What You Can Do

Unfortunately many species of bees and wasps are declining in population. The over-use and improper use of insecticides and pesticides harms a wide variety of bees and wasps. Hedgerows and fields of wild flowers are disappearing. Modern urban landscaping favors lawns and shrubs, and not flowers and plants that provide pollen and nectar resources for the bees and wasps. People are just now beginning to understand how important it is to protect and provide for our populations of bees and wasps. You can help in this effort by reducing the amount of insecticides and pesticides used in your yard and encouraging your neighbors to do the same. You can plant a wide variety of flowers and plants that bloom throughout the spring and summer to provide pollen and nectar resources for the bees and wasps. A list of helpful websites and publications can be found below.

Helpful Resources

YouTube
- NATURE documentary: Silence of the Bees
- BBC documentary: Who Killed the Honey Bee
- PBS NOVA documentary: Tales from the Hive
- TED TALK: The Hidden Beauty of Pollination
- TED TALK: Marla Spivak Why Bees Are Disappearing
- Oregon Field Guide Mason Bee segment

Movies
- More Than Honey
- Vanishing of the Bees

Books
- Sare.org: How to Manage the Blue Orchard Bee
- Sare.org: Managing Alternative Pollinators
- The Bees in Your Backyard by Joseph S. Wilson & Olivia Messinger Carrill.
- Archive.org/details/trapnestingwasps00krom: Trap-nesting Wasps and Bees by Karl Krombei

Booklets
- Oregon.gov: Search Native Bee Guide Identification Guide

Websites
- Xerces.org
- FWS.gov/pollinators/pollinatorpages/yourhelp.html
- Hutchingsbeeservice.com
- Crownbees.com

Brochure Information

All photos taken and brochure information compiled by Ron Spendal, OSU Master Gardener.

Tualatin Soil and Water Conservation District
Conservation is for everyone.

Oregon State University Extension Service Master Gardener
Washington County

Hillsboro Parks & Recreation
Jackson Bottom Wetlands Preserve

Bees & Wasps

Female Mason Bee on Oregon Grape

Characteristics

Bees evolved from wasps approximately 125 million years ago. Like wasps, bees have four wings and six legs. Only female bees and wasps have stingers. Male bees and wasps have no stingers and their only role is usually to mate with the females.

There are over 20,000 species of bees in the world and more are being discovered every year. There are over 4,000 species of bees native to North America. Ninety percent of these bee species are solitary, meaning that each female builds and provisions her own nest and lays her own eggs. They do not live together in hives.

Approximately 500 species of bees live in Oregon. It is likely that more than 500 species of wasps live in Oregon, but there has never been an attempt to document this. Several species of bees and wasps live in Washington County.

Bees come in a wide variety of sizes and colors.

Some flies have evolved to look like bees and wasps. There are three easy ways to identify differences however. Flies only have two wings. Bees and wasps have four wings. The antennae of a fly are very short and close together. Bee and wasp antennae are longer and widely spaced. Flies have much larger eyes than a bee or wasp and their eyes are closer together.

Bees eat pollen for protein and drink nectar for carbohydrates. Wasps eat other insects or meat for protein and drink nectar for carbohydrates. Nectar is a carbohydrate drink that gives bees and wasps a lot of energy.

Bees have fluffy hairs which look more like a feather than a human hair. Pollen is easily transferred from a flower to the bee because of these hairs. Most bees build up a positive electrical charge as they fly. This charge helps pollen cling to the bee. Some bees, like honey bees and bumble bees, have special places on their hind legs to pack the pollen after it has been moistened with nectar. Some bees pack dry pollen onto stiff hairs on the underside of their abdomens.

Bees and wasps go through a complete metamorphosis. They progress from an egg to a larva to a pupa and finally to an adult. Most female bees and wasps have the ability to determine the sex of their eggs. If they fertilize the egg it will become a female. If they don't fertilize the egg it will become a male.

The number of species of honey bees and bumble bees make up less than one percent of all bee species.

There are over 18,000 species of wasps in North America and 4,000 species of bees.

Over 70 percent of flowering plants are pollinated by insects, primarily bees. Bee pollination is responsible for over 33 percent of the food produced in the U.S.

Honey Bee on Yarrow

Honey Bees

The bee that everyone is able to easily identify is the honey bee, Apis, although the honey bee is not native to the United States. It came from England with the colonists around 1624. Most bees are very different from honey bees. Honey bees live in hives above the ground, but most bees (70 percent) live in the ground. Honey bees are very social and work together to build and maintain their nest but 90% of bees are solitary bees and work alone. Honey bee mothers (the queens) meet their offspring but the vast majority of bee mothers never see their young. Honey bees make and store honey to feed on in the winter. Very few other bees store food for the winter.

Defense Instincts

The bees and wasps that are highly social and live in hives tend to have very active defense instincts. If they perceive something to be a danger to their hive they will attack. Solitary bees and wasps usually have very low defense instincts and generally do not sting unless significantly disturbed. Honey bee stingers are barbed and stick in the object being stung. Once a female honey bee stings, the stinger is ripped from her body and she dies. Other bees and wasps have needle like stingers and can sting several times if necessary. Solitary bees have a low defense instinct and a high survival instinct.

Nesting Areas

Seventy percent of bees nest in the ground. Those that live above ground most often choose pre-existing holes to nest in like hollowed out twigs, abandoned beetle burrows or crevices in rocks or trees. A few species build nests on the outside of structures using mud or resins that they collect. Some species of bees and wasps will readily nest in man-made nesting devices.

Throughout the spring and summer many native bees and wasps are present in Washington County. Many of these bees and wasps will readily nest in man-made devices if the nesting devices have nesting channels that are of the diameter preferred by the different species of bees and wasps.

Nesting stations in the Pollinator Garden at Jackson Bottom Wetlands Preserve.

Mason Bees

Mason bees, Osmia lignaria, are one of the earliest bees to appear in the Pacific Northwest. They emerge from their cocoons in mid to late March. Mason bees build their nesting cells using mud. They prefer to nest in crevices and holes that are five-sixteenths inch in diameter. They will easily nest in man-made devices like straws or wooden nesting trays. Mason bees build their nests in March, April and May. By early to mid-June all of the mason bee eggs have hatched, become larvae, eaten their nesting cell provisions and have spun cocoons around themselves. In the following Spring the new generation of mason bees will emerge from their cocoons and a new life cycle begins. Mason bees are excellent pollinators. Mason bee nesting stations are located at Jackson Bottom Wetlands, Jenkins Estate and Portland Community College Rock Creek campus.

Wasps

The wasp, Isodontia elegans, (the grass carrying wasp) nests in abundance in Washington County. They appear around the first of July. These wasps will readily nest in the same nesting stations used by the mason bees. They also prefer nesting channels that are five-sixteenths inch in diameter. These wasps build their nesting cells using dried grass clippings. They provision their nests with snowy tree crickets, four spotted tree crickets and drumming katydids. By mid to late September the Isodontia elegans eggs have all hatched and become larvae and the larvae have eaten all their provisions and have spun cocoons around themselves. In the following July the wasps will emerge from their cocoons and a new life cycle begins. The nesting behaviors of these wasps are being studied locally and the cocoons are being shared with Montana State University in a joint research project.

Isodontia Elegans (The Grass Carrying Wasp) on Nesting Tray