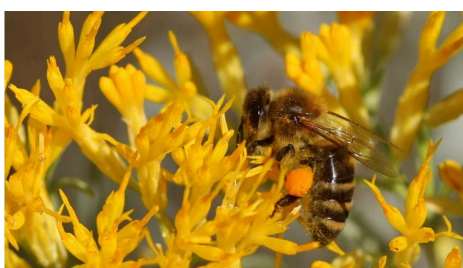


Creating Sustainable School and Home Gardens: Misconceptions About Bees

Kaitlin U. Campbell, Kathy Cabe Trundle, and Rita Hagevik

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Bees are fascinating creatures that play a crucial role in pollination and ecosystem health. However, misconceptions about bees are widespread.

Understanding the facts about bees helps us appreciate their significance and take appropriate action to protect them. Here are common myths and the truths behind the misconceptions about bees.

1. All bees make honey.



Figure 1. Honey

Bees Are the Only Bees That Produce Lots of Honey Not all bees are honey producers. Out of the approximately 3,600 bee species in the U.S., only the honey bee (*Apis mellifera*) makes honey (U.S. Geological Survey [USGS], 2025). Honey bees store honey (Figure 1) to survive harsh conditions, allowing their colonies to live for years. Most bees, such as solitary bees, do not create honey, though bumble bees can make small amounts.

2. Bees are aggressive.

Almost all bees can sting to protect themselves in life threatening situations or when provoked, but they are generally nonaggressive and tend to avoid conflict. Honey bees are more aggressive than most bee species because they have populous hives with lots of resources, like honey and developing larvae (i.e., baby bees), to protect. But even so, they tend to avoid conflict whenever possible.



Figure 2. Female

Bees Have Stingers, Which Are Kept Inside Their Abdomens When Alive

Photo credit: Joseph Wilson, Utah State University

3. Bees always sting.

Bees sting only when threatened. The stinger is a structure derived from the ovipositor (used for egg-laying) in female bees; therefore, the male bees cannot sting at all! (see Figure 2.) Additionally, stingless bees (*Meliponini*) are a type of tropical bee which no longer has a functional sting and will bite instead (Roubik, 2023).

4. Bees die after stinging.

This is true only for honey bee workers, whose barbed stingers get stuck in the skin of mammals. Queen bees, and all other bees, can sting multiple times without dying.



Figure 3. (A) Squash Bee Pollinating a Luffa Gourd Flower; (B) Bumble Bee Using Buzz Pollination on an Eggplant Flower; (C) Southern Blueberry Bee Resting on a Blueberry Leaf

5. Honey bees are the best pollinators.

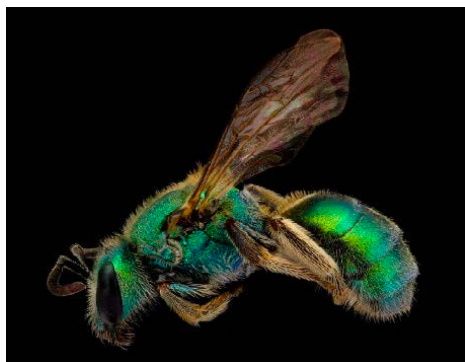


Figure 4. Many

Sweat Bees Are Brilliant Colors of Green and Blue

Photo credit: USGS Bee Lab (public domain)

Honey bees, which are extremely important economically to industrialized food production systems, have large colonies that can be trucked around the country as needed to meet pollination demands. However, they are not the best pollinators for many crops. For example, squashbees (e.g., *Peponapis* and *Eucera*) are specifically adapted to pollinate squash, pumpkins, and gourds (Figure 3A) and will even sleep inside the flowers at night. Bumble bees (*Bombus* sp.; Figure 3B) and southern blueberry bees (*Habropoda laboriosa*; Figure 3C) use buzzpollination, which efficiently releases pollen from plants in the nightshade family (tomatoes, eggplants, potatoes) and blueberries.

6. Bees are all black and yellow.

While honey bees are often black and yellow, bees come in a variety of colors, including green, metallic blue, red, and orange (Droege, n.d.; Figure 4).

7. Bees live in hives.

Only honey bees live in hives (Figure 5). Most of the native bees in the U.S. nest in the soil, though some species like mason bees, leaf cutter bees, and carpenter bees use twigs or wood for their nests.



Figure 5. Honey Bees

Are Typically Kept in Langstroth-Style Hives (left), Though Some Beekeepers Use Top Bar Hives (two hives on



the right)

Figure

6. Undergraduate Student Observing and Taking Measurements for a Study on Bee Hotels

8. Bee hotels are harmful.

Properly designed bee hotels (i.e., native bee homes) can provide safe nesting spaces for many solitary bees (e.g., mason bees, leaf cutter bees, and resin bees), aiding conservation efforts. Bee hotels can become detrimental through the buildup of parasites and pathogens when they are not well cared for. Nesting material should be replaced frequently, and homes should be monitored for parasites (Youngsteadt & Favre, 2022; Mull et al., 2022; Figure 6).

9. Bees are only interested in flowers.

Although bees are vital pollinators, gathering pollen and nectar, they also seek water and resin, which they use to cool the hive and seal up the hive, respectively.

10. Wasps are just angry bees.



Figure 7. Wasps,

Like Yellowjackets, Are Frequently Confused With Bees, and Give Bees a Bad Reputation

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Bees and wasps are distinct groups of organisms. Wasps are predatory, and social species such as paper wasps, yellow jackets and hornets, may be particularly aggressive, often giving bees a bad reputation. Wasps are important predators in the ecosystem, helping to control pests. Bees

are typically focused on pollination and nectar collection and will not act aggressively unless they are harmed. Wasps are typically more slender and less fuzzy than bees (Pollinator Partnership, n.d.; Figure 7).

11. Honey bees are endangered. We should start hives to “save the bees.”

Honey bees (*Apis mellifera*) are not endangered. In the U.S., honey bees are an introduced, non-native species with over 2.7 million hives (U.S. Department of Agriculture, 2024; Figure 8). While honey bees undergo substantial losses due to parasites, pathogens, and other stressors, keeping honey bees is not recommended as a means to help pollinators. Remember, honey bees in the U.S. are only one species of bee! Instead, consider improving pollinator habitats to support native bees like threatened bumble bee species (Hatfield & Shepherd, 2025; Xerces Society for Invertebrate Conservation, n.d.). You can improve pollinator habitat by planting native wildflowers that bloom in the spring, summer, and fall.



Figure 8. Honey

Bees Are an Introduced Species in the United States

12. Everyone would die if bees went extinct.

Bees are very important to agriculture, particularly for fruit production. The quote “If the bee disappeared off the surface of the globe, then man would only have four years of life left” is often attributed to Albert Einstein. However, there is no evidence to support the attribution or statement (Quote Investigator, 2013). Many parties have attempted to gauge the extent to which our crops are dependent on pollinators, and the studies have demonstrated that there would be a yield loss, but not a complete collapse (Aizen et al., 2009; Aizen et. al., 2019; Ritchie et al., 2021). Those in agriculture will need to prioritize management practices that preserve pollinator biodiversity to promote high yields in the face of declining pollinator populations (Aizen et. al., 2019; Ritchie et al., 2021).

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Authors

Kaitlin U. Campbell, Kathy Cabe Trundle, and Rita Hagevik