Bee Campus USA - University of Texas at Austin

Report on 2022

Pollinator Habitat Creation & Enhancement

The Beevo Beekeeping Society continued work on its own on-campus pollinator garden at T.S. Painter Hall, which was first developed in 2021. The garden was awarded to the Beevo Beekeeping Society by UT's Office of Sustainability Green Fund… At the start of the year, Beevo coordinated a landscaping event with a UT student organization, the Texas Iron Spikes. A new garden bed was built and native plants were planted, such as sennas and Gregg's mistflower. Several other workdays occurred throughout the year that focused on general maintenance and upkeep of the garden. The garden was watered three times a week by volunteers and Beevo Beekeeping Society members. At the beginning of the Fall 2022 semester, Beevo purchased a 4×8 ft plot at the off-campus UT Microfarm. A group of four members worked together to purchase and plant eight varieties of flowering native Texas plants. These plants include rock rose, Henry Duelberg Sage, and Henry Duelberg Salvia. The plot was maintained on a volunteer basis, with students watering and weeding the plot two times a week. UT Landscape Services (UTLS) has continued to enhance the UT Orchard and Pollinator Garden, planting 5 fruit trees (peach, plum, Texas persimmon, Meyer lemon, pomegranate) with 3 student volunteers in celebration of National Arbor Day. A virtual map with information on trees, plants, and pollinators found here is available at https://storymaps.arcgis.com/stories/a0fe1076937b4b4ab5dad407bdfa21bb. UTLS manages vegetation along Waller Creek. UT Housing and Dining has continued to enhance their own pollinator garden that was created in 2018, hosting plants such as Echinacea, Gregg's Mistflower, Heartleaf Hibiscus, and American Beautyberry. The Texas Swim Center Pollinator Garden, created in 2017, has native shrubs, perennials, and milkweed designed to attract butterflies, bees, and other pollinators. The Dell Medical District Landscape, created in 2017, involved the removal of invasive species, heritage tree preservation, stream bank stabilization, and re-vegetation with a diverse mix of native species. Little Blue Prairie is a Blackland pocket prairie established by the Campus Environmental Center students. Landscape Services now partners with student leaders to select prairie and pollinator plants. The Brackenridge Field Laboratory property is comprised of areas of rich natural vegetation which include a native bluestem prairie, old pasture land, former quarry, Firefly Meadow, Pecan Bottoms, Colorado River and juniper woodlands. This diversity has produced records of thousands of species including at least 163 species of birds, 20 mammals, 373 species of plants, 68 species of ants, and 1200 species of moths and butterflies, and 200 species of native bees.

How many habitat projects did you help to create or enhance last year?

4

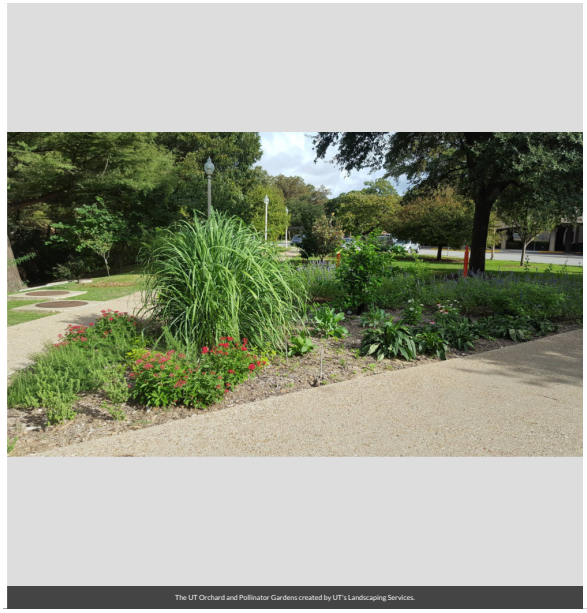
How many total square feet of habitat were created or enhanced?

2200

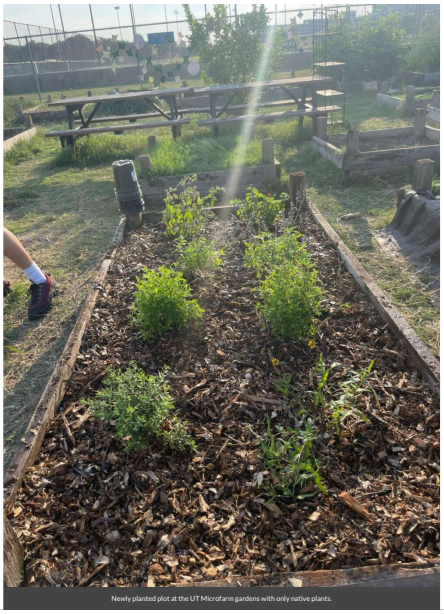
How many volunteers helped with those projects?
75

Please check all that describe the habitats your affiliate helped to create or enhance last year with pollinator benefit in mind.

- Flower garden
- Vegetable garden
- Orchard
- Natural area with tree snags and stumps, and bare areas for ground nesting species
- Pollinator-friendly lawn (with flowering clover, dandelions...)
- Herb garden
- Native milkweed planting for monarchs and bees (where appropriate)
- Invasive/exotic plant species removal for habitat improvement
- Native pollinator-friendly tree planting
- Native pollinator-friendly shrub border/hedgerow planting



The UT Orchard and Pollinator Gardens created by UT's Landscaping Services.



Newly planted plot at the UT Microfarm gardens with only native plants.

Members of Beevo beautifying the Beevo-led on-campus pollinator garden by planting native species.

Education & Outreach

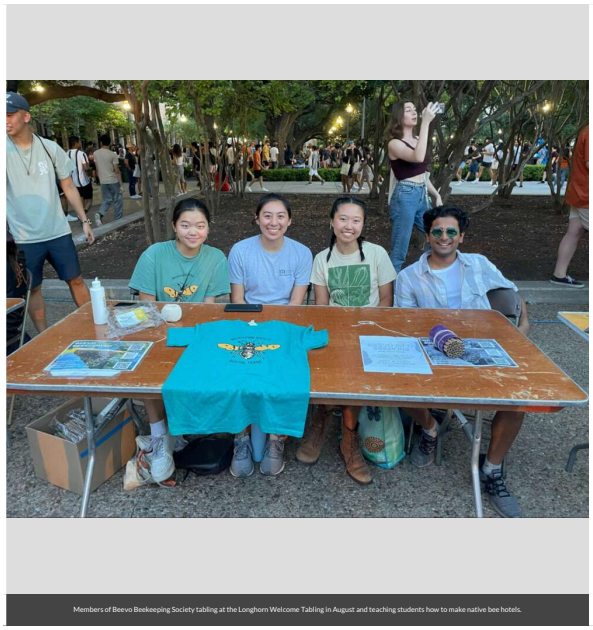
In the fall semester of 2021 the Beevo Beekeeping Society, or Beevo, initiated a partnership with the University of Texas' Farm Stand that was continued throughout 2022. The Farm Stand hosts biweekly farmers market events in the heart of UT campus, where Beevo occupied a table and market-goers could learn about Bee Campus USA, bees, club events, and more. The Beevo table featured poster boards with information and 'trivia' on beekeeping, pollination, sustainability, and conservation. Students could chat with Beevo members about the importance of pollination, and were encouraged to attend our weekly hive checks for experiential learning. Farm Stand draws large crowds of students, between 250-300 each market, and a total of 86 members participated across 10 Farm Stand events. This collaboration is ongoing, with Beevo occupying a permanent pollinator table at the Farm Stand. The Beevo Beekeeping Society also hosted a "Beekeeping 101" event, where members from Beevo and UT's student population were invited to learn the basics of beekeeping. Attendees were taught about different types of beehives, beekeeping equipment, and the biology of honey bees. Attendees were also educated on the different aspects of a hive, such as the honeycomb, brood, and honey. While this event dealt with non-native honey bees and their importance in pollination, attendees were also educated about the general importance of pollination and native pollinators. Throughout the year Beevo was able to learn and share the importance of pollination. Our mentor beekeeper Brandon Fehrenkemp, came to speak twice to share his knowledge of beekeeping and hive check safety procedures. The director of science and conservation at the Lady Bird Johnson Wildflower Center, Dr. Sean Griffin, spoke with us on the importance of native bees and shared his pollinator conservation research. A few members attended a beekeeping class from local beekeepers Two Hives Honey. From these learning experiences, our club members have been able to promote the importance of pollinators even more. In October, Beevo was asked to speak at the Texas Federation of Women's Club as a part of their project focus of 'Protecting the Pollinators'. A member gave a presentation on the importance of bees, pollinator gardens, and what they can do to help bees. In March, two members spoke at the Austin City Council in favor of a resolution making Austin a Xerces BeeCity USA affiliate. We also host weekly hive checks open to anyone in the UT population. Nicole and Laurel collaboratively expanded the UT Bee Campus webpage per Xerces guidelines with input from committee members. The updated webpage promotes inclusivity and invites community participation. Laurel Trevino is the Outreach Program Coordinator for the Jha Lab and Nicole Elmer is the Communications Coordinator for the CNS Biodiversity Center

How many pollinator-related events did your affiliate host or help with last year (in total)?

11

How many people attended those events (in total)?

400



Members of Beevo Beekeeping Society tabling at the Longhorn Welcome Tabling in August and teaching students how to make native bee hotels.

Two members of the Beevo Beekeeping Society in front of City Hall after speaking in favor of passing the initiative to make the City of Austin BeeCity USA Certified, alongside Erika Thompson of Texas Beeworks.

Beekeeping 101 open to any student interested in beekeeping, bees, and pollinators hosted in the fall.

Courses & Continuing Education

UT offers a variety of course both for sustainability-related majors and nonmajors. One of the largest classes, Introductory Biology II, is commonly taken by a wide variety of majors and is offered every semester with relatively large class sizes. Part of the curriculum includes plant biology and pollinators. Another class is BIO 377, an undergraduate research course in which students do research into the microbiomes of pollinators such as carpenter bees and wasps and present their research at the Undergraduate Research Forum. There are a wide variety of for-credit courses offered for environmental science majors. These include several lab classes that allow students to get hands-on experience in the field learning about pollinators. UT's Brackenridge field lab offers opportunities for undergraduates, graduate students, and fellows to study and research pollinators. The field lab provides natural spaces for researchers to study pollinators and their habitats. UT also has access to the Lady Bird Johnson Wildflower Center field station where students can do hands-on learning and research. In BIO 359K, Dr. Muth has created a hands-on "bee learning lab" as part of her Animal Behavior Class where students learn about how bees work and what conditions are most suitable for bee survival and function. Laurel Trevino, who is a coordinator in the College of Natural Sciences and part of the UT Austin Bee Campus Committee also provides series of non-academic courses in collaboration with the Lady Bird Johnson Wildflower Center.

How many of your for-credit courses included pollinator-related information last year?
17

How many students attended those for-credit courses?
800

How many of your continuing education courses included pollinator-related information last year?

2

How many participants attended those courses?

100

Members of Dr. Nancy Moran's lab at the Entomological Society of America 2022 Joint Annual Meeting.

Background: learning in bees
Honeybees and bumblebees visit many types of flowers to collect nectar and pollen. Within a day, a single foraging bee may visit thousands of flowers. As such, bees are excellent at learning which flowers offer the best nectar, and can learn to associate a number of floral features with a nectar reward.

Today, you're going to use a learning assay to determine whether 'color' (specifically, hue) is one of the features of a flower that bees can learn.

For this activity, you will need:

1. **A bee in a tube.** *Be careful not to shake or jostle it as you place it carefully in your work space. Upset bees are bad learners.*
2. **A timing device.** *Use your watch or cell phone.*
3. **Two tubes of solution:**
    1. One containing **50% sucrose** *(the "nectar" reward,* a unconditioned stimulus or US+*)*
    2. One containing **water** *(the "punishment",* the US-*)*
4. **Colored strips of paper** *Blue and yellow*
    1. One color will be the 'rewarding' color (the conditioned stimulus or CS+), the other will be the 'punishing' color (the CS-)

Training Overview: Each bee will be given 6 training bouts and one test bout.

Your bee will be trained that **BLUE** is rewarding and **YELLOW** is punishing
NOTE: this could be different to what your neighbor is doing.

You will use your datasheet to record the behaviors of your bee.

For training:

1. Write down the time you start the first training on your datasheet, and perform each subsequent bout of training 5 minutes after the last.
2. For each training bout for each bee, stick the correctly colored strip of paper into the reward solution. Make sure that the strip is wet, but not dripping.
3. Gently push the sucrose-dipped strip through one of the holes at the end of the tube.
4. When the bee sticks out her proboscis ("tongue") to taste the reward, allow her to drink for 3 seconds, before removing the strip of paper.
5. Now dip the 'punishing' strip into water, and stick it through the same hole at the end of the tube.
6. After she sticks out her proboscis, give her 3 seconds and then remove it.

Always start a training bout with the reward, not the punishment!!!

An example of a lab students participate in in BIO 359K from Dr. Muth's lab.

Service-Learning

The Beevo Beekeeping Society volunteered at the Austin Nature and Science Center's pollinator garden workday in celebration of the Austin Park's Foundation's "It's My Park Day." The Texas Lassos, a student organization at the University of Texas, was also in attendance and collaborated with Beevo Beekeeping Society on the workday event. The group of volunteers helped in the maintenance and upkeep of their two pollinator plot, including the removal or dead and invasive plants, soil tilling, the planting of new, native plants, and watering. In February of 2022, several members of the Beevo Beekeeping Society attended a landscaping learning day at the Elisabet Ney Mueseum, alongside members of the general public. At the event, volunteers pruned dormant plants and collected and dispersed of seeds from native plants. An

employee of the museum led an educational lecture, where attendees learned about native flora and fauna within the Austin area. In March 2022, Austin City Council unanimously passed a resolution making Austin a certified Xerces BeeCity USA. Two members of Beevo Beekeeping went and spoke at the city council meeting to advocate for this resolution.

How many service-learning projects did your campus host and/or support to enhance pollinator habitat on and off-campus?
7

How many students participated in service-learning projects last year to enhance pollinator habitat on or off-campus?
140

Members at a landscaping learning day participating in seed dispersal and pruning.

Members of the Beevo Beekeeping Society planting native plants in the Austin Nature and Science Center pollinator garden.

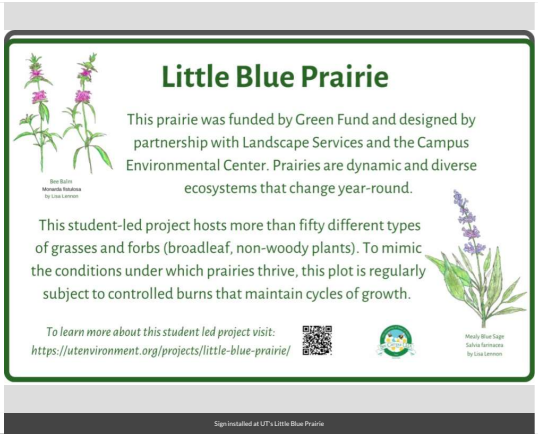
Educational Signage

We are in the process of working with UT's signage regulations to put up more educational and Bee Campus USA signage.

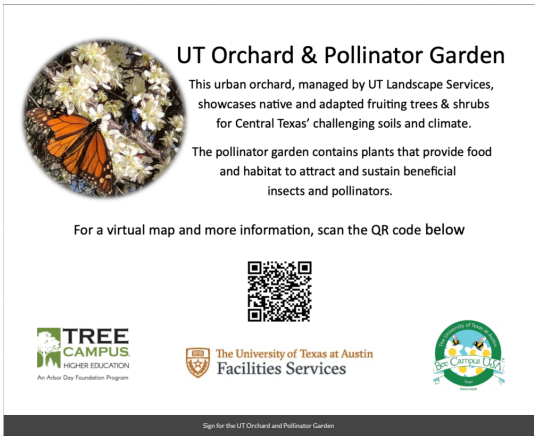
Number of permanent interpretive/educational/Bee Campus USA signs installed to date?

1

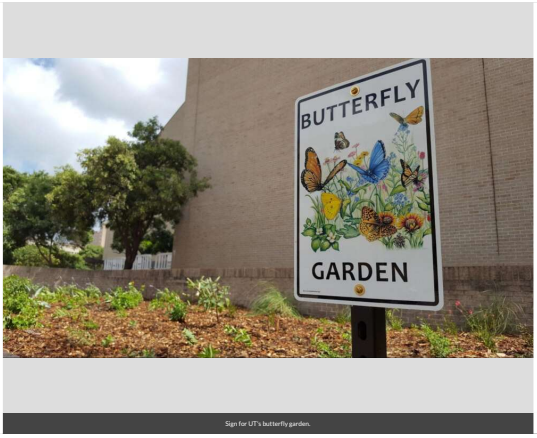
Number of temporary interpretive/educational/Bee Campus USA signs installed last year?



Sign installed at UT's Little Blue Prairie



Sign for the UT Orchard and Pollinator Garden



Sign for UT's butterfly garden.

Policies & Practices

The University of Texas at Austin has successfully maintained our integrated pest management (IPM) plan, drafted and proposed in 2020. This plan features actions such as selecting appropriate turf species for certain areas, providing good drainage, inspecting land for pests and diseases, testing soil, and striving for a diversity of plant species. Our campus has upheld standards set by the IPM, including avoiding use of pesticides in public sites containing designated pollinator habitat or other sensitive features (except when targeted use is deemed the best option for invasive or noxious weed, insect or disease management), implementing non-chemical pest prevention and management methods on city of campus grounds, eliminating pesticides that are solely used to maintain aesthetics on city or campus grounds, reducing the total area of city or campus-managed lands where pesticides are applied, restricting pesticide use to organic pesticides on city or campus grounds, eliminating use of neonicotinoid insecticides on city or campus grounds, dropping pesticide use altogether on city or campus grounds, distributing educational materials to residents or students to encourage the reduction or elimination of pesticide use, sourcing plants for city or campus grounds using "Buying Bee-Safe Plants" methods recommended by Xerces Society (see https://xerces.org/publications/fact-sheets/buying-bee-safe-plants), sourcing plants for city or campus grounds that were not treated with neonicotinoids, encouraging developers and private landscapers to source plants using "Buying Bee-Safe Plants" methods recommended by Xerces Society (see https://xerces.org/publications/fact-sheets/buying-bee-safe-plants), and encouraging developers and private landscapers to source plants that were not treated with neonicotinoids.

What actions have you taken to make pest management practices more pollinator-friendly?

- Implemented or maintained a written IPM plan
- Avoided use of pesticides in public sites containing designated pollinator habitat or other sensitive features (except when targeted use is deemed the best option for invasive or noxious weed, insect or disease management)
- Implemented non-chemical pest prevention and management methods on city or campus grounds
- Eliminated pesticide uses that are solely to maintain aesthetics on city or campus grounds
- Reduced the total area of city or campus-managed lands to which pesticides are applied
- Restricted pesticides used to organic pesticides on city or campus grounds
- Eliminated use of neonicotinoid insecticides on city or campus grounds
- Distributed educational materials to residents or students to encourage the reduction or elimination of pesticide use
- Sourced plants for city or campus grounds using "Buying Bee-Safe Plants" methods recommended by Xerces Society. (See https://xerces.org/publications/fact-sheets/buying-bee-safe-plants)
- Sourced plants for city or campus grounds that were not treated with neonicotinoids
- Encouraged developers and private landscapers to source plants using "Buying Bee-Safe Plants" methods recommended by Xerces Society. (See https://xerces.org/publications/fact-sheets/buying-bee-safe-plants)
- Encouraged developers and private landscapers to source plants that were not treated with neonicotinoids

In your city or campus, are any policy initiatives underway to further protect pollinators, people or waterways from pesticides?
Austin becoming BeeCity; PollinATX; Imagine austin comprehensive plan https://www.austintexas.gov/edims/document.cfm?id=376827; Austin Invasive Plants Management; Austin Watershed Master plan in effect

Please describe actions by your affiliate to attend training on ecologically-based Integrated Pest Management and/or to review IPM plans and programs considered of high quality by Bee City USA?
The IPM plan that UT implements was designed in collaboration with Bee Campus USA committee members in the Integrative Biology Department. Landscaping services also integrates the Texas Parks and Wildlife Texas Monarch and Native Pollinator Plan established in 2016 and partners with the Lady Bird Johnson Wildflower Center. Additionally, the Beevo Beekeeping Society encourages members to attend non-UT Austin events that discuss landscaping for

pollinators and how to care for native plants and ecosystems.

Integrated Pest Management Plan: IPM Plan Jim Carse.pdf
https://utexas.app.box.com/s/zud883x94gyr8g9fhi2568ls9ayn847h
Recommended Native Plant List:
https://utexas.app.box.com/s/6qlr5p6davd6591slblgh717on501eqm
Recommended Native Plant Supplier List: Native Plant Supplier List.xlsx
https://utexas.app.box.com/s/6qlr5p6davd6591slblgh717on501eqm

Before and after photos of a landscaping project around a campus kiosk (not 2022) demonstrating how our campus utilizes extra space to provide pollinator habitats.

Learn More

BEE CAMPUS USA
AN INITIATIVE OF THE XERCES SOCIETY

XERCES SOCIETY
for Invertebrate Conservation

Members of UT's Bee Campus USA committee meeting to discuss pollinator friendly initiatives on campus.

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