

INVITE NATIVE POLLINATORS TO YOUR BACKYARD

Most wild honeybee colonies have been destroyed by mites and the resulting lack of pollination has become serious, so it is critical that our many species of native pollen bees be protected and increased. About one third of the world food supply depends directly upon pollination and almost another third depends indirectly upon pollination (the production of meat, eggs and milk for instance require clover, alfalfa, etc. which is fed to the animals).

There are several things that can be done to attract and increase the many native pollinators to your yard. Since there are many good books available that describe how to attract butterflies, hummingbirds and bats to your yard, only pollen bees will be discussed here. Pollen bees usually don't resemble honeybees. They come in many sizes and they may be metallic green or blue, grey or black, some may be smooth and shiny, others fuzzy. To increase their numbers, plant adequate nectar and pollen producing plants and trees to provide food over the entire season. Most flowers, herbs and flowering trees and shrubs provide food for these gentle pollinators. The blossoms or flowers should be the old fashioned single varieties, as the fancier double flowers usually provide little if any nectar or pollen.

Most wild bees are solitary and make their nests in old beetle holes in wood, or nest underground in sunny soils. Some are severely limited by the lack of nest holes. Their numbers can be greatly increased by providing wooden blocks with many holes. Most of these native bees (although solitary) are gregarious and actually prefer to nest next to others.

The nest blocks are fairly simple to make; any well seasoned scrap wood will do but pine and fir are easier to work with. DO NOT use treated lumber, it is toxic. I use 7" lengths of either 2"x 4" or 4"x 4" with holes drilled 6" deep in one end. Holes must be drilled with a bradpoint bit (dowel bit) for smoothness. The most preferred size hole is 5/16" for the orchard mason (blue orchard) bee, but 1/4" and smaller holes will sometimes also attract some of the smaller species of bees. You can also attract the various *Ceratina* species by bundling groups of elderberry stems or other pithy stems together in a sheltered location.

All blocks must be placed out of the direct sun in a dry sheltered location preferably on or at the East side of a building or they may be placed on a shelf in a shed or carport that is always open. It is ideal to place them about 6' off the ground for easy viewing and out of the reach of children or pets. These bees are very gentle and will not sting unless caught and pinched. Their sting is much milder than even a mosquito bite.

Blocks should be placed out near the end of March or early April. The bees will fill the holes in the blocks and cap them with mud or leaf material between April and July depending upon species. Do not move or handle the block after the bees have started nests, until about September when the bees have become dormant adults in their "cocoon" waiting to hatch next Spring. They may be moved to a new location after September, if desired. Note: Sometimes Potter Wasps use the 5/16" holes also. They resemble the common paper wasps and do not interfere with the pollen bees, are very beneficial and should be welcomed. They have been observed carrying back green cabbage loopers, sawfly larvae and apple maggots to their nest holes.

If you wish to check the level of pollination and you have an apple tree in your area, just cut some of the apples crossways and count the number of plump brown seeds. There should be 10 plump brown seeds in a perfectly pollinated apple, and not less than 7 fully developed seeds in any case. You will note that there are 5 seed pockets with 2 possible seeds in each. Any pockets with less than 2 seeds or with white seeds or shriveled brown seeds indicate poor pollination.

The most obvious sign of poor pollination can be found in the *Cucurbitaceae* family (squash, pumpkin, cucumber, melon, etc.) These plants have both male and female blossoms and require several trips back and forth between blossoms to provide perfect pollination. For instance whenever you find underdeveloped or white seeds in a watermelon, it is a result of poor pollination. A poorly pollinated fruit of any kind will also be deformed and bitter compared to a perfectly pollinated fruit.

If you are rearing any of the pollen bees in blocks as previously described, they should be placed in the orchard about a week before the "king" blossoms are ready to open. Apples usually bloom in clusters of 5 blossoms. The center and strongest blossom is called the "king" blossom, because it opens first and produces the best apple of any blossom in the cluster. When nature provides us with perfect weather and the "king" blossoms are not killed by frost, they produce a growth inhibitor which thins the other blossoms so that you get only the very best fruit.

(Attached is a list of nectar and pollen plants which can help to support a healthy bee population throughout the year.)

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The purpose of this work is to promote the use of pollen bees and the conservation of native bees. Permission is granted to reproduce and distribute this paper for non-commercial purposes wherever it can further the aforementioned goals.

Since this paper was written, new diseases and pests (colony collapse disease CCD, etc.) have further decimated the honeybee populations and the pollination problems have reached a crisis level.

Also, many new nesting materials for solitary bees can now be purchased and I have tested about 25 different materials for various researchers and found Dr. Karen Strickler's Binderboard® with paper straw inserts to be the best and most convenient to use. It can be purchased directly from her website <http://www.pollinatorparadise.com>

SOME PLANTS / TREES PRODUCING POLLEN AND / OR NECTAR

Alfalfa	Hawthorn (all species)
Amur Honeysuckle	Herbs (flowering)
Anise Hyssop	Hollyhock (single)
Apple	Honeysuckle
Asters	Iris
Autumn Olive	Juneberry
Azalea	<i>Lespedeza</i>
Basswood	Maple, Red (<i>Acer rubrum</i>)
Bedstraw (all species)	Maples, Other
Berries (all species)	Milkweed
Birdsfoot trefoil	Mints (all species)
Black Locust	Mustard (all species)
Buckwheat	Nasturtiums
Calendula (single)	Orchids
Canola	Peach
Catalpa	Peppers
Catnip	<i>Phacelia</i>
Citrus (all kinds)	Plum
Chestnut	Potato
Chinkapin	Rhododendron
Chives	Russian Sage
Chokecherry (and other cherries)	Sassafras
Clover (all species)	Serviceberry
Cole crops	Soy beans
Comfrey	Spring bulbs (most)
Crocus, bunch flowering	Staghorn Sumac
Crownvetch	Sunflower (and other similar composite flowers)
Dandelion	Sweetclover (yellow & white)
Dogwood (all species)	Thyme
Eggplant	Tomato
<i>Eranthis hyemalis</i>	Tulip poplar
Fruit Trees (all species)	Tupelo
Goldenrod (all species)	Valerian
Grape	
Greek Oregano	
Gumtree	

In general, plants with colorful fragrant flowers attract bees, flies, butterflies and beetles as pollinators. White or pale flowers that open at night usually are pollinated by moths, and deep-throated red or orange flowers attract hummingbirds. Flowers of grasses, grain crops and many trees are pollinated by the wind.

POLLEN BEES CURRENTLY BEING USED FOR POLLINATION

<u>NATIVE BEE SPECIES</u>	<u>Nest Type</u>	<u>Use of Bee</u>
Orchard Mason (Blue Orchard) Bee (Western) <i>Osmia lignaria propinqua</i> Cresson	Nests in holes	Orchard Pollination
Orchard Mason (Blue Orchard) Bee (Eastern) <i>Osmia lignaria lignaria</i> Say	Nests in holes	Orchard Pollination
Bullheaded Mason Bee <i>Osmia bucephala</i>	Nests in holes	Being tested for berry pollination
Tiny Carpenter Bees Several <i>Ceratina</i> Species	Nests in pith	Melon pollination and other crops
Squash Bees Several <i>Peponapis</i> Species	Nests in the ground	Squashes, pumpkin and gourds
Blueberry Bee <i>Osmia ribifloris</i>	Nests in holes	Blueberries
Blueberry Bee <i>Hapropoda laboriosa</i>	Holes in ground	Blueberries
Alkali Bee <i>Nomia melanderi</i>	Holes in ground	Alfalfa Seed Production
Also native Bumblebees Several <i>Bombus</i> Species	In mouse nests or cotton	Various crops, especially blueberries and tomatoes
Mustached Mud Bee <i>Anthophora abrupta</i>	In adobe blocks	Being tested for cranberries
Onion Bee <i>Heriades carinata</i>	1/8" holes in blocks	Various herbs, oregano, Alliums

IMPORTED BEE SPECIES

Hornfaced Bee (Imported from Japan) <i>Osmia cornifrons</i>	Nests in holes	Orchard pollination
Shaggy Fuzzyfoot Bee (Imported from Japan) <i>Anthophora pilipes villosula</i>	In adobe blocks	Orchards and blueberries in Southeast
European Osmia (Introduced from Europe) <i>Osmia coerulescens</i> (naturalized in New York for many years)	Nests in holes	Clover pollination
Alfalfa Leafcutter Bee (Introduced from Europe) <i>Megachile rotundata</i>	Nests in holes	Alfalfa seed production
Honeybee (Imported from Europe) <i>Apis mellifera</i>	Nests in hives	Various crops and honey production
Giant Resin Bee (Accidentally introduced from Central Asia) <i>Megachile sculpturalis Smith</i>	Nests in holes	Legumes