

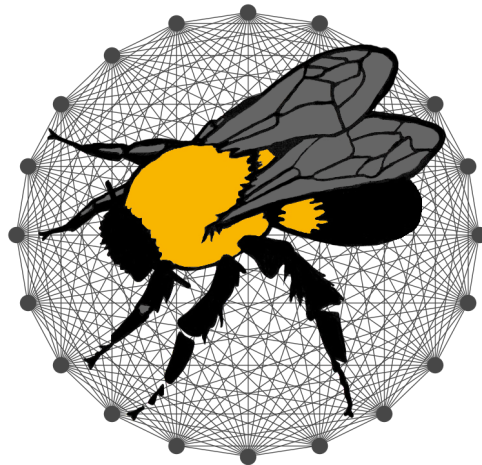


Bee Campus USA Annual Report Pollinator Conservation & Education 2019



The University of Vermont Burlington, Vermont

EDUCATION & OUTREACH



The Vermont Bee Lab was established at The University of Vermont and resides in the Department of Plant and Soil Science. The lab is dedicated to the protection of pollinators through research, education, and outreach.

2019 was a very busy year for pollinator research, education, and outreach activities at The University of Vermont (UVM). The Gund Institute for Environment received a significant donation to establish a center for improving pollinator health (<https://www.uvm.edu/gund/apis-fund>).

Dr. Samantha Alger secured funding to establish the Vermont Bee Lab which will strive towards improving pollinator health through education, research and outreach (<http://www.vermontbeelab.com/>).

Dr. Alger's research on a possible adverse impact of domesticated bees on wild bee health was disseminated globally through a variety of new media outlets.

The UVM Beekeepers Club had many activities on campus to foster awareness of honeybees and other pollinators. The club has over 1,000 current students on their listserv and is one of the most recognized clubs on campus. They are now part of a consortium of other clubs on campus dedicated to improving the local, regional, national and global environment under the guidance of the UVM Student Government Association.



A \$500K gift to The University of Vermont (UVM) established this fund to protect and study pollinators.



Dr. Samantha Alger's research on "How honeybees may infect bumblebees through shared flowers" is picked up by international media outlets including: The Daily Mail (UK), The Independent (UK), Earth.com, Grist, IFLScience!, Inverse, PBS News Hour, and ScienceDaily.



The University of Vermont Beekeeping Club put an observation hive on display at the First Year Student Picnic and Club Fair to recruit new members.



Dr. Steve Flemer (Chemistry Professor at UVM) shares his beekeeping knowledge with members of the campus community.

Education & Outreach Activities Included:

Winter Activities Fest (January 23); UVM Beekeepers attended the Addison Co. Beekeepers talk on Varroa mites in Middlebury, VT (February 20); Hosted "Jeopardy" - bee knowledge quiz game (February 25); Beeswax sandwich wrap-making event (February 27); \$500K APIS Fund for pollinator health established at UVM Gund Institute for Environment (March 5); Hive frame-building workshop (March 25); Beekeepers chair painting @ the Davis Student Center (April 5); Pollinator Garden Clean-up at Jeffords Hall and Filling jars with the Club's honey from their apiary on campus for the College of Agriculture and Life Sciences Alumni and Friends Dinner (April 13); Bulb planting by the club members at Burlington Police Station (April 20); Dr. Samantha Alger presenting a talk at the Southern Adirondack Beekeepers Meeting, "How honeybees may infect bumblebees-through shared flowers" (May 20); Dr. Samantha Alger's research on "How honeybees may infect bumblebees-through shared flowers" is picked up by international media outlets including: The Daily Mail (UK), The Independent

(UK), Earth.com, Grist, IFLScience!, Inverse, PBS News Hour, and ScienceDaily (June 26); UVM Beekeepers at the First Year Welcome Picnic and Club Fair (August 24); John Hayden leads a tour of the Pollinator Gardens for the course, "Landscape Design for Pollinators" (August 26); UVM Beekeepers at the Fall Activities Fest (September 4); UVM Graduate student-Alex Burnham presents, "Flowers as dirty doorknobs: Virus transmission through flowers depends on floral diversity" at Apimondia conference in Montreal (September 9); UVM Beekeepers first meeting (September 9); Vermont Beekeepers Association workshop - preparing your hives for winter hosted by the UVM Entomology Research Unit - Department of Plant and Soil Science (September 21); Beekeeping 101 presentation (September 23); The Vermont Bee Lab is established - The Lab is a research and outreach laboratory located at the University of Vermont dedicated to the protection of pollinators through research, education and outreach (October 3); Pollinator Garden Workday - Friends of the UVM Horticulture Farm (October 12); Seed Bomb-making for dispersal in the pollinator meadow garden by the UVM apiary (October 21); Planting perennials in the apiary meadow garden (October 26); The UVM Beekeepers brought the movie, "The Pollinators" to The Roxy Theater in Burlington, VT for general public screening (November 6); Honey extraction from the UVM Beekeepers apiary (November 16); Bee Campus Advisory Committee meeting (December 9).

POLLINATOR HEALTH & HABITAT



The UVM Beekeepers Club and the UVM Horticulture Club joined forces to plant native and dry-upland pollinator-friendly perennials in the meadow adjacent to the apiary on campus.

May-September - Installation and maintenance of pollinator "pocket gardens" around Jeffords Hall on campus by the UVM Horticulture Club, UVM Beekeepers, summer gardening interns and Vermont Master Gardeners. These pocket gardens included many native plants to enhance bee and butterfly pollinator food sources on campus. Also planted for the first time were "pollinator strips" that included native, pollinator-friendly plants adjacent to the managed crop areas at the UVM Horticulture Research and Education Center (<http://www.uvm.edu/~hortfarm/>).

October - The UVM Horticulture Club and UVM Beekeepers continued to plant native and dry-upland perennial plant species in the meadow adjacent to the apiary on campus. This meadow, once all grasses, now includes plants that provide bees, butterflies, and other pollinators with food sources in an area that was otherwise very limited in these resources. The enhancement of the meadow garden will be an ongoing effort in the coming years. The UVM Horticulture Club and the UVM Beekeepers, along with summer interns and Vermont Master Gardeners worked to install and maintain numerous pollinator-friendly gardens on campus. These gardens incorporate a variety of early, mid-, and late

season blooming native plants to improve the biodiversity of plant species and thus pollinator species on and around campus. The latest endeavor on campus was the installation of a new pollinator-friendly garden on a site used for staging of construction equipment for a new wing of the UVM Medical Center.



Milkweed plants were added to many of the pollinator “pocket gardens” on campus..



Dr. Terry Bradshaw (Director of the UVM Horticulture Research and Education Center) discusses the addition of “pollinator strips” along the edges of the cultivated crop areas at the facility.



After construction was completed on the UVM Medical Center, the staging area for construction equipment was landscaped to include a new pollinator-friendly “pocket garden”.



A new pollinator “pocket garden” was added to the area near the Rubenstein School of the Environment and Natural Resources.

SERVICE LEARNING



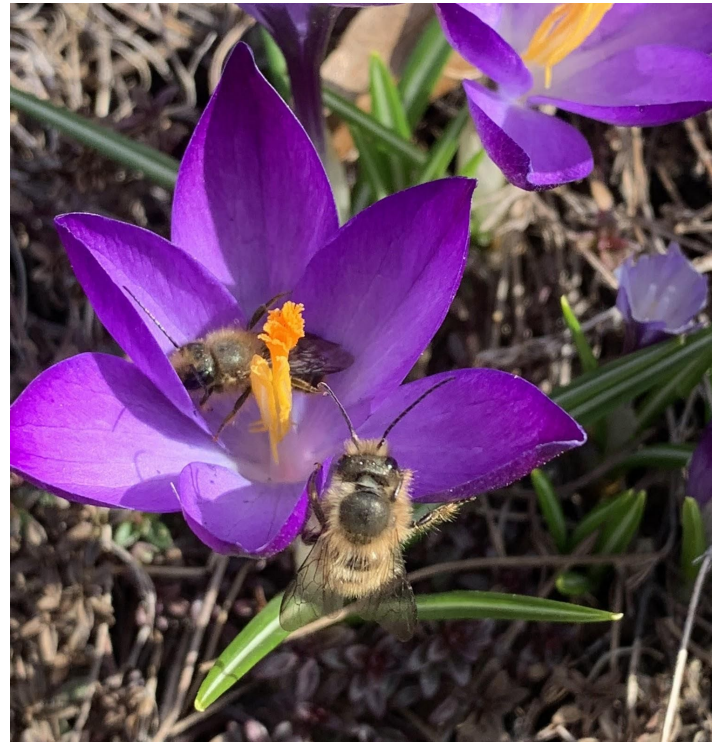
Students in the Home and Garden Horticulture Lab removing weeds and planted additional pollinator-friendly perennials.



Students in the UVM Horticulture Club planted the beds at the Burlington Police Station with an assortment of bulbs.



Students in the Home and Garden Horticulture Lab planting an American Basswood tree on main campus.



Crocus "bulbs" (corms) planted by the UVM Horticulture Club being visited by early-season solitary bees.

This past fall a service learning project was conducted by students in PSS015 Home and Garden Horticulture Lab. We renovated and added perennials to the pollinator "pocket garden" installed last year adjacent to the UVM Dairy and Equine Center. This project involved a total of 16 students and took place over two weeks in the month of October. It is anticipated that each year students in PSS015 Home and Garden Horticulture labs will install and/or maintain pollinator-friendly "pocket gardens" on campus. Students in this lab also planted a native American Basswood (*Tilia americana*) tree on main campus. This is the only tree of this species on main campus and is a noteworthy addition. We will continue to add pollinator-friendly trees on campus.

Additionally, members of the UVM Horticulture Club grew and planted pollinator-friendly species at the Burlington Police Station. This is an annual event that provides the members of the club with an opportunity to engage with the local community in a highly visible off-campus location.

CURRICULUM & CONTINUING EDUCATION



BioCORE students taking counts of pollinator species in the gardens outside of Jeffords Hall.



Dr. Annie White leading a tour of the pollinator garden by Aiken for Permaculture course.

In 2019 there were 15 courses that provided information on topics such as: native plant ecology, pollinator biology, pollinator ecology, integrated pest management, pollinators and agriculture, and/or landscaping for pollinators. These courses included: Biology, BioCORE, Conservation Biology, Diversified Farm Planning, Ecology & Evolution, Ecological Landscape Design, Ecology, Ecosystems & the Environment, Entomology & Pest Management, Field Zoology, Home & Garden Horticulture, Landscape Design for Pollinators, Living Landscapes, Permaculture, and Pollinators & Perennials. Of these courses, only Biology and BioCore are dual-listed as Continuing Education (CE) courses, however, all courses at UVM are open to CE students once matriculated students have had a chance to enroll.



A mix of matriculated and Continuing Education students made up the first beekeeping class at the University of Vermont in 40 years.



Local Farmer and conservationist, John Hayden, leading a tour of the pollinator gardens outside Jeffords Hall as part of Jane Sorenson's course "Landscape Design for Pollinators".



Biology class using the pollinators gardens for one of their lab activities monitoring for pollinators.

EDUCATIONAL & INTERPRETIVE SIGNAGE



This sign indicates the nesting "houses" suitable for native, solitary bees.



Pictured are Sarah Salatino (L) who helped to install the Pollinator Garden at the UVM Horticulture Research and Education Center with Hannah Brill (R) a Sustainable Landscape Horticulture Student intern who helped to create the interpretive signage for the gardens. The signage indicates the seasons that each plant species provides flowers (nectar/pollen) to pollinators.

Due to restrictions on campus, we are limited to the amount of signs we can put up; however, we do have a small sign that provides information about our solitary bee "house" in the arboretum on campus adjacent to Jeffords Hall. This is a permanent display. A temporary sign was put up by the Friends of the Horticulture Farm at the UVM Horticulture Research and Education Center for their "Pollinator Garden" (<https://fhfvt.org/>). This sign showcases the seasons that each species of plants in this garden is providing flowers (pollen/nectar) to pollinators.

Our hope is to be able to create additional signage for our various pollinator gardens on campus in the coming years.

POLICIES & PRACTICES

IPM is a comprehensive, ecosystem-based strategy that focuses on long-term prevention of pests or their damage, through a combination of properly timed techniques such as biological control, habitat manipulation, and modification of cultural practices and use of resistant varieties. This strategy also uses small amounts of organic and/or approved pesticides to minimized pest quantities only after monitoring indicates they are needed. Treatments are undertaken with the goal of controlling only target organisms to an acceptable level in specific areas. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial non-targeted organisms and the environment while protecting landscape aesthetics preventing economic losses.

1. We base our pest management program on preventative, non-chemical and cultural measures for control. These controls begin with selecting healthy, zone hardy, pest resistant species with a focus on proper planting techniques and maintenance practices.
2. When applicable, physical barriers are placed to prevent plant pests from doing repeated damage. Examples include bands around trees to discourage gypsy moth defoliation, wraps around trunks of young trees to prevent damage from rodents or other animals, and boulders or planting beds for turf protection.
3. UVM Grounds staff monitor for pests as they patrol and work on campus, reporting pest activity to Grounds Management. Environmentally friendly or target specific materials are chosen to bring the amount of pest to an acceptable level.
4. Dormant horticultural oils or insecticidal soaps may be applied to manage insects on ornamental plantings when the level of damage threatens plant health or aesthetics.
5. Trees and shrubs are mulched annually with cedar bark, which aids in water retention, blocks weeds, and acts as an insect repellent (through the natural oil and strong fragrance). Most weeds in tree and plant beds are manually pulled and discarded.
6. High quality lawns and athletic fields are aerated to relieve compaction with over seeding and mowing at their optimal heights to ensure health and vigor. Soil nutrient balance is maintained through the use of non-phosphorus, organic fertilizers. Irrigation is used in limited areas and monitored for correct water usage. Heath turf lessens erosion and storm runoff.
7. Many annual flowerbeds are being replaced over time by more sustainable mulched perennial flower beds.

8. UVM maintains an inventory of all campus trees. This inventory, together with our knowledge of the University landscape is used to monitor for insects, disease and environmental stresses and aids us in our maintenance efforts.

Recommended Locally Native Plant Species List —

<http://vermontlakes.org/lakescaping-2/six-native-plant-lists/>

Regional Native Plant Supplier List — www.northeastpollinator.com &

<https://www.uvm.edu/sites/default/files/Agriculture/Vermont-Suppliers-for-Native-Plants-and-Seeds.pdf>

Pollinator Friendly Integrated Pest Management Plan —

<https://www.uvm.edu/physicalplant/integrated-pest-management-ipm-plan>

CONTACT US!

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Website — <https://www.uvm.edu/physicalplant/grounds-services>

Social Media — <https://www.facebook.com/groups/uvmbeekeepers/>