The life pattern of the Honey Bee

Lancaster Beekeepers advisory leaflet No 10

There is clear evidence that humans have been engaging with honey bees for more than 4000 years. Despite this, bees remain completely wild creatures with a life pattern that has changed little since they first evolved. By understanding this life pattern and making interventions at appropriate times, the Beekeeper can manipulate the bees to achieve a degree of control over them.

The life of a colony of bees revolves around the queen bee. When a new queen hatches her first task is to kill any other hatchling queens in the colony. Having safeguarded her position she then leaves the hive for anywhere up to 10-12 mating flights, during which she will mate with a number of drones (male bees). She will store all the sperm from the drones she has mated with and will not mate again. Returning to the hive she will, within a few days, start laying eggs.

The queen lays both fertilised eggs, which hatch into worker (female) bees and un-fertilised eggs, which hatch into drones. After three days the eggs hatch into grubs. For the next six days the grubs are fed and cleaned by the worker bees. They are then sealed into their cells with a cap of wax. Worker bees hatch 12 days later and drones 15 days later. Queens can live for up to 6-7 years but rarely survive for more than 3 or 4.

Young worker bees spend their first 10-12 days acting as nurse bees, looking after the queen, tending the eggs and grubs and generally keeping the hive clean. Nurse bees fulfil one other essential function, they are able to produce wax which is used to build comb either egg laying purposes or for storing honey. As they grow older they lose this ability.

For the next period of their lives, again 10-12 days, they act as guard bees at the entrance of the hive, receiving nectar and pollen from the foraging bees and storing it within the hive, and defending the hive from marauding wasps, bees from other colonies attempting to steal honey and any other unwanted visitors including beekeepers!
For the final period of their lives the bees act as foragers until they simply wear themselves out. During the summer the typical life span of a worker bee is around 6 weeks, but this is due to physical wear and tear. Bees entering the winter period can live 6-8 months until the season starts again.

Drones have only one purpose and that is to mate with the queen. They play no other role within the life of the colony and each autumn are ejected from the hive and left to die.

If the queen:

- fails to return from a mating flight
- dies
- does not lay at the rate the colony expects her to
- runs out of stored sperm and only lay unfertilised eggs which hatch into drones
- is rejected by the colony for some reason

or the colony is preparing to swarm, they will set about raising a new queen. To do this they select one or more fertilised eggs and build a very greatly enlarged cell, known as a queen cell, around it. When the egg hatches they will feed the grub a special substance known as royal jelly. The cell is sealed on day 9 of the cycle as with all other cells but the new queen emerges only 7 days later and the cycle begins again.

The beekeeper can apply knowledge of this cycle to manipulate the bees.

If, on a routine inspection, eggs are seen, the queen must have been alive within the last three days and functioning properly. This avoids the necessity of finding the queen amongst 40,000 to 60,000 other bees to confirm that she is still there.

If a routine inspection does not reveal any queen cells, then it can be reasonably safely assumed that the bees will not swarm – at least for another seven days!

If, however, one or more queen cells are seen together with eggs, then the colony is about to swarm and anti-swarming precautions need to be taken. This normally involves physically moving the hive from its present location to another, 3-4 feet away.

A new hive is placed on the old site and the existing queen is transferred to the new hive together with her attendant bees, a few stores and possibly some sealed brood. The queen will start to lay again, the bees out foraging will return to the original site and the colony will probably produce a good honey crop.

Meanwhile, at the old hive on a new site, all but one or two of the queen cells are destroyed, and the bees left alone for around three weeks. During this period the new queen will emerge, go on her mating flights and return to lay eggs. There is now a functional new colony which can either be left to develop into a mature colony or re-unite with the original colony. This process is known as artificial swarming.

By understanding the life pattern of the bees and interpreting the information gaining during inspections, a beekeeper should be able to successfully manipulate the colony to ensure that neither bees nor the honey crop are lost.

THE DEVELOPMENT TIME SCALE OF HONEY BEES				
	Queen	**Worker**	**Drone**	**day**
Egg laid				1
				2
				3
Egg hatches				4
				5
				6
				7
				8
				9
Cell sealed				10
				11
				12
				13
				14
				15
Queen emerges				**16**
				17
				18
				19
				20
Workers emerge				**21**
				22
				23
Drones emerge				**24**

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