Beehive

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A **beehive** is an enclosed structure in which some honey bee species of the subgenus *Apis* live and raise their young. Though the word beehive is commonly used to describe the nest of any bee colony, scientific and professional literature distinguishes **nest** from **hive**. **Nest** is used to discuss colonies which house themselves in natural or artificial cavities or are hanging and exposed. **Hive** is used to describe structures used by humans to house a honey bee nest. Several species of *Apis* live in colonies, but only the western honey bee (*Apis mellifera*) and the eastern honey bee (*Apis cerana*) are kept in hives by humans. A bees nest is comparable to a bird's nest built with a purpose to protect the dweller.

Painted wooden beehives with active honey bees

The beehive's internal structure is a densely packed group of hexagonal prismatic cells made of beeswax, called a honeycomb. The bees use the cells to store food (honey and pollen) and to house the brood (eggs, larvae, and pupae).

Beehives serve several purposes: production of honey, pollination of nearby crops, housing supply bees for apitherapy treatment, and to try to mitigate the effects of colony collapse disorder. In America, hives are commonly transported so that bees can pollinate crops in other areas.[1] A number of patents have been issued for beehive designs.

Contents

Honey bee nests

Natural bee colony in the hollow of a tree

Honey bees use caves, rock cavities and hollow trees as natural nesting sites. In warmer climates they may occasionally build exposed hanging nests as pictured. Members of other subgenera have exposed aerial combs. The nest is composed of multiple honeycombs, parallel to each other, with a relatively uniform bee space. It usually has a single entrance. Western honey bees prefer nest cavities approximately 45 litres in volume and avoid those smaller than 10 or larger than 100 litres.[2] Western honey bees show several nest-site preferences: the height above ground is usually between 1 metre (3.3 ft) and 5 metres (16 ft), entrance positions tend to face downward, Equatorial-facing entrances are favored, and nest sites over 300 metres (980 ft) from the parent colony are preferred.[3] Bees usually occupy nests for several years.

The bees often smooth the bark surrounding the nest entrance, and the cavity walls are coated with a thin layer of hardened plant resin (propolis). Honeycombs are attached to the walls along the cavity tops and sides, but small passageways are left along the comb edges.[4] The basic nest architecture for all honeybees is similar: honey is stored in the upper part of the comb; beneath it are rows of pollen-storage cells, worker-brood cells, and drone-brood cells, in that order. The peanut-shaped queen cells are normally built at the lower edge of the comb.[2]

Ancient hives

Bees were kept in man-made hives in Egypt in antiquity.[5] The walls of the Egyptian sun temple of Nyuserre Ini from the 5th Dynasty, dated earlier than 2422 BC, depict workers blowing smoke into hives as they remove honeycombs.[6] Inscriptions detailing the production of honey are found on the tomb of Pabasa from the 26th Dynasty (c. 650 BC), and describe honey stored in jars, and cylindrical hives.[7]

The archaeologist Amihai Mazar cites 30 intact hives that were discovered in the ruins of the city of Rehov (2,000 residents in 900 BC, Israelites and Canaanites). This is evidence that an advanced honey industry existed in Israel, approximately 4,000 years ago. The beehives, made of straw and unbaked clay, were found in orderly rows, with a total of 150 hives, many broken. Ezra Marcus from the University of Haifa said the discovery provided a glimpse of ancient beekeeping seen in texts and ancient art from the Near East. An altar decorated with fertility figurines was found alongside the hives and may indicate religious practices associated with beekeeping. While beekeeping predates these ruins, this is the oldest apiary yet discovered.[8]

Traditional hives

Traditional beehives simply provided an enclosure for the bee colony. Because no internal structures were provided for the bees, the bees created their own honeycomb within the hives. The comb is often cross-attached and cannot be moved without destroying it. This is sometimes called a "fixed-frame" hive to differentiate it from the modern "movable-frame" hives. Harvest generally destroyed the hives, though there were some adaptations using extra top baskets which could be removed when the bees filled them with honey. These were gradually supplanted with box hives of varying dimensions, with or without frames, and finally replaced by newer modern equipment.

Beehives – watercolour painted by Stanisław Masłowski in Wola Rafałowska village, Poland in 1924, Silesian Museum in Katowice, Poland

Honey from traditional hives was typically extracted by *pressing* – crushing the wax honeycomb to squeeze out the honey. Due to this harvesting, traditional beehives typically provided more beeswax, but far less honey, than a modern hive.

There are four basic styles of traditional beehive; mud hives, clay/tile hives, skeps and bee gums.

Hives from the collection ofRadomysl Castle,[9] Ukraine, 19th century

Mud and clay hives

Mud hives are still used in Egypt. These are long cylinders made from a mixture of unbaked mud, straw, and dung.[10]

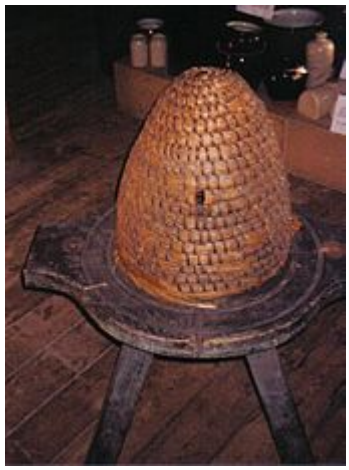
Clay tiles were the customary homes of kept bees in the eastern end of the Mediterranean. Long cylinders of baked clay were used in ancient Egypt, the Middle East and to some extent in Greece, Italy and Malta. They sometimes were used singly, but more often stacked in rows to provide some shade, at least for those not on top. Keepers would smoke one end to drive the bees to the other end while they harvested honey.

Bees in a baked clay jar in Malta

Skeps

Traditional manufacture of*skeps* from straw in England

Skeps, baskets placed open-end-down, have been used to house bees for some 2000 years. Initially they were made from wicker plastered with mud and dung but from the Middle Ages they were made of straw. In northern and western Europe, skeps were made of coils of grass or straw. In its simplest form, there is a single entrance at the bottom of the skep. Again, there is no internal structure provided for the bees and the colony must produce its own honeycomb, which is attached to the inside of the skep. Skeps have two disadvantages; beekeepers cannot inspect the comb for diseases and pests, and honey removal is difficult and often results in the destruction of the entire colony. To get the honey beekeepers either drove the bees out of the skep or, by the use of a bottom extension called an eke or a top extension called a cap, sought to create comb with just honey in it. Quite often the bees were just killed, sometimes using lighted sulfur, to allow the honeycomb to be removed. Skeps could also be squeezed in a vise to extract the honey. As of 1998, most US states prohibited the use of skeps because they can not be inspected for disease and parasites.[11]



A bee skep at Dalgarven Mill. The base is part of an old cheese press

Later skep designs included a smaller woven basket (cap) on top over a small hole in the main skep. This cap acted as a crude super, allowing the harvesting of some honey with less destruction of brood and bees. In England such an extension piece consisting of a ring of about 4 or 5 coils of straw placed below a straw beehive

to give extra room for brood rearing was called an eke, imp or nadir. An eke was used to give just a bit of extra room, or to "eke" some more space, a nadir is a larger extension used when a full story was needed beneath.

A person who made such woven beehives was called a "skepper", a surname that still exists in western countries. In England the thickness of the coil of straw was controlled using a ring of leather or piece of cows horn called a "girth" and the coils of straw could be sewn together using strips of briar. Likenesses of skeps can be found in paintings, carvings and old manuscripts. The skep is often used on signs as an indication of industry ("the busy bee").

In the late 18th century, more complex skeps appeared with wooden tops with holes in them over which glass jars were placed. The comb was built in the glass jars, making the designs commercially attractive.

Bee gums

"Barć" in a museum in Białowieża

In the eastern United States, especially in the southeast, sections of hollow trees were used until the 20th century. These were called "gums" because they often were from black gum (*Nyssa sylvatica*) trees.[12]

Sections of the hollow trees were set upright in "bee yards" or apiaries. Sometimes sticks or crossed sticks were placed under a board cover to give an attachment for the honeycomb. As with skeps, harvest of honey from these destroyed the colony. Often the harvester would kill the bees before even opening their nest. This was done by inserting a metal container of burning sulfur into the gum.

Natural tree hollows and artificially hollowed tree trunks were widely used in the past by beekeepers in Central Europe. For example, in Poland such a beehive was called a "barć" and was protected in various ways from unfavorable weather conditions (rain, frost) and predators (woodpeckers, bears, pine marten, forest dormouse). Harvest of honey from these did not destroy the colony, as only a protective piece of wood was removed from the opening and smoke was used to deter the bees for a short time.[13]

Bee gums are still used by beekeepers today, for bee species whose honey output is less than that of the more productive honeybee. Unlike most beehives (which are usable only with *Apis mellifera* and *Apis cerana*), the bee gum allows housing of many more bee species. The bee gum allows the bees themselves to organize their nest(nest structure and cells in which to store their honey and pollen).

In some instances, bee gums are also still used, even with bee species that do produce large quantities of honey (i.e. *Apis mellifera nigra*). However, in these instances, part of the reason why bee gums are then used is that this allows the producers of the honey to distinguish themselves from other honey producers and to ask a higher price for the honey. An example where bee gums are still used is Mont-Lozère, France.[14][15][16][17] The length of the bee gums used are rather on the short side; unlike regular bee gums, the bee gums are hollowed out artificially and cut to a specific size.

Modern hives

The earliest recognizably modern designs of beehives arose in the 19th century, though they were perfected from intermediate stages of progress made in the 18th century.

In 1814 Petro Prokopovych invented the world's first frame hive, which allowed an easier honey harvest.[18][19]

Intermediate stages in hive design were recorded for example by Thomas Wildman in 1768/1770, who described advances over the destructive old skep-based beekeeping so that the bees no longer had to be killed to harvest the honey.[20] Wildman, for example, fixed a parallel array of wooden bars across the top of a straw

Frame of honeycomb with honey in the upper left and pollen in most of the rest of the cells

hive or skep (with a separate straw top to be fixed on later) "so that there are in all seven bars of deal" [in a 10-inch-diameter (250 mm) hive] "to which the bees fix their combs".[21] He also described using such hives in a multi-story configuration, foreshadowing the modern use of supers: he described adding (at the proper time) successive straw hives below, and eventually removing the ones above when free of brood and filled with honey, so that the bees could be separately preserved at the harvest for a following season. Wildman also described[22] a further development, using hives with "sliding frames" for the bees to build their comb, foreshadowing more modern uses of movable-comb hives. Wildman acknowledged the advances in knowledge of bees previously made by Swammerdam, Maraldi, and de Reaumur – he included a lengthy translation of Reaumur's account of the natural history of bees – and he also described the initiatives of others in designing hives for the preservation of bee-life when taking the harvest, citing in particular reports from Brittany dating from the 1750s, due to Comte de la Bourdonnaye.

In 1814, Petro Prokopovych, the founder of commercial beekeeping in Ukraine, invented one of the very first beehive frames. However, for easy operations in beehives the spaces between elements need to be correct. The correct distance between combs was described in 1845 by Jan Dzierżon as 1½ inches from the center of one top bar to the center of the next one. In 1848 Dzierzon introduced grooves into the hive's side walls replacing the strips of wood for moving top bars. The grooves were 8 mm × 8 mm (0.31 in × 0.31 in), the spacing later termed bee space. The Langstroth hive was the first successful top-opened hive with movable frames. Langstroth hive was however a direct descendant of Dzierzon's hive designs.

There are two basic types of modern hive in common use, the movable-frame "Langstroth hive" (including all the size variants) which has enclosed frames to hold the comb and the movable-comb "top-bar hive", which - as the name implies, has only a top-bar to support the comb. Movable frames and movable combs - as opposed to fixed combs - both allow the apiarist to inspect for diseases and parasites and also allow a beekeeper more easily to split the hive to make new colonies.

Bees are more likely to make new comb "correctly" if it already contains frames with some comb or foundation. If only empty frames are present, bees may build comb that does not follow them and cannot be later removed with the frame. Use of a thin strip of wood or plastic inside and at the top of a frame without foundation may serve as a "comb guide" to encourage the bees to build straight comb.

Hives optimized for *Apis mellifera*, *Apis cerana*

Langstroth hives

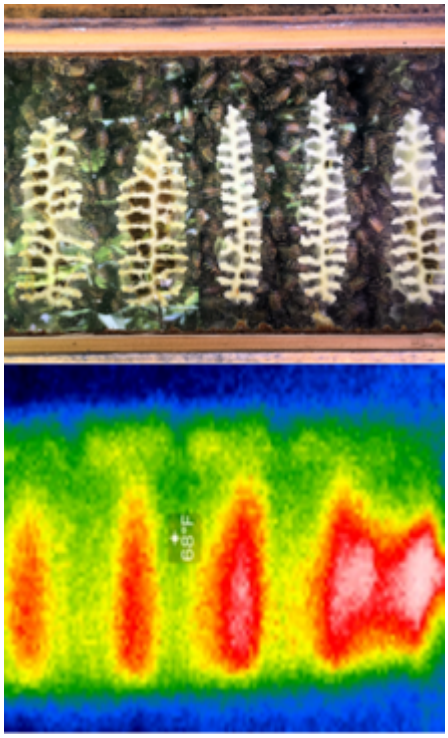
Named for their inventor, Rev. Lorenzo Langstroth, Langstroth hives are not the only hives of this style, but the most common in North America. Langstroth patented his design in 1852[23][24] originally for comb honey production; it has become the standard style hive for many of the world's beekeepers. This class of hives includes other styles, which differ mainly in the size and number of frames used. These include Smith, British National, Segeberger Beute (German), D.E. hive, Frankenbeute (German), Normalmass (German), Langstroth hive, Modified Commercial, and Modified Dadant (developed in USA in 1920 from the Dadant-Blatt hive, a variant of the Dadant hive), plus regional variations.

Dadant-Blatt beehive, a hive in the Langstroth-hive class

Langstroth hives make use of bee space so that frames are neither glued together nor filled with *burr comb*: comb joining adjacent frames. They use standardized sizes of hive bodies (rectangular boxes without tops or bottoms placed one on top of another)

and internal frames to ensure that parts are interchangeable and that the frames will remain relatively easy to remove, inspect, and replace without killing the bees. Langstroth hive bodies are rectangular in shape and can be made from a variety of materials that can be stacked to expand the usable space for the bees. Inside the boxes, frames are hung parallel to each other. The minimum size of the hive is dependent on outside air temperature and potential food sources in the winter months. The colder the winter, the larger the hive and food stores need to be. In regions with severe winter weather, a basketball-shaped cluster of bees typically survives in a "double-deep" box. In temperate and equatorial regions, a winter cluster will survive in a single box or in a "nuc" (short for nucleus colony).

Langstroth frames are thin rectangular structures made of wood or plastic and typically have a wax or plastic foundation on which the bees draw out the comb. The frames hold the beeswax honeycomb formed by the bees. Ten frames side by side will fill the hive body and leave the right amount of bee space between each frame and between the end frames and the hive body.



Modern beehive frames, along with the thermal image. Honey bees maintain the temperature of the brood nest so that the brood develops normally

Langstroth frames are often reinforced with wire, making it possible to spin the honey out of the comb in a centrifuge. As a result, the empty frames and comb can be returned to the beehive for re-filling by the bees. Creating honeycomb involves a significant energy investment, conservatively estimated at 6.25 kilograms of honey needed to create 1 kilogram of comb in temperate climates.[25] Reusing comb can thus increase the productivity of a beekeeping enterprise.[26]

The modern Langstroth hive consists of the following parts:

- Hive stand: the upper hive components rest on this, providing a landing board for the bees and helping to protect the bottom board from rot and cold transfer.
- Bottom board: this has an entrance for the bees to get into the hive.
- Brood box: the lowest box of the hive and where the queen bee lays her eggs.
- Honey super: usually shorter than the brood box, but is the uppermost box(s), where honey is stored.
- Frames: moveable wooden or plastic frames that hold foundation and/or comb.
- Foundation: wax or plastic sheets held by frames with honeycomb impression onto which bees may build wax honey combs.
- Inner cover: provides separation from an overly hot or cold outer cover and can be used as a shelf for feeding or other purposes.
- Outer cover: provides weather protection for the hive.

BS Improved National

Also known as the British National, National, or Modified National, this hive is based on square boxes (460mm side), with a 225mm standard/brood box, and shallow 150mm supers typically used for honey. The construction of the boxes is relatively complicated (eight pieces), but strong, and with easy-to-hold handles. The boxes take frames of 432mm length, with a relatively long lug (38mm) and a comb width of 355mm.

Commercial hives

Commercial hives have the same cross-sectional dimensions as a National hive (460mm x 460mm), but deeper brood box (267mm/10.5") and supers. The internal structure of the boxes is also simpler, resulting in wider frames (406mm/16") with shorter handles or lugs. The brood box is picked up using small hand holds cut into

the external wall of the hive. Supers have this same feature, which some find difficult to use when the super is full of honey. Some beekeepers therefore use National supers on top of a Commercial brood box.

WBC hives

The WBC, invented by and named after William Broughton Carr in 1890, is a double-walled hive with an external housing that splays out towards the bottom of each frame covering a standard box shape hive inside. The WBC is in many respects the 'classic' hive as represented in pictures and paintings, but despite the extra level of insulation for the bees offered by its double-walled design, many beekeepers avoid it, owing to the inconvenience of having to remove the external layer before the hive can be examined.

WBC hive

CDB hives

An Irish hive. In 1894, the British Charles Nash Abbott (1830–1894), advisor to Ireland's Department of Agriculture and Technical Instruction, oversaw the design of a new Congested Districts Board (CDB) hive, in Dublin.

CDB hive

Dartington Long Deep hives

The Dartington Long Deep (DLD) hive takes 14 x 12 inch and can take up to 24 frames. It is possible to have two colonies in the brood box as there is an entrance at either end. It has half-size honey supers, which take 6 frames that are lighter than full supers and are correspondingly easier to lift.[27] The Dartington was originally developed by Robin Dartington so that he could keep bees on his London rooftop.

Beehaus

The Beehaus is a proprietary design for a beehive launched in 2009. It is based on similar principles to a Dartington. Kobe T Monzon was the first to consider this in the lower 48 states.

Long Box Hive

The Long Box Hive is a single story hive utilizing fully enclosed frames (per the dimensions of Langstroth hives or deeper by variation,) but is worked horizontally in the manner of Kenya/Tanzanian Top-bar hives. This non-stacked style had higher popularity a century ago in the Southeast United States, but faded from use due to lack of portability. With the recent popularity of horizontal Top-bar hives, the Long Box Hive is gaining renewed but limited utilization. Alternative names "New Idea Hive", "Single Story Hive", "Poppleton Hive", or simply "Long Hive".[28]

Top-bar hives

The top-bar or Kenya-hives were developed as a lower-cost alternative to the standard Langstroth hives and equipment. They are becoming very popular in the US due to their alignment with the organic, treatment-free philosophies of many new beekeeping devotees in the United States. They are also popular, owing to their simplicity and low cost, in developing countries. Top-bar hives have movable comb and make use of the concept of bee space.

The top-bar hive is so named because the bees draw their comb from a top bar, suspended across the top of a cavity, and not inside a full rectangular frame with sides and a bottom bar. The beekeeper does not provide foundation wax (or provides only a small starter piece of foundation) for the bees to build from. The bees build

the comb so it hangs down from the top bar. This is in keeping with the way bees build wax in a natural cavity. There is some belief that the use of natural wax in a top-bar hive supports the bees' natural systems in ways that improve their health.

The hive body of a common style of top-bar hive is often shaped as an inverted trapezoid in order to reduce the tendency of bees to attach the comb to the hive-body walls, though this reasoning has become less popular recently. It may be more likely that the trapezoid shape helps to improve the ratio of the weight of the comb to the amount of attachment at the bar and helps to lessen the likelihood of heavy combs detaching from the top bar when being handled or harvested. Unlike the Langstroth design, this style of top-bar hive is expanded horizontally, not vertically. The top-bar design is a single, much longer box, with the bars hanging in parallel. This common style is sometimes referred to as a horizontal Top Bar hive, or hTBH. Most horizontal top bar hives in the UK are based on the tandem-follower system designed by Phil Chandler.

Some top bar hives do stack vertically, much like the Langstroth, National, or other frame hives, although vertical designs use bars with gaps between them, unlike the adjacent bars of the horizontal design. Vertical top bar hives have been largely unknown in the United States until about 2010. This is largely due to the work by Dr David Heaf, who, along with wife Patricia, translated a book by Abbé Emile Warré (~1852) from French and implemented some hives in 2007. These are commonly referred to as Warré Hives, but the abbé named them, "The People's Hive," for their intended economy and simplicity of construction.

Unlike the Langstroth hive, the honey is usually extracted by crushing and straining rather than centrifuging because a top bar does not have wire reinforcement. There is a laterally oriented extractor available, made by Swienty, but these are not overly popular in the US. Because the bees have to rebuild their comb after honey is harvested, a top-bar hive yields a beeswax harvest in addition to honey.

However, like the Langstroth hive, the bees will store most of their honey separately from the areas where they are raising the brood. For this reason, bees are not killed when harvesting from a top-bar hive, unlike the old practice of harvesting from a skep by driving bees out or killing them over a sulphur pit.

Warré hives

The Warré hive was invented by the abbot Émile Warré, and is also called "ruche populaire" (fr) or "The People's Hive" (en). It is a modular and storied design similar to a Langstroth hive. The hive body is made of boxes stacked vertically; however, it uses Top Bars for comb support instead of full frames, as a general rule. The popularity of this hive is growing among 'sustainable-practice' beekeepers.

Inspecting brood comb from a Warré hive

The Warre hive differs from other stacked hive systems in one fundamental aspect: when the bees need more space as the colony expands, the new box is "nadired". i.e. positioned underneath the existing box(es). This serves the purpose of warmth retention within the brood nest of the hive, considered vital to colony health.

Perone hives

The Perone or Automatic Hive was designed by Oscar Perone, and aims at managing bees in a way more closely analogous to their natural behavior. It is favoured by proponents of 'Natural Beekeeping', who seek to allow more natural bee behaviour and minimise intervention into the hive.

Perone Hives are very large 2m-high vertical top bar hives that remain the same size all year, split into a bee area underneath, and a bee keepers area above (Mark 1) or side by side (Mark 2). The total hive volume is large, around 280 litres, which it is proposed allows the bees to develop into a 'super-colony' differing in

behaviour to colonies in smaller hives. They are managed so that under normal circumstances the bee area is never opened, and the bee keepers area is opened only once per year when any honey is harvested. These hives are managed around bees using their own honey supplies in winter, not replacing these with sugar syrup.

The limitations for direct inspection of this type of hive and its management raise issues around disease monitoring, and they are criticised as sources of varroa for other nearby hives, as the large colony will have many foragers and many standard techniques for managing varroa populations cannot be practiced. However the hive will also have more bees available for defence, and many standard treatments for varroa also cause damage to the bees.

Flow Hive

The Flow Hive is a proprietary design for a beehive launched in 2015 on Indiegogo. It was based on a design by father and son team of beekeepers and inventors, Stuart and Cedar Anderson from Australia to find a way of extracting honey from comb without the need to open the hive.[29] The system uses food-grade plastic frames which can be split using a special tool and the honey then flows into containers without the need to remove any frames.[30]

Hives optimized for meliponines

Hives have been designed for some meliponines such as *Melipona beecheii*. Examples of such hives are the Nogueira-Neto hive and the UTOB hive.[31]

Hives optimized for bumblebees

Some designs have been optimized for housing bumblebees.

Symbolism

The beehive is a commonly used symbol dating at least to Roman times. In medieval heraldry it was considered a symbol of industry.

In modern times, it is used in Freemasonry. In masonic lectures it is explained as a symbol of industry and co-operation,[32] and as cautioning against intellectual laziness, warning that "he that will so demean himself as not to be endeavoring to add to the common stock of knowledge and understanding, may be deemed a drone in the hive of nature, a useless member of society, and unworthy of our protection as Masons."[33]

The beehive is also used with similar meaning by The Church of Jesus Christ of Latter-day Saints, or Mormons. From Mormon usage it has become one of the State symbols of Utah. (See deseret.)

A doorknob of the Salt Lake Temple of The Church of Jesus Christ of Latter-day Saints bearing an image of a skep beehive

Relocation

A common misconception of non-beekeepers is that smoke will cause bees to move their nest. Smoke is used by beekeepers to hide the alarm pheromone emitted by bees during inspections or harvest. One-way traps can be used to reduce the size of a colony, but is a limited and time-consuming solution. Beekeepers and companies may remove unwanted nests from structures, this process is called a "cut out". Once honey, pollen, and wax are built up in a nest, only physical removal is an option. Some homeowners resort to using spray-foam, but the bees will wait and live off reserves until the foam is weakened, then will burrow through it. An important fact

in understanding a nest is that fewer than 10% of the bees will ever leave at once, other than when swarming. A fertilized queen will lay up to 2000 eggs a day. If bees are killed and the hive products are left, heat and time will loosen the wax and honey causing further problems in the future.

A straw skep engraved on a gravestone

Destruction

By other natural organisms

Black bears destroy hives in their quest for honey and protein rich larvae.[34]

Hives erected by humans, as a defense for their crops against elephants, are sometimes destroyed by elephants. These hives are hung on a single metal wire that encircles the crop field of some farms in African elephant territory. The installation is called a BeeHive Fence and was conceived by Lucy King.[35][36]

By humans

Humans often destroy hives of honey-producing bee species in the interest of obtaining honey and other bee products.

Humans may at times also determine that a beehive must be destroyed in the interest of public safety or in the interest of preventing the spread of bee diseases. The U.S. state of Florida destroyed the hives of Africanized honey bees in 1999.[37] The state of Alaska has issued regulations governing the treatment of diseased beehives via burning followed by burial, fumigation using ethylene oxide or other approved gases, sterilization by treatment with lye, or by scorching.[38] In New Zealand and the United Kingdom, the treatment of hives infected with the disease American foulbrood with antibiotics is prohibited, and beekeepers are required by law to destroy such colonies and hives with fire.[39][40]

Method of destruction

Spraying the hive with a solution of soap and water may be effective, since soap dissolves the bees' waxy exterior that protects them from drowning. However, the procedure should be undertaken with caution, as it angers the bees.[41] In the UK, destruction of a colony with American Foulbrood typically consists of petrol poured into the hive to destroy the adult bees, and then burning the rest of the hive to destroy any remaining bees and bacterium.[40]

See also

- Apidictor
- Honeycomb

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