



Exploring 4-H at Home

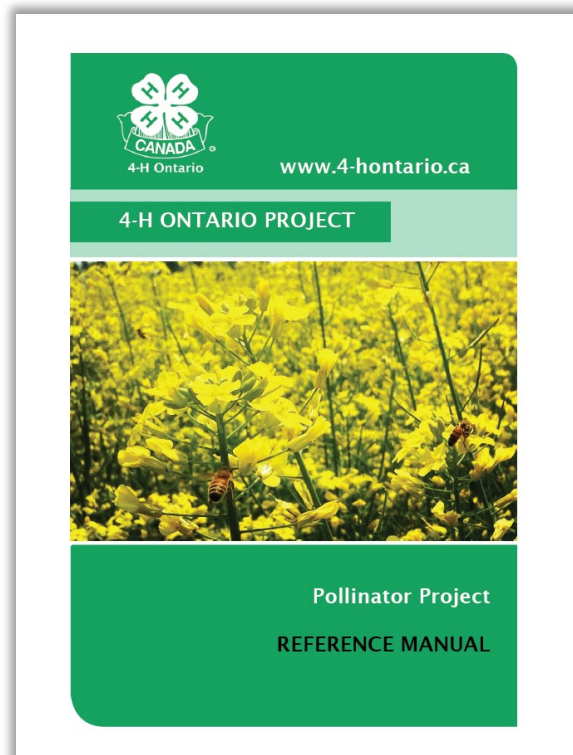


Sustainable Agriculture
and Food Security

Pillar: Sustainable Agriculture and Food Security

Project: 4-U: Bees

Activity: Learning About Pollinators
(From 4-H Ontario's Pollinator Project, available on 4-H LEARNS)



Topic Information

What are pollinators?

Pollinators are animals, mostly insects such as bees. But, birds and bats and a few other animals also help plants produce fruit and seed through the pollination process.

Pollinators are necessary for both plants and animals in agricultural and natural ecosystems.

What is pollination?

Pollination is a crucial event in a plant's life because it is essential for the production of seed and future generations of a species. Before most plants can produce seeds and fruit they must be pollinated. Pollination is the transfer of pollen from the male reproductive parts to the female reproductive parts of a plant. Sometimes there is self-pollination, whereby there are no pollinators involved. This process occurs when pollen, which is produced in the stamen (male part of the plant), is transferred to the pistil (female part of the plant). Once pollination takes place, seeds begin to develop. Pollination is an important part of a plant's life cycle, from flowering plants to non-flowering ones. Without pollination, most plants could not produce fruit or create seeds.

There are two methods of pollination:

- **Cross-pollination** is the most common and occurs when the pollen goes from the stamen of one flower to the pistil of another flower. This happens when either insects, birds, small mammals, wind or water transfer the pollen. An example of cross-pollination includes the lowbush blueberry plant.
- **Self-pollination** takes place when pollen is transferred from the stamen of one flower to the pistil of the same flower or plant. Examples of self-pollination include barley and oats.

Fun Fact

Bees don't intentionally pollinate. As they are seeking nectar or pollen, they inadvertently transfer pollen.

Pollination can occur naturally (open pollination) and most often as the result of insects, birds and small mammals. The sticky pollen from flowering plants clings to their bodies, where it is carried from one plant to another. Bees carry out more pollination than any other insect. Birds are also responsible for pollination, especially hummingbirds. Small mammals, such as bats, are pollinators as well although bats do not do any pollinating in Canada.

Which animals are used to pollinate plants in Ontario?

- Insects
 - Bees
 - Flies
 - Wasps
 - Beetles
 - Ants
 - Butterflies
 - Moths
- Birds
 - Hummingbirds
- Wind
- Water
- Self-pollination

Pollination by Insects and Birds

Various insects and birds are attracted to specific flowers through colour, fragrance and shape. The colour or markings of a particular flower help attract and guide insects to them for pollination. For instance, bees are often times attracted to bright blue and violet colours. Hummingbirds are often seen on red, pink, fuschia or purple flowers. Butterflies like bright colours such as yellow, orange, pink and red as well as fragrant ones.

When pollen is transported by animals, this is called zoophily.

Fun Fact

Although they only have two wings, some species of flies can be mistaken for bees and wasps (which both have four). Two groups of flies called 'hover flies' (or 'flower flies') and 'bee flies' are good examples of bee mimicry, presumably to discourage birds and other predators

Source: Native Pollinators in Canada, Agriculture and Agri-Food Canada, 2014

Pollination by Wind

Wind-blown pollen is normally dry and dust-like.

Many of the world's most important crops are wind-pollinated. In Canada, these include wheat, corn, rye, barley and oats. Many economically important trees are also wind-pollinated. These include pines, spruces, firs and many hardwood trees, including several species cultivated for nut production.

Wind pollination is useful for cross pollination of plants and in the case of some plants, wind pollination is also useful for self-pollination.

When pollen is transported by wind, this is called anemophily.

Source: *Canpolin* www.pollinator.ca

Pollination by Water

Water can sometimes carry pollen from one plant to another. This often takes place with pond plants, such as pondweed.

Self-Pollination

Some plants have the ability to be self-pollinating. Seeds develop if pollen comes into contact with the stigmatic surface on the same plant. Some plants will self-pollinate when pollinators are not available for cross pollination.

Examples of plants that self-pollinate include barley, oats, peas and wheat.

Why is it so important to learn about pollinators?

All animals (including us!) depend on plants or the animals that feed on plants. Without pollinators, a plant community relies on the small number of plants that are self-compatible (pollinate using self-pollination). Relying on self-pollinated plants long term results in a decrease in the variety of plants that grow as well as the opportunity for plants to adapt leading to an overall loss of biodiversity.

In addition to the food we eat, pollinators support healthy ecosystems that clean the air, stabilize soils, protect from severe weather and support other wildlife.

Try one of these activities at home.

1. Take a walk in your backyard or in your neighbourhood (make sure to get your parent's permission first). Count how many pollinators you can find and what they are (e.g. bee, hummingbird, etc.). Record your findings in your Record Book.

AND/OR

2. Why are pollinators important? Write down everything that you have on your plate for supper. Using either the library or the Internet, research which items need a pollinator in order to grow. For meat, research what types of feed the animal eats and whether that feed needed a pollinator in order to grow. Record your findings in your Record Book.