Bee Aware, Part 1

July 6, 2012
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A world without pollinators would leave us without food

What is pollination? Who are pollinators? Native vs exotic?

Skagit County's agricultural bounty depends on the labor of bees: the bounty of berries, apples, tomatoes and even plants grown solely for seeds. Vegetable seeds are a major Skagit Valley crop. These seeds must be pollinated, and many seed farmers rent hives of honeybees to pollinate their cabbages and Brussel sprouts. Skagit farmers grow 75% of the US supply of cabbage seeds – without these bees, coleslaw and other tasty, healthy salads would be in very short supply.

Where would we be without bees and other insect pollinators? Our diet would be bereft of blueberries, carrots, almonds, oranges, broccoli, even coffee and chocolate! All these foods come from plants which must have insect pollinators. Nearly 75% of flowering plants on the earth need some assistance from pollinators in order to set seed or fruit. These plants provide at least 1/3 of our food, and other species' diets rely even more on plants requiring pollination.

Bees and other pollinators are the “matchmakers” for many flowering plants. Think of your garden: Firmly rooted in the soil, tomatoes or blueberries can't go on dates seeking mates. As they collect nectar and pollen from flowers, these insects transfer grains of pollen from one blossom to another, fertilizing the plants' seeds. The resulting fruits, vegetables and nuts make up an important part of our daily meals.

Some plants are fertilized by wind-delivered pollen. Others require the assistance of native bees, wasps, butterflies, moths, ants, beetles and even some bats. But the primary pollinators of North American food crops are the descendants of honeybees imported by early European settlers. According to the Xerces Society, a group of researchers working to protect North America's native bees and butterflies, these European honeybees now work in place of native pollinators because they can be supplied in large, easily-transported hives. In their book *Attracting Native Pollinators*, Xerces Society researchers note that Maine's 60,000 acres of low bush blueberries are pollinated by honeybees from approximately 60,000 hives. These bees are trucked in from farms in Florida or the Carolinas. “They are there...because modern industrial-scale agriculture has reduced the area of habitat available to support the more than 270 bee species that are native to the state.”

The Native Advantage

Many native bees are far more effective pollinators than the exotic, or non-native, European honeybee (*Apis melifera*). Xerces Society researchers found that many native bee species forage earlier and later in the day than the exotics, putting in more work than their European counterparts. Native bees often pollinate flowers during cold, rainy weather, when honeybees remain huddled in their hives. Many native species have a very short foraging range, so they rarely leave the orchard or field.

Some native species are closely tied to a single plant family for their pollen needs, with young bees emerging from brood cells when "their" plants are flowering. The southeastern blueberry bee (*Habropoda laboriosa*) digs a nest deep underground, sometimes 18 inches below the surface. At that depth, soil temperature and moisture are generally quite stable, protected from seasonal changes. Yet somehow the new generation of young bees emerges when the blueberry plants begin to flower.

Left: Providing a dry location for a nesting box near your home orchard will encourage your mason bees to thrive and multiply. **Middle:** Our native bumblebees visit many of the flowers and herbs in the garden, especially lavender. **Right:** A honeybee pollinates a cabbage plant grown for its seed. Since Skagit farmers grow 75 percent of this country's cabbage seeds, they often rent hives of honeybees to ensure the best crop production. **Photos by Christine Farrow / Skagit County Master Gardeners**

Beyond the Hive

The southeastern blueberry bee is one of many species that do not live in hives – in fact, over 90% of North American bees are solitary, rather than social. Honeybees nest together, with the queen protected in the center of the hive, while workers relentlessly gather pollen to feed the queen. In solitary species, each female constructs her own nest and gathers food without help from drones and other workers. Some solitary bees make nests by tunneling in the ground, or making holes in dead or dying trees.

In eastern Washington, the native leafcutter bee (*Megachile rotundata*) is a solitary species, nesting in tube-like holes bored into wood. They are essential pollinators of our state's important alfalfa crop – far more effective than the European honeybee, according to Dr. Lloyd Eighme, professor emeritus of entomology. Eighme said, "The growers tried many ways to increase the

population of leafcutter bees, such as drilling holes in fence posts and barns, until a bright (or lazy!) graduate student thought of filling nesting boxes with drinking straws. The increase in production of alfalfa seed per acre was phenomenal, and you can still see nest boxes full of straws in the alfalfa fields at blossom time." Incidentally, these same bees cut round holes in the edges of rose bush leaves. "These cuts make the leaves look a bit ragged, but I hope you will forgive the little leafcutter bees because they are some of our best pollinators," added Eighme.

Many gardeners and orchardists nest boxes, filled with straw, for mason bees (*Osmia spp*). These solitary natives earned their name by nesting in hollow stems or holes bored into wood. They seal these tubes with a cap of mud or leaf cuttings to protect their eggs from predators.

The Humble Bumblebee

In his book, *Insects of Skagit County*, Eighme said, "Of all the insects in Skagit County, one of the most valuable to us is the bumblebee. The bumblebees are our best pollinators." These native bumblebees are found from sea level to high mountain meadows. Eighme's own orchard has enjoyed the benefit of these hard-working insects. "For several years there were no beekeepers within several miles of my place, and I never saw any honeybees. During those years, my fruit trees and berries were pollinated entirely by bumblebees and other native pollinators, and I had excellent crops."

The hard-working bumblebees are ground-nesting insects, making homes in piles of leaves and grass. Eighme says we can help them feel welcome in our gardens. "A few weedy corners with dry grass and debris will provide nesting sites for them. A continual source of nectar will provide food as they need it throughout the season." Bumblebees need a long succession of blooms to forage for nectar and pollen. Flowers such as cosmos bloom into late summer and early autumn. Winter-blooming heathers provide flowers when many other plants are dormant.

According to Xerces Society researchers, "...pollinators have only a few basic habitat requirements: a flower-rich foraging area, suitable host plants or nests where they can lay their eggs, and an environment free of pesticides." This may seem obvious -- a blooming plant, poisoned with pesticides, will attract pollinators, only to harm or kill them. Welcome these hard-working pollinators into your garden with an appealing succession of pesticide-free blooms, and they'll help you enjoy abundant crops of fruits and vegetables.

Pesticides are only one of several threats facing native bees, European honeybees and other pollinators. Next week we'll learn what researchers are finding about exotic mites and diseases, colony collapse disorder, pesticides banned in European countries, and habitat loss.

Resources:

- "Insects of Skagit County," Dr. Lloyd Eighme, WSU Skagit County Extension, 2010.
- "Attracting Native Pollinators," Xerces Society, Storey Publishing, 2011
- *"*Attracting Pollinators to Your Garden,*"* U.S. Fish and Wildlife Service (August 2011), at https://www.fws.gov/pollinators/pdfs/pollinatorbookletfinalrevweb.pdf.

Note: a hyperlink in this article has been updated since its initial publication.