How to Help Bees and other Pollinators

Bee health is a growing public concern and more attention and resources are being put toward finding solutions to mitigate bee losses (from the Canadian Association of Provincial Apiculturists statement on honey bee losses in Canada).

We don't think about tiny bees very often. But bees are making big headlines around the world. The bee and other pollinators are the cornerstone of our ecosystem and are critical to our world's food supply. Scientists from Canada to France and the US to UK and China are working to help understand the causes of decline in bees and pollinators. Few of us are research scientists capable of helping out with studies, but there are some things we can all do to assist honeybee and natural bee populations close to home. Here are some specific areas for you to consider. Even a small effort by many can make a big difference.

1. Plant bee-friendly gardens

Bees are losing habitat all over the world because of pristine green (but flower-barren) sprawling suburban lawns, intensive monoculture-based farming practices, and from the destruction of native landscapes. Just planting flowers in your garden, yard, or in a planter will help provide bees and other native pollinators with forage.

The good news is that bees and other pollinators are easy to please and bee-friendly flowers are easy to grow. Bees consume two food sources: nectar (for sugar as a source of energy) and pollen (for protein). Bees are all about collecting pollen and nectar to feed themselves and their larvae.

Even a small garden or a few potted plants can help, and here are some tips to help.

Provide colourful flowers

When selecting your plants, keep in mind that bees are attracted to white, yellow, blue and purple flowers. Bees see some colours differently than humans and they see black when people and birds see the colour red. Certain red flowers may be attractive to bees if they are fragrant.

Provide blooms all year round

The best bee-friendly gardens have a range of plants that bloom throughout the season. Look for some plants that flower in the spring, summer and late fall. Some bee species emerge early and will be looking for much needed pollen and nectar sources provided by spring bulbs such as narcissus and crocuses, trees like the pussy willow and dandelions. Other bees will continue foraging late into the season too, so try to ensure you include late flowering blooms in your garden.

Plant in Clusters

When you are creating a bee garden, position your plants in clumps or in the same area so they are easier for the pollinators to locate. Bees tend to harvest one type of nectar at a time so putting them together helps the bees conserve their energy.

Plant a variety of flower types

There are about 300 species of bees in Alberta alone (including about 30 bumble bee species) ranging in size from a few millimeters to 2.5 centimeters in length so blossoms should vary in species and size as well. Different bees have different lengths of tongues so a variety of flower shapes and sizes will attract a diversity of bees. For example, Foxglove has a very long flower whereas the nectar in thyme can be accessed by the smallest of bees.

Some plants require sonication, or vibration at a specific frequency, before they release their pollen. These flowers wait until a bee comes along and vibrates at the right frequency and in the right spot. Only then does the plant spew out its pollen. Potatoes, tomatoes, peppers; pumpkins, zucchinis, blueberries and cranberries are vegetables and fruits that benefit from sonic or buzz pollination.

Select native or heirloom varieties

Good bee plants provide excellent sources of nectar and pollen. For this reason, simple, native or old-fashioned varieties are often better for pollinators than highly cultivated ones. Some highly cultivated ornamental plants are not very useful for bees because they contain little nectar or pollen and may be sterile. Avoid horticultural plants that “double”. They normally have extra petals instead of anthers which produce the pollen.

Impatiens, highly cultivated petunias and begonias, and some hydrangea offer little value to bees. Instead, select traditional bedding plants such as bellflowers, alyssum, bluebells, heathers and lavenders.

There is no doubt that native garden plants are very beneficial to the indigenous wildlife; however, there are many introduced plants that are highly beneficial to bees and other pollinators. In general, choose native plants in a variety of shapes and colours to encourage diversity. Remember that native wildflowers will be better adapted to your climate than exotics.

Consider an organic vegetable garden with a native flower border

A bee garden can include a vegetable and herb garden as well. Why not help the bees and produce organic veggies at the same time? Many fruit and vegetable plants attract bees and the bees increase crop yield from cross pollination. Examples of fruits and vegetables that grow well in Calgary are included at the end of this section.

If at all possible, allow a few leafy vegetables in your garden to "bolt," or go to seed. Seeding plants are a great way for bees to gather food before the colder months. For example, when easy to grow radishes become bitter, let them mature to produce plentiful white flowers.Bordering fruit and vegetable gardens with native flowers, will improve pollination of crops and also supports bees when the crops stop blooming. It will also attract and support other pollinators such as wasps and hover flies that control crop pests.

Make space for herbs in your garden

Make space for herbs in your garden. Herbs tend to grow aggressively but don't take up much space so they make great candidates for planting pots. Here are some that grow well in Calgary.

Chives – Bumble bees love chive flowers. Clip some for cooking but let the rest flower.

Borage – Borage flowers have a high nectar replacement rate which means they refill with nectar very quickly and are therefore a great source of food for bees.

Lavender – Different varieties will flower at different times of the year providing pollinators with a constant supply of nectar and pollen.

Sage, thyme and mint – all grow well in Calgary and are great sources of food for the bees and us. There are many varieties of thyme and some varieties of creeping thyme work well in lawns, are edible and smell great when mowed.

Bee balm (wild bergamot). – even if the plant had nothing but its beauty to recommend it, wild bergamot would still be worth growing. Since the herb is a member of the mint family, it has narrow tubular flowers which bloom from July through September.

Plant flowering trees and shrubs

Flowering trees are attractive to bees especially in the spring when a lot of fruit trees are in bloom. Trees such as crabapple, cherry and chokecherry are not only great sources of pollen for bees but fruit production is increased when a bee cross-pollinates the blossoms. Shrubs such as Portulaca, Saskatoons and Highbush Cranberry attract pollinators, grow well in Calgary and flower mid-summer.

Plant everywhere

Consider developing a green roof on your house, garage or even shed. They can be filled with bee-friendly plants from wildflowers and herbs to succulents like sedums.

In a large deck areas or even small balconies, there is an opportunity to fill pots and planters with flowers or herbs. Maybe try a tomato plant that can be moved in and out when the hail or early frosts come to Calgary.

Include your kids

Creating a bee garden is a great way to inspire kids to love bees and nature. If it is a vegetable or herb garden, it's an opportunity to make a connection between the food we eat and the bees and pollinators needed to help produce the food. All gardens may encourage them to take interest in the natural world of flora and fauna and how it all works together.

Here are some plant suggestions (trees, shrubs, wild & domestic flowers, vegetables and herbs) that are well liked by pollinators and tolerate Calgary weather conditions. Some plants also provide good sources of food for other animals as well as us. For example, sunflowers attract bumble bees and are a nice source of food for chickadees in the winter.

Flowers for Bees - Plant for blooms throughout the growing season in Alberta

	LATE SPRING / EARLY SUMMER	EARLY SUMMER / SUMMER	SUMMER / FALL
Trees / Shrubs	Apple, Pear, Cherry, Chokecherry, Crabapple, Lilac, Plum, Willow	Raspberries, Saskatoons, Dogwood Highbush Cranberry	Roses, Portulaca
Flowers	Bugloss	Alyssum	Asters
	Clarkia	Asclepias	Bee Balm (wild bergamot)
	Dianthus	Alpine sweetvetch (Hedysarum)	Blanket flower
		Bachelor's Button	Cleome
	Foxglove	Black-eyed Susan	Coneflowers
	Heather	Calendula	Cornflowers
	Lupine	Coreopsis	Dahlia
	Osteospermum	Cosmos	Globe Thistle
	Poppy	Dahlia	Marigold
	Prairie Crocus	Delphinium	
	Thrift	Echinacea	Prairie Goldenrod
	Viola	Feverfew	Salvia
		Fleabane	Sedum
		Gaillardia	Sunflower
		Honeysuckle	Zinnia
		Hyssop	
		Lavender	
		Milk Vetch	
		Monarda	
		Nasturtium	

	LATE SPRING / EARLY SUMMER	EARLY SUMMER / SUMMER	SUMMER / FALL
		Petunia	
		Smooth Blue Beard Tongue	
		Snapdragon	
		Verbena	
		Yarrow	
Herbs	Chives	Basil	Borage
		Dill	
		Mint	
		Oregano	
		Rosemary	
		Sage	
		Thyme	
Vegetables	Radishes	Beans	
		Cucumber	
		Peppers	
		Squash/Pumpkin	
		Tomato	
		Zucchini	
Lawn	Dandelions	Clovers	Creeping thyme

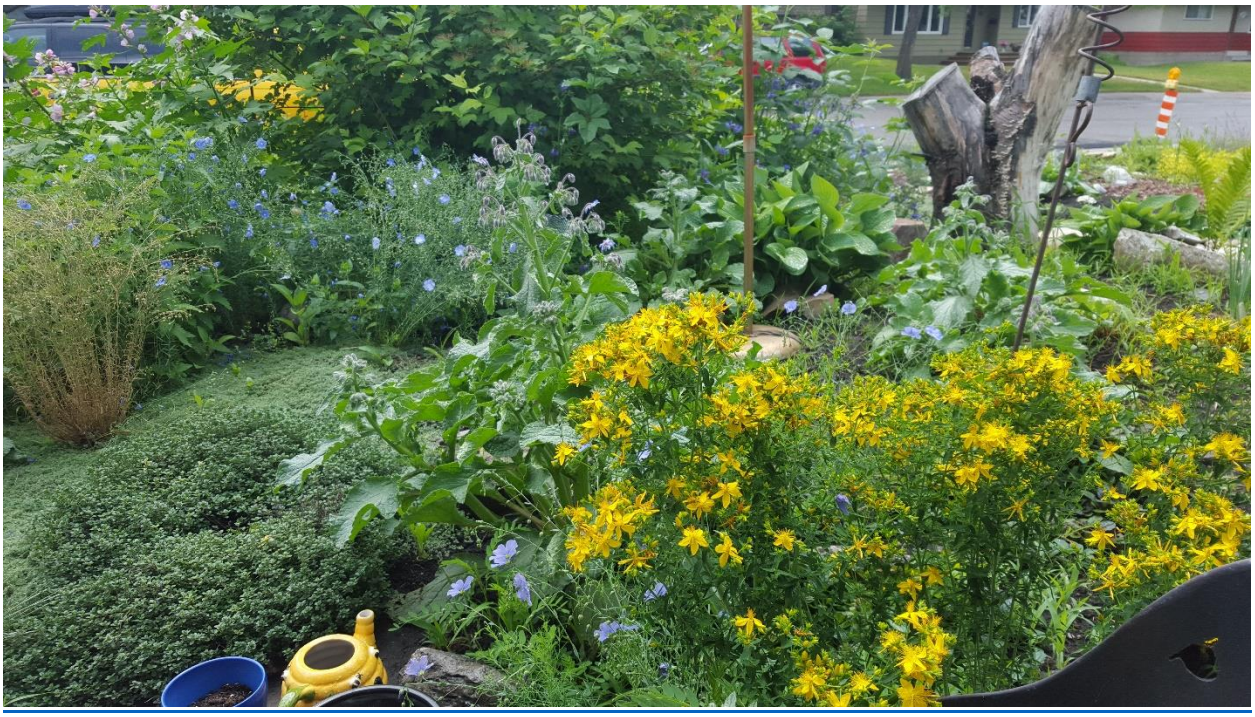

Photo by local native gardener and beekeeper, Laura Trent.

A study of the Relative Ranking of Ornamental Flower Plants for foraging Honeybees was conducted by Colorado State University. The study indicated that the plants most heavily visited by honeybees in the study area were in the Aster and Mint families. Individual plants most visited were Golden rod, Catnip and Globe thistle. Globe thistle grows well in dry areas like Calgary and is often used for the back borders of gardens.

Unless you are allergic to bees, don't be afraid of attracting pollinators to your property. The stinging insects that give most people trouble are wasps (yellow jackets) and hornets and they aren’t bees and they aren’t attracted by bee-friendly plants.

2. Use your lawn to help the bees

Contrary to popular belief, a lawn full of clover and dandelions is a good thing as it is a haven for honeybees and native pollinators. Wildflowers, many of which might be classified as weeds, are some of the most important food sources for native bees and honeybees. For many, the lawn represents the largest area we can use to help bees assuming it has not been treated with herbicides or pesticides and we can resist the social norm of a sterile monoculture lawn.

Here are a few ideas to make your lawn a great place for bees and other wildlife.

Create a clover lawn or at least let what you have continue to grow. Bees love clover and it is a main source of nectar during the summer. White Dutch clover provides nitrogen to the lawn, stays green and short all summer, is fragrant and looks beautiful not to mention, clover it has a high rate of replacing nectar so bees can visit the same flower over and over again for food. Details on how and why to grow a clover lawn can be found at:

https://dengarden.com/gardening/ecological-lawn
http://homegardenjoy.com/site/2016/03/leave-clover-lawn.html

Let your dandelions grow or hand dig them. Dandelions are one of the first foods available for bees after a long winter. When they start to grow and provide nectar, this signals the overwintered queen bees to start laying the first eggs of her summer colony. Dandelions ensure a healthy start to the colony.

Photo by Cherie Andrews – Chinook Honey

If you can't tolerate dandelions, don't spray them with herbicides that will kill the visiting bees. Digging dandelions not only spares the bees but dandelions are edible and can

be used as a healthy food source for people too. Here are some links to websites with recipes for dandelion wine, teas, soups, salads and more. Make sure you do not harvest dandelions from a place that may have been sprayed with herbicides.

http://www.eattheweeds.com/dandelions-hear-them-roar/
http://www.theprairiehomestead.com/2014/04/dandelion-recipes.html

Other low growing flowers or herbs such as varieties of creeping thyme make beautiful additions to a bee-friendly lawn.

If you have young children who may be barefoot or in open-toed sandals, they can get stung by foraging bees. Bees are not deliberately out to sting anyone but stings can happen if a bee gets stepped on. You may wish to wait until your kids are a little older before planting a bee-friendly yard.

3. Provide water by making a bee waterer

All animals including honeybees and native pollinators need water to survive. Bees need water to drink and they use water to cool the hive and keep it the right temperature for developing brood in hot weather. They cool the hive using ventilation and use the water for evaporative cooling.

In a dry area like southern Alberta, finding water is a challenge. It takes several hundred workers to collect the water needed by the colony. By placing water close to your hives or native bee nests, they do not have to travel as far for water and can use their energies to forage more for nectar and pollen.

Insects can easily become trapped and drown in water containers so no matter what the design of waterer, make sure there is a landing spot or something for the bees to comfortably cling. Containers with floating drift wood or sticks leaning again the inside of the water container work well as the bees always have access regardless of the level of water. Containers with pebbles or even marbles work too but make sure portions of the pebbles remain dry for the bees to land on. Consider adding a water feature like a reflecting pond or fountain that enhances the beauty of the yard as well as helps the bees. Bees seem to love soaker hoses or even a puddle that is kept full beneath a dripping facet. Pet or fowl watering devices can be modified for a replenishing water supply. Using a shallow bird waterer works as long as it contains some places for the bees to land and it is refilled on a regular basis especially on hot days.

Once water is provided, the bees come to depend on the source so make sure there is always water for them. To initially attract the bees, a couple of drops of lemongrass or other essential oils can be added to the water. Place waterers away from pets and where the water may be exposed to pesticide use.

The presence of water near the nesting habitat of native pollinators can significantly increase their chance of survival and pollination activities. Some pollinators such as mason bees use mud to construct their nests (see more under providing nesting space and shelter).

4. Think twice about using garden and lawn pesticides

Using herbicides and pesticides sure make a yard look pristine and pretty. Unfortunately, they can be a major threat to the survival of the bees. Chemicals and pest treatments on lawns and in gardens cause damage to the bee's system and if the bee is not killed outright, the chemical shortens the life of the bee. These treatments are especially damaging if applied when the flowers are in bloom as they will get into the pollen and nectar and taken back to the hive or nest (if the bee makes it that far) and incorporated into the honey. This contaminated honey is eaten then eaten by the bee larvae or harvested and eaten by us.

According to organic gardeners, adding plants that attract natural pest-eaters like wasps and including plants that naturally repel pests, such as garlic to protect from aphids and basil to protect tomatoes, are good strategies to reduce chemical needs. Maintaining fertile soil to grow healthy plants can also help the plant resist pests.

5. Create nesting sites for bees

A secure place to live is crucial to native solitary and colony bees. Unlike honeybees, which live in wooden hives with frames which beekeepers provide, native bees nest in everything from abandoned animal burrows, dead trees and branches to hollow plant stems. Each bee species has their own habitat requirements although most bees prefer sunny areas with some protection from the wind.

About 90% of Alberta's bee species are solitary which means each female bee creates her own nest containing a few eggs in individual cells. Solitary nests are usually in the ground, in crevices or in hollow plant stems. Another group of native bees are the bumble bees which are social like the honeybees. Honeybees winter with the queen bee being surrounded and fed all winter by the worker bees. Bumble bee queens however, burrow down into the ground to hibernate during the winter and all of the workers succumb to the cold. Each spring the queen emerges and starts laying eggs to start new colonies of bees. Bumble bees tend to live in small cavities that are usually at ground level but can be found higher when they enter into openings in sheds, garages, homes or even abandoned bird houses.

Leave some undisturbed yard. All of these bees can benefit if you provide a little bare ground or exposed garden soil. Many of our solitary bees dig a nest in the ground to raise their young. They can't do this if grass or mulch is in the way. Areas that are undisturbed with some leaf litter, pieces of wood, lose soil and dry plants with hollow-stemmed plants are great shelters for ground-nesting bees.

Make a home for the bees. To make a home for bees like Mason bees, take some blocks of unpreserved wood and drilling holes of various sizes. Place an old log or stumps in a sunny area and drill some holes horizontally on the southeast facing side. Gather plants with hollow stems and leave them in an undisturbed portion of the yard. This offers habitat to the many bee species that nest in pre-existing holes. Mason bees are docile native pollinators that don't sting and can be raised with minimal effort. For bumble bees that prefer homes in small cavities such as vole holes or under logs or wood, you can place pieces of wood in undisturbed portions of your yard leaving a cavity below. If you prefer, you can purchase lots of different bee blocks or bee homes from online or check out gardening stores.

Tips:

If you come across a native bee nest, try not to disturb it as solitary or bumble bee nests only last one season.

Be careful not to mistake solitary bees for wasps as some of them look the same.

Resist cleaning up the hollow stemmed plants in your garden until the spring. The stems may have tiny, native bees hibernating inside of them.

Some people leave their bee houses outside during the winter; however, the bees are more likely to survive if you eliminate parasites and risks to the colony by caring for the cocoons during the winter months.

Many solitary bees like Mason bees need a source of mud to construct their individual bee nests.

6. Help protect honeybee swarms

Swarming is a natural process when colonies of honeybees can increase their numbers. If you see a swarm or have bees residing in your shed or portion of your home, contact Calgary and District Beekeepers at Calgarybeekeepers.com who will collect the swarm and relocate it to a safe and permanent place. Honeybees in a swarm are usually very gentle and present very little danger. They can be made aggressive if disturbed or sprayed with water. Just leave them alone and wait for a competent beekeeper to arrive.

7. Rescue unwanted bumble bee colonies

If you have a bumble bee colony in your yard and it is an inappropriate location for you, please contact Calgary and District Beekeepers at Calgarybeekeepers.com. They can discuss options, one of which may be the rescue and relocation of the bumble bee colony to a more favourable location. People contact Calgary and District Beekeepers to remove colonies but numerous people also contact them because they want to provide a home for the rescued colonies.

To avoid having bumble bee queens set up a colony in your house or shed, always ensure that openings to your home or shed are well sealed. Openings under soffits, around older windows or doors, or around mechanical conduits leading into your home are just a few ways a queen bee can enter into your garage or home walls and set up a colony. By eliminating these unwanted colonies that are often destroyed, the queen bee looks elsewhere and will establish a colony at a location that may not require moving or eradication.

8. Speak to your political representatives

In general, local councils and provincial representatives can help bees and other pollinators by creating and preserving bee-friendly habitats, by minimizing use of pesticides, by encouraging education and awareness and by passing bee-friendly bylaws and regulations.

Here are a few ideas. Additional suggestions can be found at www.buzzaboutbees.net/save-the-bees.html

Consider asking your council to:

- Decrease mowing along roadsides and medians. The government, both local and provincial, spends millions every year cutting extensive areas of vegetation. Not only can a lot of money be saved by not cutting all these areas but wonderful habitat could be saved for pollinators. Roadsides contain a variety of wildflowers and shrubs that are often cut just before they bloom or when they are in bloom. Be aware however, that there are sometimes good reasons why a roadside must be mown especially if visibility becomes an issue. Councils may also be pressured to mow areas and use chemicals by individuals who prefer a pristine looks over one that supports pollinators and other wildlife. Wildflowers and shrubs do tend to trap litter more easily than neatly mown ones and it is the sight of litter that may prompt the public to call and complain.
- Leave some un-manicured areas in parks so there are places for native bees to make homes.
- Leave areas of undeveloped land because even derelict sites can become a home to pollinators.
- Encourage other publicly funded bodies to help bees and pollinators. A garden outside a hospital or police station could be designed with bees and pollinators in mind.
- Avoid using harmful pesticides in public spaces.
- Create a local 'Pollinator Protection Plan' with specific actions to protect pollinators for City employees and their contractors.

Ask provincial regulators to develop mowing reduction and meadow creation programs like the one developed by Maryland Department of Transportation. In Maryland, meadow restoration occurs along roadside medians, shoulders and near storm water management facilities. "Planting native meadow species is not only a great way to reduce mowing, it adds beauty and provides habitat for wildlife," said Acting Administrator Doug Simmons.

Contact your representatives and encourage others to do the same.

9. Support your local beekeepers

There are health benefits to eating local honey, purchasing local honey helps the beekeeper to cover the costs of beekeeping and it helps keep food miles down. So seek out your local beekeeper and buy their honey. Beekeepers often sell their honey at local farmer's markets or find the beekeeper who may be in your community. Local honey complies with food standard requirements and is unpasteurized. It is not recommended

for infants under 1 years of age or for pregnant women. For the rest of us, unpasteurized honey contains the beneficial antibacterial and antimicrobial qualities that are destroyed by pasteurization. Treat yourself to some filtered or comb honey and enjoy one of nature's treats. It tastes quite different to foreign honey and has the flavour of the local flora.

People who live in an area with good existing bee habitat can contact Calgarybeekeepers.com and offer to host a honeybee hive or two. You will be put in contact with a local beekeeper who may be looking for a place to put his/her hives.

10. Learn about bees and understand they are not out to get you

Bees have been around for about 25 million years and are ideally adapted to their natural environment. Without pollinators like bees, the environment would be dramatically diminished. Honeybees are the only insects that provide food for man.

Bees are vegetarians. Honeybees forage for pollen and nectar from flowers up to four kilometers from their hive and bring pollen back to the hive in pollen baskets on their legs and nectar in their honey stomachs. This provides protein (pollen) and carbohydrates (nectar) for themselves and their larvae. Native bees collect pollen and nectar to place in their nests for the larvae and for themselves. Only honeybees store honey to sustain the workers and queen through the winter. The drones are driven out of the hive as winter approaches to conserve the honey supply.

Many native bees, including mason bees do not have a stinger and can't sting you. Bumble bees and honey bees have stingers but seldom use them unless they feel threatened. Honeybee workers die after they sting because their stingers are barbed whereas bumble bees have a straight stinger and can sting numerous times and survive. Wasps are not bees; they are carnivores so they eat garden insects and are attracted to BBQs and sweet drinks. Here are a few tips to avoid getting stung.

1. If a bee hovers inquiringly in front of you, do not flap your hands. Stay calm and move slowly toward shade if a bee is around you or lands on you. The bee will soon lose interest. Bees will land on you especially if you look or smell like a flower.

2. Don't stand in front of a hive opening, or a pathway to a concentration of flowers. Bees are busy flying back and forth from the hive, and if you get in their way, they may sting you.

3. Learn to differentiate between honeybees and wasps which are not bees and can be more aggressive.

4. When near hives, don't dress in dark clothing or where leather clothing that may make you look and smell like a hairy animal.

When kept properly, honeybees are good neighbours, and only sting when provoked.

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