What's the Buzz on Bees?

By Sam Graham, Fairfax Master Gardener Intern

Honey bees are usually the first thing that comes to mind when bees are mentioned, but they are just one of over 20,000 species of bees. Selected and domesticated in the old world for their characteristic of storing nectar in excess of hive requirements, keeping bees went hand-in-hand with human settlement. Honey bees, which are not native to the Americas, were brought to Virginia by the earliest colonists in 1622. At that time bees were kept in the iconic upside-down baskets called skeps. When the colony grew large enough to divide into other skeps, the honey would be harvested by breaking apart the hive, totally destroying the original colony in the process. This wastefully simple process was the beekeeping method until the wooden box hives replaced it 150 years ago.

Skeps

photo: Christine Casey, University of California, Davis

Langstroth hive

The observations of a beekeeper named Lorenzo Langstroth in the mid 1800s brought about the birth of beekeeping as we know it today. Langstroth discovered that bees maintain strict gaps between honey comb in their hives, aptly named bee space. Gaps less than 3/4 inch are blocked with a gluey substance called propyls, and gaps greater than 1/2 inch are obstructed by burr comb. This discovery allowed beekeepers to manipulate artificial honey comb frames spaced 3/8 inch apart that bees could build upon, but wouldn't glue together, and thus the advent of the familiar box-like Langstroth hives that are ubiquitous today.

Langstroth's hives brought about a vast increase in beekeeping. As beekeeping in the 1800s increased, a deadly tracheal parasite began to impact beekeeping. The German Black Bees (*Apis mellifera mellifera)* kept at that time were highly vulnerable to these mites. For this reason, beekeepers in America began using the more resistant yellow Italian bees *(Apis mellifera ligustica).* This change was comprehensive, and German bees became all but extinct in the Americas over the next few decades.

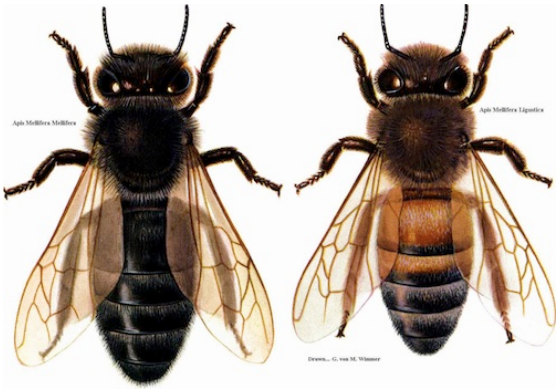

photo: G. von M. Wimmer

German Black Bee (left) Italian Bee (right)

As the well-worn practices of family farming transitioned to the modern era of agriculture in the 1900s, pollination was outsourced, and the number of hives shrank as pollination services could now be trucked across state lines to align with crop maturity dates. All of this came at a cost. Beekeeping in Virginia decreased from approximately 100,000 hives in the early 1900s to around 8,500 hives in 2017. Interstate pollination helped spread invasive diseases that had previously been localized. Systemic pesticides drastically impacted colony health. Invasive mites and weather challenges wiped out the hives already weakened

by these other factors.

As Master Gardeners, we want to play our part to protect this vital insect. The first step is to reduce or stop using pesticides. Growing a wide variety of flowering plants can contribute to optimal bee health. By having a selection of continuously flowering plants, gardeners can ensure forage for bees throughout the growing season. While flower gardens are nice, the reality is that bees collect nectar from 2 million flowers and fly 55,000 miles to produce a pound of honey. A healthy hive must create 60 pounds of honey to survive winter in Northern Virginia, which means it takes a lot of windowsill flower gardens to keep bees fed. Trees are an alternative to flower gardens, and a major source of nutrition for pollinators. Trees that provide continuous benefit when planted together are Black Locust *(Robinia pseudoacacia),* American Plum *(Prunus americana),* Black Cherry *(Prunus serotina),* Persimmon *(Diospyros virginiana)* and Yellow Poplar *(Liriodendron tulipifera).* This five-tree combination provides major nectar and pollen sources for bees throughout the foraging season. Other great trees for pollinators include Black Tupelo *(Nyssa sylvatica),* Sourwood *(Oxydendrum arboretum),* and even Maple (Acer) when spring is unseasonably warm as it has been in recent years. For more diminutive flowering options, consider seeding lawns with microclover, planting hedges out of Blueberry *(Vaccinium spp.),* Inkberry (*Ilex glabra),* Japanese holly *(Ilex crenata),* and Schip Laurel (*Prunus laurocerasus* "Schipkaensis"), and providing a bubbling fountain as a water source.

For the aspiring beekeeper who is willing to put in the extra work to keep bees, start planning for spring beekeeping in the fall. Colonies to be started in March or April should be ordered in the fall, and a beekeeping class is strongly recommended. Years ago, an eager new beekeeper could procrastinate until March. These days, due to colony losses approaching 50 percent each year, new packages of bees must be ordered in the fall to ensure they are able to take advantage of the spring nectar flow.

Mason bee home

photo: Sam Graham

A fun side-note on honey. Contrary to rumors, honey crystallization is not a test of authentic honey. Crystallization depends primarily on the nectar source for the honey. Over time, almost all honey will crystallize, but while some sources such as clover crystallize very rapidly, other sources (many of the tree honeys) take years to crystallize. Crystallized honey can be reheated if desired. Honey is the only food that doesn't spoil.

Although honey bees are critically important to agriculture, native bees are in greater danger of extinction. Vulnerable to many of the same issues as honey bees, native pollinators are not often raised by people. Social bees, such as Bumblebees, and solitary bees, such as Carpenter bees and Mason bees, are often better pollinators than honey bees. Honey bees pollinate by traveling back and forth to the colony to deposit nectar and be cleaned. Bumblebees and solitary bees, on the other hand, travel from flower to flower continuously, and have longer tongues than honey bees, allowing them to access the flowers that honey bees can't pollinate.

Mason bee homes

photo: Sam Graham

Mason bees can be assisted by creating a simple habitat out of scrap wood. Using unpressured-treated 4x4 posts cut in 8-inch lengths, drill several 5/16-inch holes 5 inches deep. In early March, mount the posts around your garden, facing east, with a very slight downward angle so

rain doesn gather in the holes. The Mason bees will nest in these holes, drastically improving the pollination of your garden in the process (especially fruit trees). Mason bees rarely ever sting. You will know when they set up shop when you see bits of dirt in the holes that they use to seal up the entrance.

All bees are critically in danger in our modern industrialized society. With the perils bees face, making a difference can be done in many simple ways. Regardless of whether you plan to start beekeeping, want to provide a habitat for native bees or want to plant year-long forage, as the old proverb goes, The best time to start was 20 years ago; the second-best time to start is now.

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