take’, ‘Double click’, and ‘Capriola’, *Tagetes* ‘Ivory’
 - Honey bees: *Salvia* ‘White swan’, *H. annuus* ‘Music box mix’, *Salvia* ‘Purple fairy tale’, *Zinnia* ‘Envy’
 - Other native bees: *Rudbeckia* ‘Prairie sun’, *Helianthus* ‘Elf’ and ‘Dwarf yellow spray’, *Salvia coccinea* ‘Coral Nymph’
- Citizen science survey: 14 people reported 90 insect visits between 7/8 – 9/8. Most visited: *H. annuus* ‘Music box mix’, *Zinnia* ‘Envy’ and ‘Swirls’

Discussion

- Annual flower varieties can attract pollinators and should be used to support pollinators in landscapes.
- Annual flowers should be selected and used with special consideration toward providing continual bloom. Remove spent blossoms to promote repeat bloom.
- Honey bees showed a preference to sunflower varieties until blooms faded after which they foraged on other varieties.
- Features such as petal patterns, colors, size and shape may attract pollinators, but not conclusively.
- Taller *Zinnia* varieties like ‘Envy’ were preferred over short varieties like ‘Zahara starlight rose’.

References

Extension Garden / Flowers for Pollinators z.umn.edu/flowersforpollinators
Flowers for Pollinators blog z.umn.edu/flowers
Survey: How pollinator-friendly is my landscape? z.umn.edu/flowers4pollinators
Wisdom, M., “Pollinator Counts on Cultivars of Annual Bedding Plants: An Assessment of Pollinator Preference” z.umn.edu/f402015
University of Minnesota Living Laboratory <https://italladdsup.umn.edu/content/living-lab>

This project was funded in 2017 by the Horst M. Rechelbacher Foundation through U of M PlantED.



L – R: U of M St. Paul Horticulture Display Garden; HMR building, Osceola, WI; U of M Horticulture Display Garden, Morris, MN.