

Land, water and bees – don't take us for granted: The mysterious case of the disappearing honeybee

Teacher notes

The issue

Honeybees and other pollinators are dying off at unprecedented rates around the world. For some years now bee colonies have been mysteriously 'collapsing', with adult bees abandoning their hive. This 'colony collapse disorder' is the subject of much research and has identified several factors that damage hive health, but no single reason has been found.

Activity

Planning

The information cards from the Student activity sheet will need to be printed or photocopied, ideally onto card, and cut into individual cards. For repeat use they could be laminated. The printing or copying must be double-sided.

Each group will require one of the cards covering one topic so that they can assimilate the facts and present them to the whole class. It might be useful to give several copies of the same card to the group to engage everyone in the task.

The Student activity sheet consists of several cards bearing information about some possible causes for this alarming decline in honeybee numbers. Give one of the cards to each small group of students. Ask them to discuss the details among themselves and then present them to the rest of the class. How long you give the students to prepare will depend on how the data are to be presented. Some possible methods are suggested here, appropriate for different levels of challenge:

- Students may present the details on the card as straight facts or as part of a news report.
- Alternatively, the groups can take it in turns to 'interview the expert'.
- A higher-demand activity turns the classroom into a court, in which pairs of students prepare one of the causes as a statement to present to the whole group. The class could elect a judge to sum up the causes and then a jury from the class could decide on the likely cause, or individuals could vote for a cause based on their opinion of the evidence. It may be worth reminding students that there could be more than one factor at work.

As an extension, ask students to add to the details given in the information cards by carrying out some research online (this provides an opportunity to remind students of the importance of evaluating and citing sources). Challenge each group to provide a wild and wacky fact about honeybees from their research.

Background

There is only one species of UK honeybee, and this pollinator is critical to our agriculture, contributing £400 million to the economy each year. Such is the worry about declining honeybee numbers that the issue is now frequently in the news.

Colony collapse disorder was first recognised in 2006. Bees that appeared to be healthy simply disappeared. Beekeepers did not find the colony dead but found an almost deserted hive containing only the queen bee, the immature bees (known as the brood) and a very few adult bees. There were often good food supplies remaining. The cause has proved very hard to find, despite intensive research that has identified several factors that are demonstrably damaging – there are probably a number of reasons.

This situation has been described as a 'global catastrophe' because the same problem is affecting American hives – the amount of honey produced by California, traditionally a honey-producing state, has halved in 6 years, and nearly one-third of American bee colonies have disappeared in the last 5 years. A solution is urgently needed as large monocultures (with few blossoming plants outside the crop season) and the use of pesticides have reduced natural pollinator numbers to the extent that beehives must be trucked around the USA and hired out to farmers to pollinate crops. For example, 1.5 million hives are moved from all over the USA into California for the spring pollination of almond blossom. The same bees may then be taken to Florida to gather tupelo honey, Maine to pollinate blueberries and Massachusetts to pollinate cranberries. These frequent movements could be a factor in spreading disease through hives all over the country.

Honeybees can be found as wild colonies, but they mostly live in purpose-built hives where they are looked after by beekeepers. As well as their importance as pollinators of human food crops and animal fodder crops, they provide us with honey and wax. The 50 000 bees in a colony can make around 14 kilograms of honey with the help of the beekeeper. The wax can be used for candles, soaps, cosmetics and polishes.

Honeybees have other, more unusual uses, too. In Kenya, they are used to form 'beehive fences' to prevent elephants from raiding precious crops. Beehives are suspended from wires along the borders of areas where there are crops growing. Although bees cannot sting an elephant through its hide, they can sting around the eyes and inside the trunks, so elephants avoid areas in which they can hear bees, and even warn other elephants away. This measure also protects the elephants from the farmers, who might otherwise kill elephants in order to protect their crops. The honey that the bees produce is a bonus for the farmers.

www.zoo.ox.ac.uk/impact/elephants_and_bees