Honeybee Conservation Pack

www.moraybeekeepers.co.uk

SCOTTISH CHARITY NUMBER SC042185

Moray Beekeepers' Association

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Honeybees are truly the gardener's friend and are not the killer beast depicted in the cinema. If not for them and the other species of bees, plant life would be reduced to mainly wind-pollinated grasses and trees, as bees pollinate most of the flowering plants. Their value to food production is priceless as they pollinate many of the crops grown worldwide.

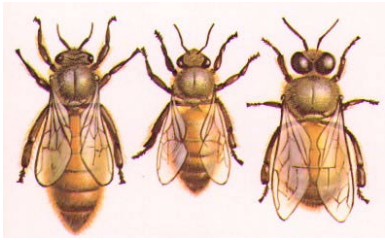



The native bee *Apis mellifera mellifera* is one of many species of bee that belong to the insect order Hymenoptera and they have been associated with humans for a long time. Cave paintings depict the harvesting of honey 8,000 years ago and it was the main sweetener of food until sugar was introduced, and beeswax candles were used for illumination.

Unlike most insects, honeybees remain active throughout the winter surviving on the honey, produced from nectar, they have stored in the summer.

One of their less favourable attributes is their sting only present in the worker bee. When threatened, honeybees will swarm out and attack with their stingers to drive the enemy away, but generally as they forage around they are quite harmless and only sting if accidentally caught in clothing.

Honeybees are social insects and create elaborate nests, or hives, containing up to 40,000 individuals during the summer months. Working together in a highly structured social order, each bee belongs to one of three specialized groups called **castes** - **queens**, **drones** and **workers**.



Queen *Worker* *Drone*

Queen and her retinue of workers

Drones on the left, worker on right

There is one **queen** in a hive and her main purpose in life is to make more bees. When active she can lay over 1,500 eggs per day and will live for two to eight years. She is larger and has a longer abdomen than the workers or drones, which she controls by emitting chemical signals called pheromones, the main one being **'queen substance'**.

The **drones** are male. They live about eight weeks, only a few hundred are ever present in the hive and their sole function is to mate with a new queen, if one is produced. They are bigger than the workers with much larger eyes. At the end of the season they are considered non-essential and are driven out of the hive by the workers to die.

Worker bees are infertile females making up the majority of the colony and doing all the different tasks to maintain and operate the hive, including; making honeycomb, feeding the brood, queen and drones,

cleaning, temperature regulation (by beating their wings) and defending the hive. Older workers forage outside the hive and gather nectar, pollen, water and certain sticky plant resins used in hive construction. Workers born early in the season will live about 6 weeks while those born in the autumn will live until the following spring. Workers are about 12 mm long and highly specialized for what they do, with a structure called a pollen basket on each hind leg, an extra stomach for storing and transporting nectar or honey and four pairs of special glands that secrete beeswax on the underside of their abdomen. They have a straight, barbed stinger that can only be used once. It rips out of their abdomen after use, which kills the bee.

As well as flower nectar, pollen is a food source for the bees providing protein and other essential nutrients. Some of this pollen rubs off on the next flower they visit, fertilizing the flower and resulting in better fruit production. It sticks to the fuzzy hairs that cover their bodies and is carried back to the hive in the pollen baskets.



Native plants are preferred by the bees to provide nectar. Hawthorn, white clover, heather and blackberry are some of the better providers and dandelions are in bloom early in the year when the bees are becoming active. *Cotoneaster horizontalis* is a popular garden shrub for the bees.

Honeybees are undoubtedly under threat and it is estimated that 90% of all wild colonies have died in the last 5 years or so. Reasons for this include loss of natural habitat such as natural pastureland and the destruction of hedges etc as agricultural practices have changed. Recently the spread of the Varroa mite among the bee population has threatened their future as it debilitates the bees by sucking their blood and carries various secondary infections. The increased use of neonicotinoid insecticides by farmers is also thought to have contributed to the honeybees' decline.

How Can I Help?

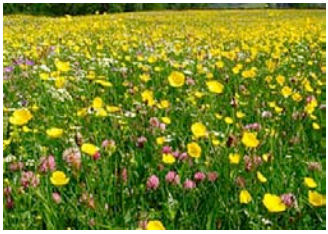
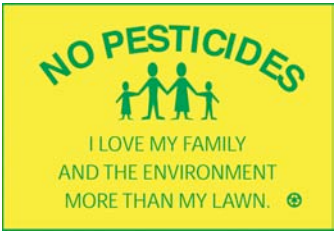
Grow bee friendly flowers and shrubs in your garden!

Plant meadows not lawns!

Bee friendly, i.e. don't use pesticides or insecticides!

Make space for beehives!

Buy local honey as this helps local beekeepers cover the costs of protecting the bees!

And, Support your local Beekeeping Association!

MORAY BEEKEEPERS' ASSOCIATION

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HOW TO HELP THE HONEY BEE

It is widely accepted that most wild honeybee colonies have died out in the U.K. and this is due to the loss of much of the natural hedgerows and pastureland, increased use of pesticides, diseases, and pests. Without beekeepers and conservation minded people to care for them honeybees could disappear in a few years.

Plant bee friendly flowers and shrubs
Where there are few agricultural crops, honeybees rely upon garden flowers for a diverse diet of nectar and pollen. Encourage honeybees to visit your garden by planting single flowering plants and vegetables. Go for the allium family, all the mints, beans and flowering herbs. Bees like daisy shaped flowers - asters and sunflowers, also tall plants- hollyhocks, larkspur and foxgloves.

Bee friendly
If you use pesticides in your garden it will kill honeybees, butterflies, bumblebees and other species of bees that are actually beneficial to the environment. Weed killer can cause similar fatalities so bee friendly and consider the impact your use of chemicals can have on the environment. Bees only sting in self defence, e.g. when guarding the hive. Away from the hive they are not aggressive and quite docile, going about their business without bothering anybody so don't you bother them. If a bee flies past or buzzes around your head, don't flap your hands at it – if you leave it bee it will fly off on its own.

Find space for beehives
Many would- be beekeepers, especially in urban areas, find it difficult to find a safe space for their colony of bees. If you have some space in your garden, or know someone who has, contact your local beekeeping association and they could find a beekeeper in need of a site. It is amazing what a difference a beehive will make in a garden. Crops of peas and beans will be better, fruit trees will crop well with well-formed fruit and your garden will be buzzing!

Plant meadow not lawns
Why not convert some of your lawn area to a wildflower meadow? As well as looking beautiful in mid summer you will attract all manner of nectar seeking insects including honeybees, providing them with a valuable source of food.

Protect swarms
Swarming is the natural process by which colonies of honeybees increase their numbers. If you see a swarm contact the local authority or the police - they will contact a local beekeeper to collect the swarm. 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.

Buy local honey
Buying local honey helps local beekeepers to cover the costs of protecting bees. Local honey is 100% natural and complies with all food standards requirements without damage to the honey. It tastes different to foreign supermarket honey and has a flavour that reflects the local flora.

Join Moray Beekeepers' Association
Beekeeping is an enjoyable, fascinating and interesting hobby – and you get to eat your own honey too. Local beekeeping associations run courses every year to help new people take up beekeeping, find the equipment they need and a colony of bees. They welcome people interested in beekeeping to observe apiary meetings in the summer and may be in a position to source you with local bees. You don't need to be a beekeeper though – just have an interest in honeybee conservation and the environment.

Make a donation towards honeybee conservation projects at www.moraybeekeepers.co.uk

Learn more about this fascinating insect
Beekeeping is a fascinating hobby. Honeybees are no ordinary insects, but rather *extraordinary* insects! Without them, the environment would suffer and the food on your plate would undoubtedly be diminished. Why not invite a beekeeper to come and talk to any local group you support and give an illustrated talk about the honeybee and products of the hive. They might bring honey too! YUM, YUM!

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GARDENING FOR BEES

Bees look to flowers to provide them with nectar and pollen - without these two vital sources, bees cannot stay alive. But not all flowers need bees and not all flowers provide suitable food for bees.

Spiky stems with lots of smaller flowers are good bee plants; single, 'flat' flowers, like any of the daisy family are ideal; bell-shaped flowers, too, will provide a useful source of food, although some are better suited to bumble bees rather than honey bees.

The nearer the cultivated plant is to its wild, 'natural' original the better it is for bees. Highly bred or hybridized plants often have double flowers that render them sterile, and they often have no nectaries. Wild flowers are the best and many herbs are ideal bee plants. That is not to say, however, that cultivated plants are not suitable - just look out for ones with bee friendly characteristics.

You can help ensure they have a diverse diet and can provide nectar and pollen and so encourage honeybees to visit your garden by planting single flowering plants and vegetables. Go for all the allium family, all the mints, all beans except French beans and flowering herbs.

Bees like daisy-shaped flowers - asters and sunflowers, also tall plants like hollyhocks, larkspur and foxgloves. Plants with nectar or pollen flowers that bloom in winter / early spring are essential so please plant snowdrops and crocus, witch-hazel and pussy willow.

Note: the common dandelion is one of the most important early bloomers for honeybees.

Summer normally sees bees spoilt for choice, unless of course it is too wet for them to get to the flowers. Later on, they feed on aster, comfry, zinnia, echium, and the much-reviled hymalayan balsam.

The very last nectar is obtained from ivy, as late as November.

What bees like

- Plants with lots of small flowers like lavender
- Open, single flowers such as asters or daisies
- Bell shaped flowers such as foxgloves
- Herbs
- Lots of variety
- Plants native to Britain
- Wildflowers and 'weeds' like dandelions
- Fruit trees

What bees don't like

- Exotic or highly cultivated flowers that are not indigenous to the UK
- Double or elaborate flowers as they often contain little or no nectar
- And most annual bedding plants for the same reason

FLOWERS & SHRUBS FOR BEES

Spring

Apple
Arabis
Bluebell
Broom
Bugle
Cherry
Crab apple
Crocus
Dandelion
Flowering Currant
Forget-me-not
Hawthorn
Hellebore
Pear
Plum
Pulmonaria
Pussy Willow
Rape (Oil seed rape)
Red dead-nettle
Rosemary
Snowdrop
Thrift
Viburnum
White dead-nettle

Early Summer

Allium
Aquilegia
Astilbe
Beans (not French)
Birds-foot Trefoil
Bush Vetch
Campanula
Ceanothus
Chives
Clover (white)
Comfrey
Cotoneaster
Escallonia
Fennel
Foxglove
Geranium
Honeysuckle
Kidney Vetch
Laburnum
Lupin
Phacelia
Rosebay willowherb
Sainfoin
Sweet pea
(everlasting type)
Thistle
Wallflower
(everlasting)

Late Summer

Angelica
Aster
Balsam
Borage
Bramble
(Blackberry)
Brassica
Buddleia
Catmint
Cornflower
Dahlia (single flowered)
Delphinium
Fuchsia
Heather
Hollyhocks
Hypericum
Ivy
Knapweed
Lavatera
Lavender
Marjoram
Michaelmas daisy
Mint
Penstemon
Poppy
Purple Loosestrife
Scabious
Sunflower

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SOLITARY BEES

Britain has more than 250 species of native bees and they all play a vital role in our gardens by pollinating flowers. But bee friendly flowers, especially wild flowers are becoming scarce, and with fewer nest sites available to the bees and an increased use of pesticides, 25% of our native bees are now listed as endangered species.

Out of the 250 species, 90% of them are known as solitary bees, i.e. a single female, after she emerges from her pupae and is mated by a male, constructs, provisions and lays an egg in each cell in a nest by herself. This is in comparison with social bees such as bumblebees, honeybees and sting less bees, all of which have a queen who lays eggs, with a number of workers who look after them.

Female solitary bees prepare their own nest in the ground, in cracks and crevices in walls, or in wood. They gather nectar and pollen as food for their own offspring but provide no further care after the eggs are laid.

Solitary bees come in many different sizes, shapes and colours from black to metallic green, blue or red and some resemble wasps.

Leafcutter Bees

Leafcutter bees nest in soft rotted wood, thick-stemmed pithy plants such as roses and similar material that the bees can easily cut through and excavate. Nest tunnels may extend several inches deep and coarse sawdust is thrown out at the entrance.

Leafcutter bee

Leafcutter bee nest

Leafcutter bee nest

Cutting a leaf

After the nest has been produced leafcutter bees collect fragments of leaves to construct individual nest cells. The bees cut leaves in a very distinctive manner making a smooth semi-circular cut about 20mm in diameter from the edges of leaves. These are carried back to the nest to make the individual cells within the previously constructed tunnel.

Each leaf-lined cell is then provisioned with a mixture of nectar and pollen. An egg is laid and the cell sealed producing a finished nest cell that resembles a cigar butt. A series of closely packed cells are produced in sequence so that a finished tunnel may contain a dozen or more cells forming a tube 10cm to 20cm long.

Adult females live for about 2 months and lay between 35 and 40 eggs.

Once the nest is finished the female caps it with a solid plug of cemented leaf pieces. She then deserts the nest leaving nature to take its course. The eggs hatch into larvae, consume the pollen ball and enter hibernation. The following spring the larvae pupate and turn into adults.

Leafcutter bees differ from related species as they collect pollen on their abdomens rather than on their hind legs.

Mining Bees

Mining bees are one of many familiar black and yellow summertime bees often mistaken for bumble bees. As their name suggests, they burrow down into the ground, in this country something like 30 to 45cm, where they make a labyrinth of tunnels in which they lay their eggs. The eggs will hatch out the following spring.



Mining bees are active in April/May for about 8 weeks only. Individual females live 4-6 weeks while male lifespan is less than half as long. They do not collect nectar nor do they sting although they can bite if handled roughly.

Mining bees have a docile disposition and like other bees are very beneficial to gardens. You can enhance miner bee populations by placing dried mud blocks in your garden for them to nest in.

Masonry Bees

Masonry bees prefer south facing nest sites and use naturally occurring holes in either the bricks themselves or in the mortar joints, which they excavate with their jaws.

Nests are established in spring or summer and contain 6 to 12 eggs, each in a cell provisioned with pollen and nectar, sealed, usually, with mud.

New adults emerge the following year to repeat the cycle

Carpenter Bees

The most common species of Carpenter bees resemble bumblebees except that they have a relatively smooth abdomen as opposed to the very hairy abdomens of bumblebees. Common Carpenter bees are about 20mm long but some species are smaller and have black or metallic colouration.

Carpenter bees dig holes in dead wood where they lay eggs and provision them with nectar and pollen.

Adults spend the winter in nests constructed the previous year and become active in April or May. After mating, females construct new nesting tunnels or use pre-existing tunnels, about 12mm wide, are clean cut and may extend 15 to 20 cm. Females collect pollen and nectar to produce a dough-like mass called ‘bee bread’ which the larvae feed on

Wool Carder Bees

This bee is named after the female's habit of scraping the hairs off plants, rather like carding wool. She uses the hairs to line a cavity in a wall, in timber or any other suitable place. The hairs are gathered together into a ball. She flies off carrying the ball of wool, which is sometimes as big as her! If you can watch the females 'carding' plant hairs, you may be lucky enough to witness one fly off with its cargo of 'wool' - it really is a fascinating sight.

Hairy leaved plants like Lamb's Ear or Lychnis coronaria are important for this purpose. Back at it's cavity nest, the female provisions cells with pollen collected from plants guarded by the male. She then lays eggs in the cells that develop into larvae that feed on the pollen provided by the 'mother'. The following season, in June and July, new males emerge, followed soon after by females, and the whole cycle starts again.

Cuckoo Bumblebees

In the UK there are 6 species of cuckoo bumblebees. They do not build their own nests but like cuckoo birds, these bees lay their eggs in other bees' nests. The female cuckoo bee stalks the nest of other bees and sneaks inside laying her own eggs that are then reared by the other workers.

Cuckoo bumblebees have no pollen baskets on their back legs and do not secrete wax for nest construction. There is no worker caste and all cuckoo bee eggs hatch as reproductive males or females.

Bumblebees

There are 25 different species of bumblebee found in the U.K. and 3 of these species are already extinct with a further 9 on the critically endangered list. They all vary in terms of body size, tongue length, colour patterns, nesting requirements and activity throughout the year and are therefore found in different habitats around the country. Scientists are warning that they could be wiped out within a few years.

Bumblebees, like honeybees, wasps and ants are all social insects: they live in a colony with a queen and her daughters (the workers). Bumblebees have an annual life cycle, with new nests being started each spring by queens. The queen bumblebees are very large, and from February onwards can be seen feeding on flowers such as willow catkins, bluebells and lungwort, or flying low over the ground searching for a nest site.

Some species prefer to nest underground in abandoned burrows of rodents, while others nest just above the ground in dense grass leaf-litter. The queen stocks her nest with pollen and nectar, and lays her first batch of eggs. She incubates them much as a bird would, sitting on the eggs while vibrating her flight muscles to produce warmth.

When the eggs hatch the legless grubs consume pollen and nectar, grow rapidly, and pupate after a few weeks. A few days later the first workers hatch from their pupae and begin helping their mother, expanding the nest and gathering food.

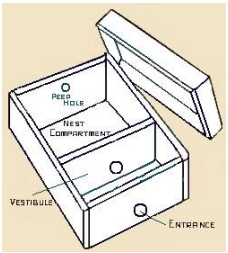
By mid-summer, nests of some species can contain several hundred workers. At this point the queen starts laying both male and female eggs. The females are fed extra food and become future queens. Both males and new queens leave the nest to mate and the new queens burrow into the ground to wait until the following spring. The males, workers, and the old queen die off in the autumn, leaving the nest to decay.

Making Homes for Bees

Finding nest sites has become crucially important for our bee population. You can give them a helping hand, improve pollination in your garden and give your family a lot of pleasure.

How to Build a Bumblebee Nest

Build a box of solid construction with removable top and two compartments, a vestibule that measures roughly 12.5cm by 15cm and serves as a staging ground where bees can defecate and set up defences from the main nesting compartment located at the back of the house.



The nesting compartment measures 20cm by 15cm and this is where queens will spend their lives.

Drill a peephole in the back wall with a flap so you can sneak a look inside to see what's happening. Line the floor with cardboard to make once a year cleaning easier. Use cotton and/or wood shavings as nest material in the rear compartment.

Site the box outside, off the ground, on two pieces of wood, to avoid damp. You can put the box almost anywhere in the garden, e.g. along a fencerow, under hedges, by a flower bed, around mulch piles or anywhere you have seen bumblebees foraging.

Other Types of Homes for Solitary Bees

Any type of cavity is likely to prove attractive to solitary bees.

Try putting up old, dry, hollow stems of plants like brambles. You can use bamboo canes or even drink straws, something about 6-10mm in diameter and 15cm long. Tie them in a bundle and fasten them horizontally to a tree or post about 1.5 metres of the ground, facing south.

Or you can place the canes in a wooden frame as shown in the middle photo above. Or you can drill lots of holes, 6-10mm in diameter and 15cm deep, in a block of untreated wood and hang as above. You can also drill holes in an old fence post or the like. Make sure the holes are drilled slightly upward into the wood and not too steep, as this will prevent rainwater collecting in the tunnels.

Finally, make sure you place your posts in a sunny position, ideally facing south and enjoy the bees.

Interesting Honeybee Facts

The honeybee is the only species of bee that produces honey in any quantity.

Honeybees communicate with each other by dancing on the comb.

They cannot see the colour red.

The Queen can lay her own body weight in eggs a day, up to 2,000.

The worker bees feed the queen exclusively on ‘Royal Jelly’

Honey is nectar that bees have repeatedly regurgitated and dehydrated.

One bee produces about one twelfth of a teaspoon of honey in its life.

To make one pound of honey, bees fly 55,000 miles and visit two million flowers.

Theoretically, the energy in one ounce of honey would provide one bee with enough energy to fly around the world.

The honeybee is not born knowing how to make honey; the younger bees are taught by the more experienced ones.

There can be up to 60,000 bees in a hive during the summer.

For information about keeping bees, beekeeping courses, honeybee conservation or a talk on honeybees, please e-mail

secretary@moraybeekeepers.co.uk