Supporting Native Bees in Utah

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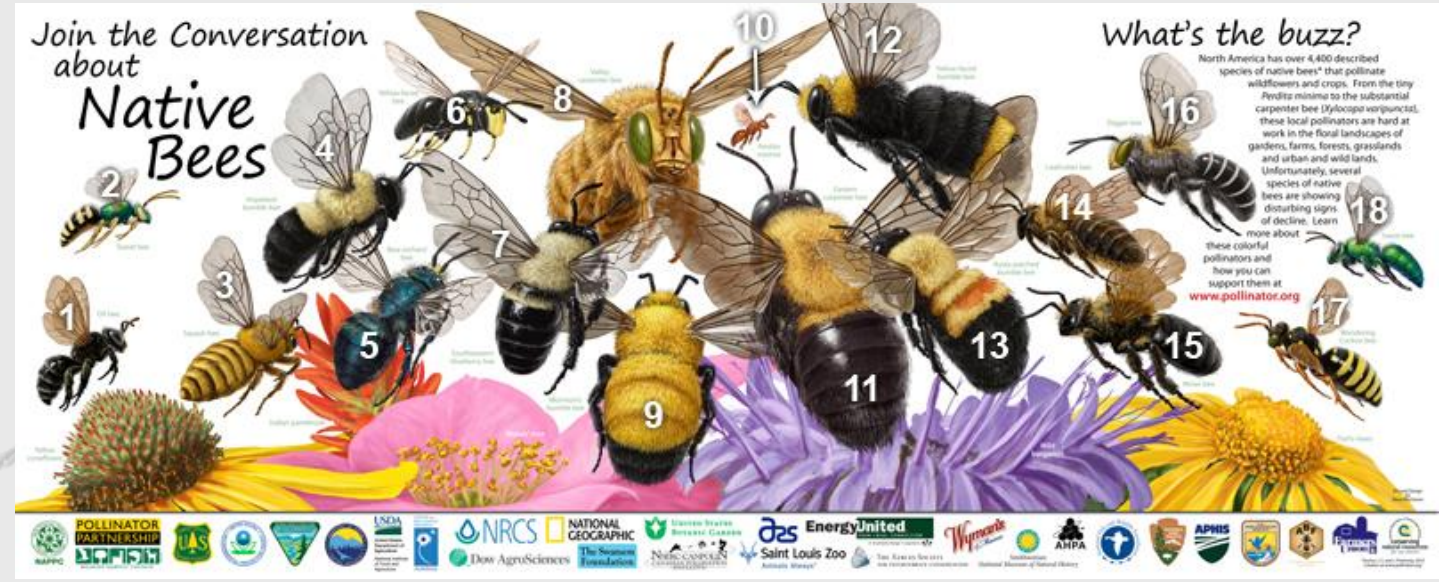
What is a Native Bee?

- Native means indigenous to a location: Utah
- These bees were not imported like the European Honey Bee
- Typically smaller than honey bees
- Most often are solitary, not social

Utah's Native Bees

- Utah is a BEE HOT SPOT
- Over 1,000 species of native bees have been identified in Utah
- Southern Utah has as many native species as the entire eastern U.S. coast

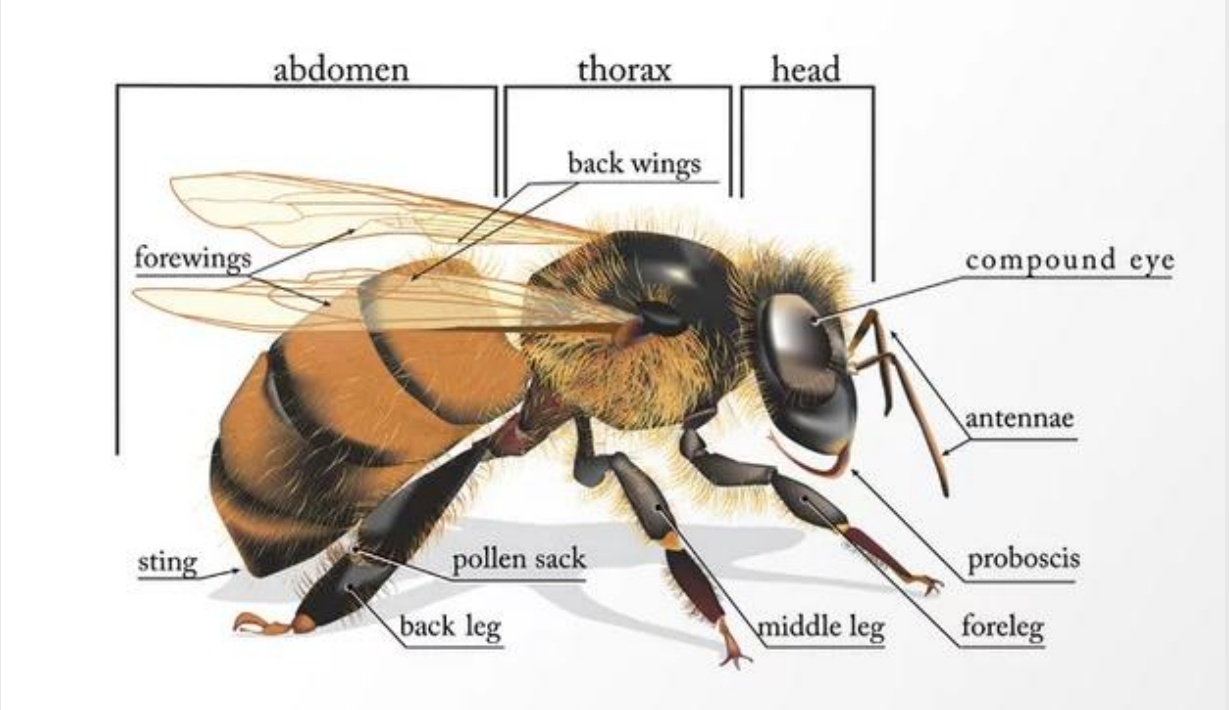


The Importance of Native Bees

- Native bees are excellent pollinators
- Vastly improve crop yields
- They can improve soil and plant diversity

Bee Identification

- Identification is important
- Bees are insects
  - 3 pairs of legs
  - 3 body segments
  - 2 pairs of wings
- Bees sense the environment with chemoreceptors found on antenna, head, legs, etc.



Bee Mimics

- There are some flies that mimic bees in appearance
  - Broadened thorax and abdomen
  - Two wings
- Several hornets and wasps can also look like bees to the untrained eye
  - Lack pollen baskets on legs
  - Thin waists (usually)
  - Less hair, more shiny

Photos: Joe Wilson, USU

Social vs. Solitary

- Social bees
  - Work together
  - Nest in hives
  - Have different roles
- Solitary bees
  - Single bee
  - Ground or cavity nesting
  - Performs all tasks needed

Ground Nesting

- Ground nesting
  - 70% of bees build nests by digging in the ground
  - Each species has a preferred soil texture
  - Can be shallow or up to 10-feet deep
- Dawson's Bees Video (0:51)
- Photo: alkali bee nest aggregation

Cavity Nesting

- Wood and pith nesters
  - Build nests in solid wood, pithy stems, and other similar materials
  - Raspberry and blackberry stems, weed stems

Architects

- Bees construct nests from:
  - Mud
  - Plant resin
  - Stones mixed with resin
  - Plant fibers
  - Animal fur

A female miner bee at the entrance to her nest turret.
Photo by Scott Bauer, USDA Agricultural Research Service, Bugwood.org

Let's Meet Some Locals...

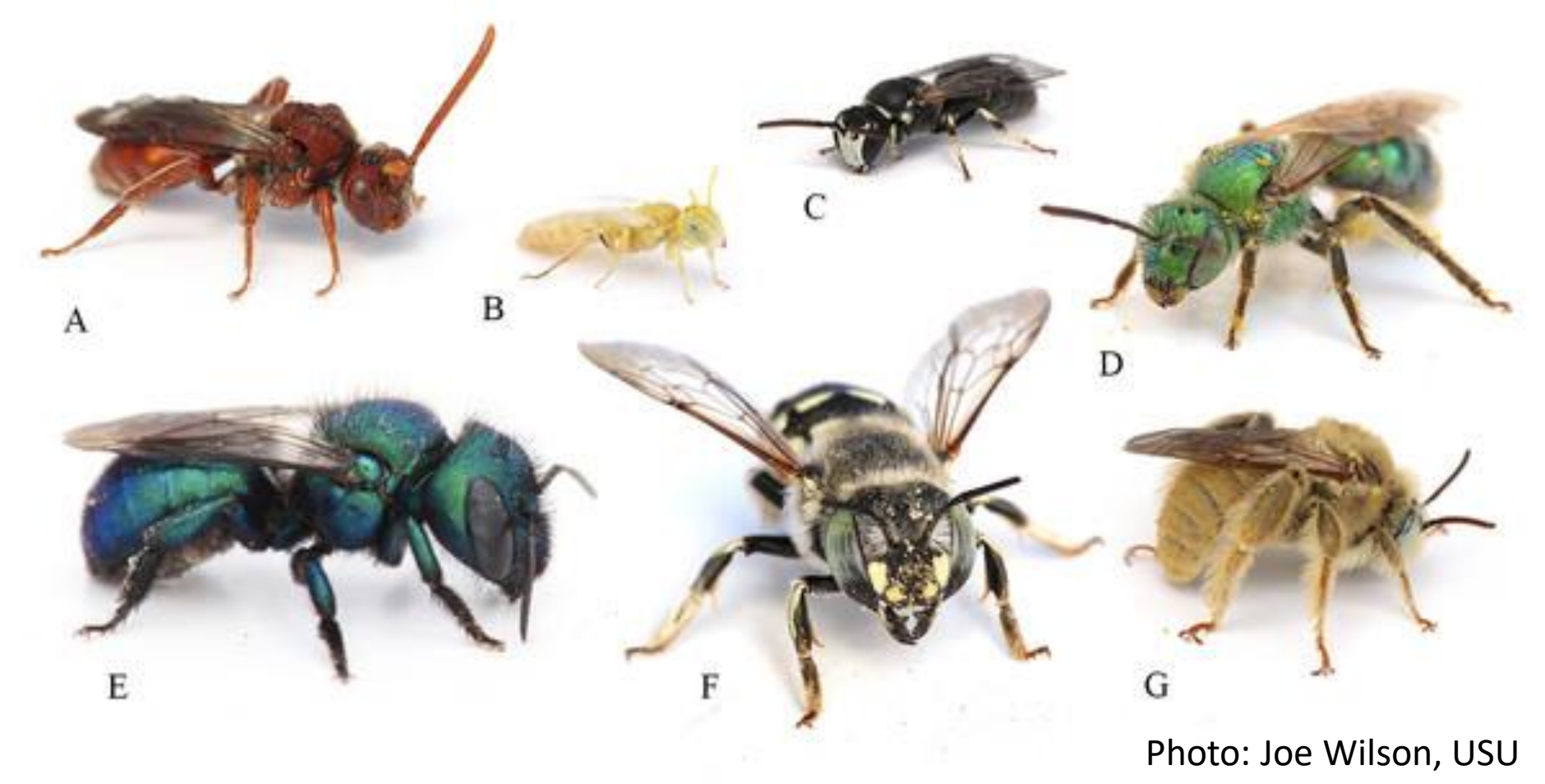


Photo: Joe Wilson, USU


Cavity Nesting Bees

Solitary Cavity Nesting Bees

- Bees nest in cavities that they either construct or find
- Single female per nest

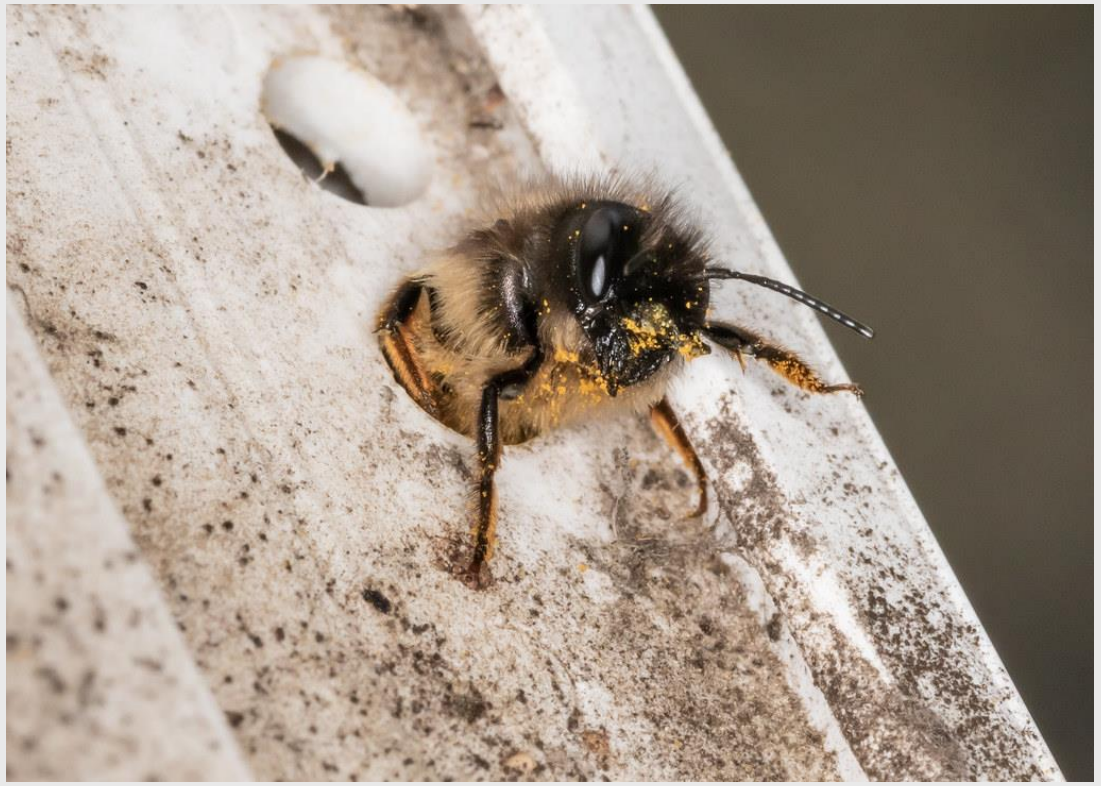
Leafcutter Bees

- Use leaves to construct nests in cavities
- Nest has multiple cells, each cell has a single larva and pollen for food
- Important pollinators – used commercially

Photo: L.J. Buss, U of Florida

Mason Bees

- Blue orchard bee is a common type of mason bee
- Used commercially for pollination
  - More effective than honey bees
- Nest in cavities
- Easy to raise (beebuilt.com has some GREAT resources)
  - Use replaceable tubes
  - Need heavy clay soil
  - Supply forage and nesting material
  - Purchase cocoons online



Wool Carder Bees

- Closely related to leaf cutter and mason bees
- Get their name from their behavior of scraping trichomes or ‘hairs’ from leaves.
  - Lamb’s ear
- Carry trichomes under their bodies to use as nesting material
- Nest in pre-existing cavities
- Males often sleep in flowers and can be very aggressive and territorial

Large Carpenter Bees

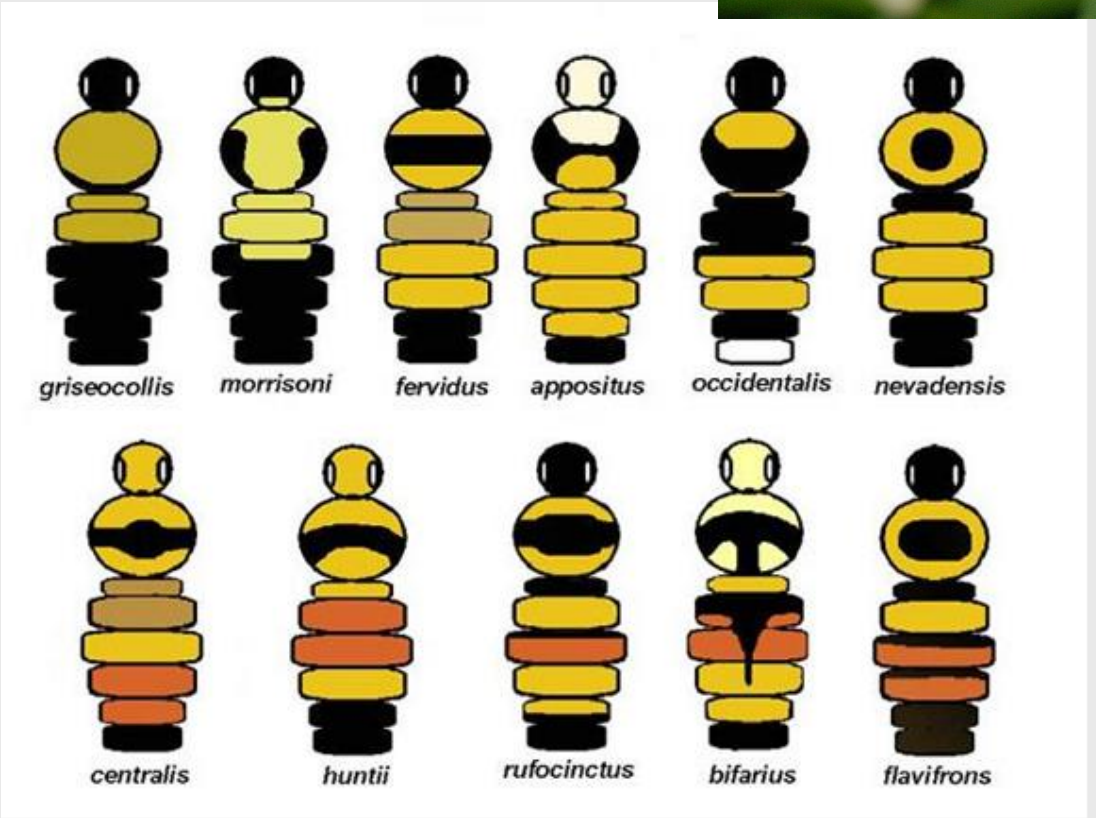
- Most burrow into dead wood or bamboo, a few ground nest
- Can be considered a pest – structural damage
- Extremely large bees, often confused with bumblebees
- Considered solitary, however some have simple social nests consisting of mothers & daughters with some labor division

Small Carpenter Bees

- Small bee (1/4-inch long)
- Construct nests in pithy or semi-hollow stems
- Excellent at pollination
- Cavity nesting carpenter bee (24 seconds)

Bumble Bees

- The only group of social cavity nesting bees in North America
- Nest in abandoned rodent holes or pre-existing holes
- Important pollinators of native plants.
- Often used as pollinators in greenhouses
- Hairy with yellow, black, orange or white bands
- Colonies only last one season
- You can raise them
  - Guide to Bumble Bee Rearing - Oregon State University
  - USDA Bumble bee rearing guide




Ground Nesting Bees

Mining Bees

- Small – ¼ to ½ inch in length
- Hairy face between the eyes and a black brown head
- Nest underground or in thin, patchy lawns
- Prefer dry soil
- Nest entrance is slightly mounded

Photos: Joe Wilson, USU (bee); Whitney Cranshaw, CSU (nest)

Digger Bees

- Burrow into dry soil using their jaws and legs
- Often create a mud chimney around the entrance to the nest
- Large bee roughly ¾-inch, not aggressive, can be mistaken for bumble bees

Photo: U.S. Department of Agriculture

Sweat Bees

- Small to medium sized bees
- Known for the metallic green or black coloration on many species
- Attracted to perspiration
- Nests are often clustered in the ground in dry areas

Long-Horned Bees

- Long antennae
- Important pollinator for squashes, pumpkins, melons, sunflowers and wildflowers
- Can be gray or brown
- Often found hanging out in squash blossoms
- Females dig deep tunnels. Nests may share entrance tunnels.

Photo: Katja Schulz; Flickr

Cuckoo Bees

- Kleptoparasites – the larvae are hatched in other bee's nests and eat the food resources provided by females of other species
- Small (¼ to ½-inch) wasp-like bees that are hairless and lack pollen carrying structures

How Can You Support Native Bees?

- Bee-friendly landscaping practices
- Provide nesting habitat sites
- Plant to provide food resources
- Use IPM practices to reduce pesticide load in the environment

Photo: UC Berkeley Urban Bee Lab
[Mulch Madness]

Landscaping Practices

UTAH PESTS fact sheet
EXTENSION
UtahStateUniversity

Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-175-15 May 2015

Gardening and Landscaping Practices for Nesting Native Bees

James H. Cane, Research Entomologist, USDA ARS

Do You Know?

- About 1,000 species of native bees reside in Utah; few of them are social.
- Some wild bees excel at pollinating Utah's tree fruits, raspberries, squashes, melons and cucumbers.
- Most of these native bees nest solitarily under-

Supplying Resources

- Two sources of food
  - Nectar
  - Pollen
- Nesting material
  - Allow bees to take materials
  - Raise the threshold for damage from leaf cutter bees

The Bee Friendly Rules…

- Bee Sunny
- Bee Diverse
  - Overlapping in sequential bloom periods
- Bee Bountiful
  - Flowers planted in clumps vs. scattered single plants
- Bee Colorful
  - Choose white, blue, pink, and purple to attract bee populations

Bee Friendly Rules…

- Bee Aware
  - Notice what plants are in bloom and which are frequented by bees
- Bee Easy to Access
  - Hybridized plants not always the best
- Bee long-lived
  - Plant for the WHOLE season
  - Biggest nectar flow in Utah is in May/June

Bee Friendly Rules…

- Bee Local
  - Native species often provide the most bang for the buck
  - Plants co-evolved with insects
  - Adapted to growing season, climate, soils, etc.

Bee Mindful of Pesticides

- Reduce use by:
  - Avoid spraying during bloom
  - Avoid broad-spectrum pesticides
  - Use integrated pest management practices
  - Pollinators are most active in the morning

Planting for Pollinators

UTAH PESTS fact sheet
UtahState University COOPERATIVE EXTENSION
Published by Utah State University Extension and Utah Plant Pest Diagnostic Laboratory ENT-133-09 January 2013

Gardening for Native Bees in Utah and Beyond

James H. Cane
Research Entomologist, USDA ARS
Pollinating Insect-Biology, Management, Systematics Research

Linda Kervin
Logan, UT

Do You Know?

- 900 species of native bees reside in Utah.
- Some wild bees are superb pollinators of Utah's tree fruits, raspberries, squashes, melons and cucumbers.
- Few of our native bees have much venom or any inclination to sting.
- Our native bees use hundreds of varieties of garden flowers, many of them water-wise.
- A garden plant need not be native to attract and feed native bees.

Fig. 1. Carder bee *(Anthidium)* foraging at lavender *(Lavendula*: Lamiaceae).[1]

Utah is home to more than 20 percent of the 4,000+ named species of wild bees that are native to North America. Except for bumblebees and some sweat

The following table is sorted in order of bloom, from earliest to latest.
yellow circles indicate week(s) of bloom
red circles indicate peak bloom, a subjective judgement
blue plant names are great choices for Utah gardeners
red plant names are widely used for phenological (seasonal) markers (see National Phenological Network)
Sometimes multiple species of a genus are represented (e.g. several ornamental and edible onions, genus *Allium*).
Utilization by species of several common, recognizable bee genera is indicated by a green check mark in the columns at the left.

Bee genus / FLOWER SPECIES	Apis	Bombus	Halictus	Osmia	Ceratina	Habropoda	Megachile	March				April					May				June				July				August				September					
								4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30
Galanthus	✓							○	○	○																												
Crocus	✓		✓						○	○	○	○																										
Iris reticulata	✓		✓						○	○																												
Forsythia										○	●	○	○	○																								
Salix (pussywillow)	✓	✓		✓						○	●																											
Arctostaphylos		✓								○	○																											
Prunus (apricot)	✓	✓	✓	✓							○	●	○																									
Scilla				✓	✓						○	●	○																									
Viola											○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○											
Muscari	✓	✓			✓	✓							○	●	○	○	○																				
Chaenomeles	✓	✓		✓									○	●	○																						
Prunus (plum)	✓	✓	✓	✓		✓							○	●	○																						
Mahonia	✓	✓		✓		✓								○	●	●	○																				
Cercis	✓	✓		✓		✓								○	●	○	○																				
Malus (apple)	✓	✓		✓		✓								○	●	○																					
Malus (crab)	✓	✓		✓		✓								○	●	○																					
Prunus (cherry)	✓	✓		✓	✓	✓								○	●	○																					
Ribes aureum	✓	✓		✓										○	●	○																					
Pyrus (pear)	✓			✓										○	●																						
Wisteria	✓	✓												○	○	●	●	○																			
Viburnum														○	○	●	○																				
Vinca	✓													○	○	○	○	○	○	○																	
Acer	✓			✓										○	○																						
Syringa (lilac)															○	●	○	○																			
Berberis	✓	✓		✓		✓									○	●	○																				
Caragena		✓		✓											○	●	○																				

Creating a Bee Lawn

Dutch White Clover

Creeping Thyme

While **non-native flowers** may be aggressive, they can still be very useful.

Dutch white clover *(Trifolium repens)* and creeping thyme *(Thymus serpyllum)* are two species that benefit pollinators and will flower in a mowed lawn.

White clover provides additional nitrogen and tolerates drought, making it easy to grow in low maintenance conditions.

Dandelions and Creeping Charlie also benefit pollinators but are very aggressive and typically are not favored by homeowners.

Planting a bee lawn is best in late fall as a dormant seeding, ideally when soil temperatures dip below 40°F.

Germination will not occur until the following spring when soil temperatures rise above 50°F.

Dormant seeding reduces pressure from surrounding weeds that may be competing for resources.

Environment and Natural Resources Trust Fund

Funding for this project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR).

MANAGING BEE LAWNS

Mowing: The one-third rule is a good guide: do not mow more than one-third of the vegetation at one time to a height between 3.5 and 4 inches to ensure that flowering plants survive and produce flowers to sustain pollinators.

Watering: Soil moisture should be monitored. White clover and fine fescue grasses are quite drought-tolerant but may need supplemental watering after several weeks with no rain.

Fertilizing: A soil test (visit soiltest.cfans.umn.edu) will determine if nutrients need to be added. Fertilizer requirements will be minimal if clippings are returned, mowing heights are kept high, and soil quality is good.

Weeding: Hand weeding is the preferred option, with spot treatments with selective herbicide as needed. Learn which weeds have value to pollinators, are diverse and add to a long flowering season for bees and other pollinators.

Visit Bee Lawn Demo/Trial Plots at the Minnesota Landscape Arboretum, located near the shrub garden collection along Three-Mile Drive.

FOR MORE INFORMATION

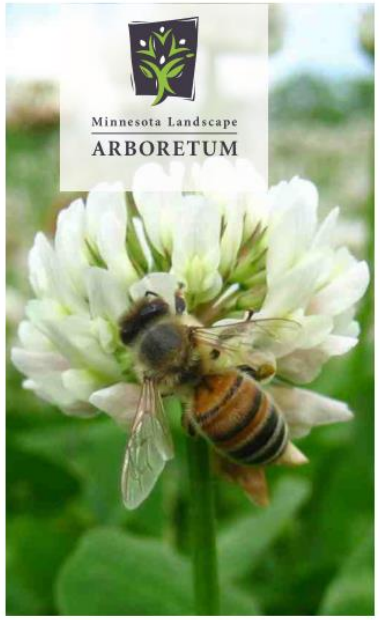
University of Minnesota Landscape Arboretum
arboretum.umn.edu/gardensandcollection.aspx

University of Minnesota Bee Lab
beelab.umn.edu/bees

University of Minnesota Turfgrass Science
turf.umn.edu

University of Minnesota Extension
extension.umn.edu

Mary Meyer, Marla Spivak, Eric Watkins and James Wolfin



Bee Lawns
Turf Grass with Flowering Plants

University of Minnesota Extension

BENEFIT OF BEE LAWNS

Traditional lawns are ornamental or recreational plantings of turf grass that are mowed and managed.

A bee lawn features flowering plants as well as turf grasses, with these benefits to bees and pollinators:

- Natural diversity of forage for pollinators
- Less mowing, fertilizing and watering
- Beauty of flowers
- Increased resilience to extreme seasonal temperatures and drought

ENHANCE YOUR LAWN TO PROMOTE POLLINATORS

A new bee lawn can be established from a seed mixture of grass and flowers or by seeding flowers into an existing lawn. Seeding into an existing lawn is less expensive but can be challenging to establish, as new flowers compete for space with grass. Good seed germination requires adequate moisture, good soil to seed contact and erosion protection. For best results, try scalping (mowing grass to 1 inch or less), aerating and then adding flower seed. Find information at: beelab.umn.edu/bees

GRASSES TO USE

Native Fine Fescues grow slowly and do not compete against bee-friendly plants. Fescues are main components of shady lawn mixtures but grow well in full sun. They tolerate drought and low soil fertility, making them good choices for flowering lawns.

Kentucky Bluegrass* establishes slowly, allowing non-native flowering plants to grow along with the lawn. It requires more intense management than fine fescue grasses.

* The use of non-native species in a bee lawn does not meet Board of Water and Soil Resources native vegetation establishment and enhancement guidelines, and does not meet the project requirements of the ENRTF appropriation.

NATIVE FLOWERS FOR BEE LAWNS

Results of research trials at the University of Minnesota show that the best native plants for lawns germinate quickly and adapt to the soil. Native species demonstrating potential include:

Ground Plum
(Astragalus crassicarpus)
A low-growing species in the pea family that is native and common to the prairies of Minnesota.

Lanceleaf Tickweed
(Coreopsis lanceolata)
A late spring bloomer in the aster family.

Lanceleaf Self-heal
(Prunella vulgaris ssp. *lanceolata)*
In the mint family, it is distributed widely in the United States and Europe. There are three self-heal subspecies: ssp. *vulgaris* is native to Europe and throughout North America, and var. *lanceolata* is native to Minnesota.

Calico American Aster
(Symphyotrichum lateriflorum)
A late blooming flower, typically grows around 3 feet tall. When mowed, calico aster will form small dense rosettes, blooming below a 3.5 inch cutting height.