

Bees and Beekeeping in Schools

1 Introduction

CLEAPSS has received a number of enquiries from schools, both primary and secondary, with a view to keeping bees in school. Some of these enquiries result from national publicity about the plight of the honeybee, *Apis mellifera*. Infection with the parasitic mite *Varroa destructor*, and the impact of the not yet understood 'colony collapse disorder', have meant that maintained bee colonies are at great risk, and the honeybee has all but died out in the wild in the UK. Schools see beekeeping as a response to this crisis and to wider environmental issue that concern them, as well as a unique educational experience.

CLEAPSS always tries to encourage schools to undertake activities that give children valuable educational experiences. However, a very rare severe reaction to a bee sting - an anaphylactic shock - can kill, so it is essential that teachers consult, and if necessary modify, a risk assessment before introducing bees into school. There are alternatives to keeping beehives in school, and some of them are listed in this paper.

Before you consider giving your pupils or students experience of bees and beekeeping, you are advised to contact the British Bee Keeping Association (BBKA). Details are given in appendix 1. Other aspects you need to consider include cost and the time involved.

At current prices, we estimate it costs around £200 to set up a single beehive (£100 for the hive and a similar sum for the 'nucleus' of bees), plus further expenses, including bee suits, sugar syrup, medication, hive tools and other resources adding up to a total of £300 to £400. (Allow a further £200 for each additional hive). You will also need a hygienic means of extracting and bottling the honey. Some local associations own and share equipment. You can collect and install a found 'swarm' but you will have no control over the bees' temperament. Buying a nucleus can give you better-tempered bees, although all bees are fiercely protective of honey stocks.

Bees are wild animals, not pets, and their behaviour will always be unpredictable. They need a high degree of skilled attention, year-round, including inspection, management, feeding and medication. The busiest season coincides with school summer holidays. Caring for them is not a casual activity and the constant support of an experienced beekeeper, preferably a staff member, is essential for the welfare of both bees and humans.

The BBKA is the national body for beekeepers. It maintains standards, trains and awards beekeepers, disseminates information and encourages educational initiatives. Local organisations are based in counties and will offer visits to schools and help with setting up school hives. The BBKA and its members are enormously enthusiastic about beekeeping. The BBKA publishes a number of papers concerned with the welfare of bees in schools as well as the safety of children. For more information go to: www.britishbee.org.uk. Full details of the BBKA can be found in appendix 1.

2 Bees in school

Providing pupils with first hand experiences of bees in school is likely to take the form of one of the following scenarios. They range from a visit from a beekeeper to the establishment of temporary or permanent hives and each presents different issues.

An all-year-round alternative to any of these is to plant a bee-friendly garden in your school. Planting a number of familiar wildflowers like borage or comfrey will attract honeybees. Bumblebees are drawn to lupins, lavender, foxgloves and hollyhocks. It is perfectly possible to study the behaviour of bees as they visit your flowers without the need to keep a hive or organise a visit, and with little real risk of a child being stung as long as the bees are left to get on with their work.

2.1 A visit to an apiary or from a beekeeper

Many beekeepers welcome a visit to their apiary by a small group. Protective clothing is available in child sizes, to which must be added wellington boots and thick, close-fitting gloves. Beekeepers inviting an apiary visit, or visiting a school, should be expected to hold an ECRB check in line with the requirements of the Independent Safeguarding Agency.

Some beekeepers are prepared to visit schools. The BBKA offers very clear advice, including safety advice, to a visiting beekeeper. Displays at public events such as a school visit, include hives being opened behind a mesh net. Bees encountering an obstacle naturally fly over it, and the net is meant to guide the bees up and over the audience.

2.2 Keeping a standard beehive for class observation

You might plan to buy or make, and to stock your own hive. To reduce the expense you could try to borrow a hive from a beekeeper. Martin Buckle, a beekeeper with experience of taking bees into his village schools, advises making a written assessment for approval by the school governors. He says:

“Observe live bees without undue risk by watching an intact undisturbed hive from behind a permanently erected netting screen. The bees get accustomed to flying up and over, and children can watch at close quarters without fear of stings. Since the hive will be watched from outside without any disturbance, a beekeeper does not have to be present when children are watching it. The teacher should ask for the hive to be placed so that it is:

- Not directly accessible to children without supervision. Suitable barriers between children and hive could be a boundary fence, screen netting, or a flowerbed.
- With its entrance mostly towards the children, and,
- Close enough for the children behind the screen netting to see individual bees easily.

The netting screen should be about 2m high, dark in colour with holes small enough to deter bees from flying through. Weatherproof netting is available at garden centres or beekeeping suppliers. It is easier to see through if the background behind the hive is dark - such as trees, a tall hedge or a wall. Bees follow ‘flight paths’ and it is important that the children’s observation point is not in one of these.

Another possibility is to have the hive close to the windows of a classroom or a corridor so that observations are made from indoors. In this case it helps to have the hive raised on a garden table or a small stand. Placed like this the hive is also in a good position for children to be shown the interior by the beekeeper.”

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These notes assume that the hives are not likely to be knocked over or interfered with by children. The levels - the brood and supers - of a standard beehive are stacked and held in place by their weight and by a sticky material - propolis - bees use to seal cracks. It would take some force to knock a beehive over; but the roof, a board with a zinc or other lid, can be easily lifted off.

Most school premises are relatively secure but consideration should also be given to the possibility of deliberate interference and vandalism.

2.3 Keeping an observation hive

Standard hives vary but many schools are attracted by a glass-sided observation hive, indoors or outside.

The BBKA recommends that keeping an observation hive in school premises should not be taken on without considerable thought. For the school there can be both significant advantages and disadvantages:

- In having it there all the time, it is available for class use at any time.
- It provides an opportunity to study a macro-society with very different communication mechanisms.
- Respect for, rather than fear of, animals can be engendered.

However against this are factors such as:

- There are a limited number of lessons when the hive will be used.
- The school will have safety problems if they do not have a member of staff who is a beekeeper.
- Children are notorious at fiddling with equipment particularly if they can create a drama.
- What happens during school holidays?

The observation hive needs regular checking to ensure its continued usefulness. After a few weeks the bees often attach beeswax to the viewing glass. Although this can make it more interesting because transverse views through cells enable what goes on in cells to be seen better, it makes it impossible to see the bees on the combs.

If an observation hive is available to the school for short term observations of a few days or weeks, the BBKA recommend the following:

- The siting of the observation hive must be carefully considered.
- The exterior exit hole from the hive must be protected from vandalism and provide a clear flight path for the bees. An upstairs room will provide this.
- The hive must be fixed so it cannot be knocked over.
- The entrance tube to the hive must also be fixed. It is best positioned where both sides can easily be viewed.
- It is advisable to restrict children's access to times when a responsible person is present. Children should be discouraged from tapping the glass.
- Daily observations should be made to check that the bees have enough food and water, that they do not become overcrowded, and that the exit tube does not become blocked.
- The observation hive should be fitted with a means of feeding the colony with concentrated sugar solution. This can be made up by dissolving two pounds of white table sugar in a pint of hot tap water (1.75 Kg in 500 ml) and allowing it to cool.

Bees are very clean animals, incidentally. If debris is noticed building up in the bottom of the hive and no bees are leaving the exit tube outside then a beekeeper should be contacted urgently to clean out the pipe. This is unlikely to take much time but should be carried out with no children around as bees can escape during the process.

If planning to have or use an observation hive you should carefully read the model risk assessment given in appendix 1 (based on an original from the BBKA). It lists the recognised hazards, who might be affected and how to reduce the hazards as far as possible. Teachers should also make any adjustments to meet any particular local circumstances. A customisable copy can be found on the CLEAPSS web site in both the *Primary Resource* and *Secondary Resource*.

3 Bee stings

Despite care, bees may sting. It is important to act quickly and correctly.

The BBKA recommends the following to beekeepers. The general advice applies to others too.

3.1 Getting the sting out

'When a honey bee stings someone, the sting, venom sac and venom pump are left in the skin after the bee pulls away. Most of the venom will be injected in the first 20 seconds but the pump can continue for up to two minutes. **It is important to get the sting out fast to minimize the dose of venom.**

It is generally thought that a bee sting should not be squeezed for fear of forcing more venom into the skin but experiments in America have shown that as long as action is taken quickly there is no difference at all between scraping, tweaking or squeezing. Time can be wasted finding a penknife or scraper, so the best method is to **scratch out the sting with a fingernail or hive tool quickly.**

An ice pack or packet of frozen peas will help to reduce any pain or swelling resulting from the sting. Sometimes a bee will sting through the bee suit or gloves. Then it only takes a moment to shift the clothing and dislodge the sting, smoke the area and remove the sting from the clothing.'

Uncomfortable swelling is normal. It may last for several days. A doctor may advise the use of an antihistamine such as *Piriton*. This should not be administered without professional advice. Antihistamines can cause drowsiness.

3.2 Allergic reactions

About 20% of beekeepers seem to have some allergic reaction to bee stings. This can range from slight swelling in the vicinity of the sting, to a generalised itching (urticaria) or anaphylaxis (generalized shock including difficulty in breathing). This very allergic group needs to be careful when working with bees to ensure that they are not stung or have prepared for an emergency. Unfortunately even beekeepers who normally show little reaction to bee stings may react adversely to further stings so it is always wise to be prepared and ensure that help can be called in any emergency.

3.3 Bee sting anaphylactic shock: what to do

(The following advice is also printed in appendix 3 for easy of copying)

Anaphylactic shock is very rare, but if it does happen, very quick and calm procedure is essential. Anaphylactic shock results from a sudden drop in blood pressure. The observable symptoms include the rapid onset of tingling of the lips, dizziness, nausea, vomiting and collapse. A common remedy among beekeepers is an Epi-pen, delivering a dose of adrenaline but this should NEVER be administered by another person since unnecessary adrenaline can cause death.

The following advice is adapted, with permission, from that issued by the BBKA:

- If anaphylactic shock is suspected get someone to call the first aider and the emergency services immediately. Explain that it's a bee sting reaction. Then:

If the person is conscious

- Loosen tight clothing at the waist and neck.
- Sit her/him on the ground, leaning against a wall, tree or similar.
- Make the person as comfortable as possible to help breathing.
- The person may be short of breath, feeling sick or feeling faint and may be very frightened so stay with the person, talk quietly and encourage her/him to breathe in and out regularly.
- If the casualty is an experienced beekeeper, ask if this reaction is usual and if s/he has any medication provided by her/his GP (i.e. antihistamine tablets). If so let her/him self-medicate.

If the person is or becomes unconscious

- Loosen tight clothing and place the casualty in the recovery position on her/his side.
- Tilt the head back for a good airway.
- Put underneath arm behind the back.
- Check that s/he is breathing and that s/he has a pulse in the side of the neck.
- Do not try to give the casualty any food or drink.
- If the casualty's heart or breathing stops, resuscitation should be provided by a trained first aider.

4 Other Bee Phenomena

4.1 Swarming

Swarms of bees arriving on school premises should be reported to the police, who will contact the local beekeeper responsible for swarm control. They will make every effort to remove the bees quickly and safely. In the meantime, keep everyone clear. Bees are usually benign when swarming but no risks should be taken and thoughtless behaviour like poking the swarm can cause a fierce reaction.

Swarms are only eradicated when it is impossible to remove them safely. Environmental considerations aside, a bee swarm is a valuable asset and beekeepers welcome the chance to use a swarm to start a new hive without cost.

4.2 Bee diseases

Bees are subject to a number of common bee diseases. While these are not transferable to humans, they do demand expert management for the welfare of the bees. Some of them - for example, types of foulbrood - are notifiable and will entail the visit of the local bee inspector. In extreme cases of American Foulbrood, the hives and colony must be destroyed to prevent the spread of the infection.

Appendix 1 School beekeeping

Should you take the decision to keep honeybees in school, it is essential that you follow the steps outlined below before obtaining your bees. Note also the cautions given in the introduction on page 1.

Summary

1. Consult an experienced beekeeper.
2. Make your plans following all the advice in this document and discuss them with other staff.
3. Consult and, where necessary, modify and record a risk assessment, including dealing with anaphylactic shock.
4. Talk to the school neighbours.
5. Join the BBKA.
6. Plan how you will use the honey.

1 Consult an experienced beekeeper

It is important to establish a good relationship with a local beekeeper or beekeeping organisation. You will need their help to set and maintain the hive, and to deal with any problems that arise. Honeybees are subject to a number of diseases (not transferable to humans) which will need treatment, either precautionary or in response to infection. A beekeeper on or related to the school staff is ideal. Non-staff members will need CRB clearance.

2 Make your plans

Identify your individual circumstances. For example, secondary schools may have fewer problems with keeping bees, because hives can be kept in a second storey laboratory or on a roof, than single storey primary schools. The bees' flight path and walkways in the school are at different levels, and there is less likelihood of people on site encountering bees. Hives need regular skilled maintenance, especially through the summer, when the school may be on holiday. Don't forget:

- How many hives will you have, where they will be sited?
- What equipment and clothing you and the children will need?
- How will you fund the project?

Make your hives secure

Ensure the security of your hives from vandals, thieves and the curious. It is not unknown for vandals to kick down hives, and there have even been rare cases of 'bee rustling'!

3 Complete a risk assessment in advance and act on it

It is essential that a full risk assessment is undertaken. Use appendix two as a guide. Although written for the use of observation hives it is appropriate for any hive in a school. In addition you must follow and act upon the guidance below.

Plan for anaphylactic shock

It is impossible to guarantee that no pupil, student, staff member or visitor to a school will ever suffer an anaphylactic shock. It would be impractical to test everyone on the school site for sensitivity but it would be advisable to add a question about it to a school medical record and to alert staff - as schools already do for children with, for example, nut allergies - together with the immediate action to take.

It is essential to continue to monitor anyone showing a reaction to a bee sting, even if the first reaction is quite minor (see also appendix 3).

4 Talk to your neighbours

It is important to consult with neighbours before establishing hives, especially if your school is in an urban area and your neighbours are close. Take a beekeeper's advice on siting your hives with a view to flight paths. For example, hives can be sited facing a tall hedge. This guides the bees up and over, and so very quickly they rise above passers-by. (Honey from urban bees is often of good quality because the bees are unlikely to visit plants subject to chemical crop spraying.)

5 Join the BBKA and learn about beekeeping

Membership of the BBKA is strongly recommended. The BBKA offers support, training and advice. If a member of staff is a member of the BBKA, this nominated individual - but not the school - has public liability insurance for up to £5 million. This insurance will not cover any person under 16.

The British Beekeepers Association, Stoneleigh Park, Kenilworth, Warwickshire, CV8 2LG

Tel 02476 696679, Fax 02476 690682

www.britishbee.org.uk

Despite the strictures above, beekeeping is an enjoyable, rewarding and environmentally friendly activity. Individual beekeepers are generally friendly, helpful, generous and hugely enthusiastic. The BBKA and its branches is an excellent support organisation. Beekeeping is international, crossing all geographical and cultural boundaries. By keeping bees in school, you may be introducing a worthwhile lifelong hobby to your pupils and students.

6 What will you do with the honey?

Plan a use both for the honey you produce and what you will do should you stop beekeeping. You cannot simply bottle and sell honey. It has to be extracted and bottled under hygienic conditions and there are strict regulations about bottling and labelling. If you sell large quantities, you may need to register with the local bee inspector. You are obliged to report some bee diseases, too. You should have no problem finding a beekeeper willing to take your hive, with or without bees, should you stop beekeeping. It will save them a considerable investment.

Educational opportunities

The British Beekeepers Association has developed a schools pack for Key Stages 1 and 2 which is a useful tool in teaching about the plants and animals that surround us, minibeasts, pollination and care for the environment. It is available in two forms - as a conventional ring binder or as a CD. The file has 90 pages with both line drawings and colour photographs. It was revised in 2008. It is full of lesson ideas, and the worksheets - used selectively - are appropriate for the age range. It costs £15 including postage and packing, from the BBKA.

The CD version is structured as a self-contained website - so no Internet connection is needed. It has two sections - the teacher-supporting 'staff room' and the interactive 'class room'. Children can browse this in safety, learning by exploration. This is £10. More about it and order forms for both products are at www.britishbee.org.uk/bees4kids/.

Teaching about pollination, adaptation, and food chains, as well as about responsible management of the environment.

Pollination: apples, raspberries, peas, runner beans and cherries are among the fruit and vegetables dependent upon the honeybee for fertilisation. Crops valued between £120 and £200 million are pollinated by bees each year. The honey trade is worth as much as another £30 million.

Genetics: the honeybee, *Apis mellifera*, was the second organism after human beings to have its complete genome decoded.

CLEAPSS acknowledges with thanks the advice of Chris Deaves, Chair of the Education and Husbandry Committee of the BBKA.

Appendix 2 Risk Assessment for the display of bees in one or more observation, or other, hives

Assessment undertaken by		
Name:		Date of assessment
Hazards	Those at risk	Control measures and further information
Bee stings	everyone	<p>Observation hive securely mounted and stable.</p> <p>Observation hive in good condition and 'bee proof'. Access doors etc. secured against accidental or malicious opening¹.</p> <p>Hive protected from mechanical damage.</p> <p>Person(s) loading hive with bees have appropriately skilled and wearing personal protective equipment.</p> <p>Hive only opened away from people or when public not present.</p> <p>'Gentle' bees used².</p> <p>Experienced beekeeper with protective clothing available throughout the display³.</p> <p>In transit:</p> <p>Hive protected against damage.</p> <p>Hive openings bee proofed.</p> <p>If bees allowed to fly:</p> <p>Warning signs on display advising that honeybees are flying in the area.</p> <p>The end of the flight tube is: away from the public, has a suitable terminal⁴ or target to help the bees return, and is above head height.</p> <p>System in place to prevent bees leaving the hive prior to the end of the event, to avoid leaving bees at the venue and nuisance during and after take-down⁵.</p> <p>Bees to be confined to the hive if weather or other factors make them irritable.</p>
Anaphylactic shock following bee sting	everyone	<p>Demonstrators, etc, aware of risk.</p> <p>Emergency procedure to be on display to include:</p> <ul style="list-style-type: none"> • Guide on symptoms. • First aid. • Precise location and access information to be available for relay to emergency services to facilitate rapid access. <p>Mobile phone or other communications to be available to call Ambulance Service via 999 service if needed.</p> <p>If participating in organised event, knowledge of and compliance with the organisers' procedure for contacting emergency services.</p>

¹ It is recommended that the hive should be secured so that a tool of some kind is needed to release the access - e.g. a screwdriver, Allen key or spanner. If a simple turnbuckle or similar catch is relied on then the hive could be opened accidentally or maliciously.

² Gentle bees can be obtained by moving the source hive from its original stand by a few metres and putting a brood box in its place. Quite quickly the older, flying bees will have left the source hive, which will now be populated only by nurse bees, etc. Where possible, a gentle strain of bees should be used.

³ Consideration should be given to having shutters, a suitably sized board or cloth available, to cover the hive in the event of the glass being broken.

⁴ If the end of the flight tube does not have some kind of target, the bees may well have difficulty locating it and returning to it. A funnel or a plastic cup fitted over the end may be sufficient for them to get their bearings.

⁵ Ideally, either disassemble the hive in the evening when the bees have stopped flying or introduce some kind of bee escape in the flight tube, to prevent bees exiting, an hour or so before takedown, if possible.

Appendix 3 Anaphylactic shock

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If the person is conscious

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- Sit her/him on the ground, leaning against a wall, tree or similar.
- Make the person as comfortable as possible to help breathing.
- The person may be short of breath, feeling sick or feeling faint and may be very frightened so stay with the person, talk quietly and encourage her/him to breathe in and out regularly.
- If the casualty is an experienced beekeeper, ask if this reaction is usual and if s/he has any medication provided by her/his GP (i.e. antihistamine tablets). If so let her/him self-medicate.

If the person is or becomes unconscious

- Loosen tight clothing and place the casualty in the recovery position on her/his side.
- Tilt the head back for a good airway.
- Put underneath arm behind the back.
- Check that s/he is breathing and that s/he has a pulse in the side of the neck.
- Do not try to give the person stung any food or drink.
- If the person's heart stops or the breathing stops, resuscitation should be provided by a trained person.