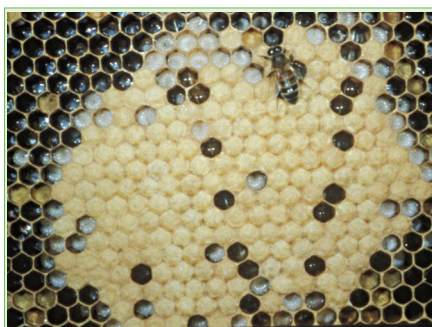


Disease Recognition

This best practice guide from the NBU is designed to help you identify both normal and abnormal brood during your regular hive inspections. Do remember to seek advice from an experienced beekeeper if you have any doubts about the health of your colony.

There are four distinct disease categories which may affect your bees:

- ❑ Varroosis — the effects of varroa.
- ❑ Brood diseases, which are evidenced by the appearance of the brood.
- ❑ Adult bee diseases, which are usually identified by behavioural indications.
- ❑ Viruses, which are difficult to identify but are usually associated with one or more of the other diseases.



Above: Normal, healthy brood including eggs, uncapped C-shaped pearly-white larvae and healthy, biscuit-coloured domed-capped brood laid in a regular, even pattern.

Learn to recognise what is normal and how normal bees behave — anything which is not normal should be investigated straight away. Refer to Fera's National Bee Unit brochure *Foul Brood Disease of Honey Bees* (this is available for downloading at www.nationalbeeunit.com).

Varroosis

- ❑ Varroosis (the effects of varroa infestation) can have varied signs and symptoms. Bees may have stunted abdomens or deformed wings. There may be dead imago (adult) bees, often with the proboscis extended, on the point of emergence from cells. There may be rotting pupal remains in cells (similar in some cases to EFB).



Above: A bee with deformed wings, surrounded by varroa.

Brood diseases

- ❑ It is important to be able to see the brood in order to inspect it properly.



Above: The notifiable brood diseases, EFB and AFB. Top panel shows EFB infected comb, middle panel shows AFB infected comb and bottom panel shows the AFB rope test. Signs of both AFB and AFB may be sunken, concave or discoloured cappings; in EFB uncapped larvae may be lying in abnormal positions and AFB may result in perforated cappings.

Either move the bees by brushing gently with your hand or a goose wing, or shake them off the comb.

- ❑ Normal, healthy sealed brood has even, domed, biscuit coloured cappings with few holes in the pattern; healthy open brood has pearly white 'C' shaped larvae with clearly identifiable segmentation.
- ❑ Sunken, concave or discoloured cappings are a sign of American foul brood disease (AFB; photo opposite).
- ❑ Small perforations in cappings can be a sign of American foul brood disease. They can also indicate other diseases such as Sacbrood (a viral infection) or Chalk brood (a fungal infection).
- ❑ Larvae which are uncapped, discoloured (yellowish brown) and are lying in abnormal positions can be a sign of European foul brood (EFB; photo opposite) but may also result from Sacbrood or varroa infestation.
- ❑ Both European and American foul brood diseases are notifiable. This means that you must not move anything from the site. You should restrict the hive entrance to reduce the risk of robbing, clean your hive tool etc and



Above: Chalk brood, caused by a fungus. Signs to look for include (top panel) pearly white uncapped larvae, which appear to be lying in line with the cell and have a pointed appearance, hard white, grey or black pellets in cells and Chalk brood 'mummies' on the hive floor (bottom panel).



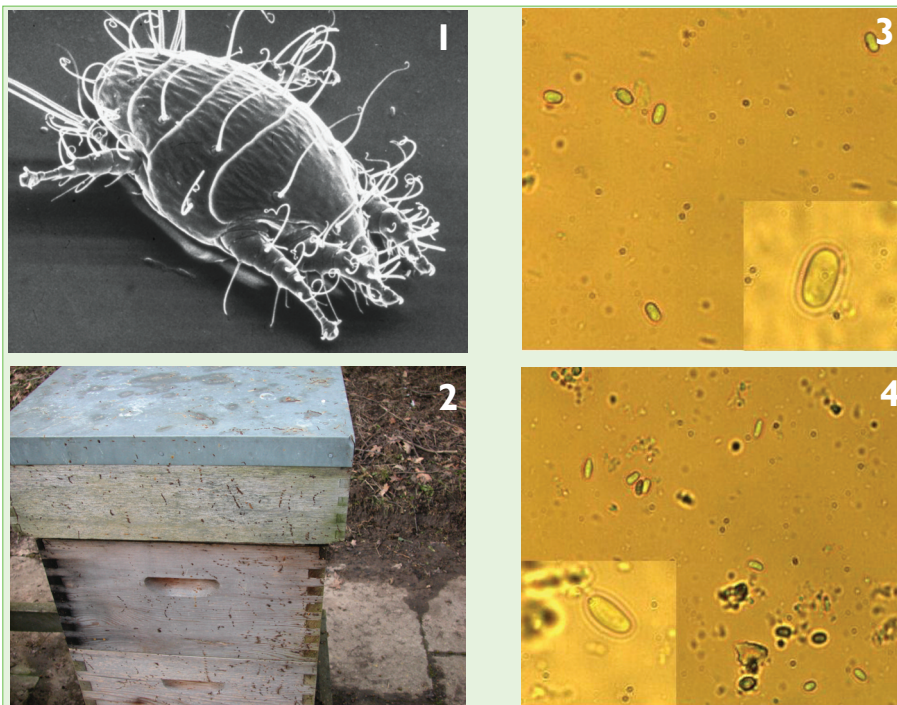
Above: Signs of Sacbrood, caused by a viral infection. Features to look for can have some similarities with early stage Chalk brood and include uncapped, pearly white cells that appear to be lying in line with the cell and may have a pointed appearance (right and middle panels). Cells may also show perforations. Right and left panels show side views of larvae with Sacbrood, which may have a 'Chinese slipper' appearance (right panel).

bee clothing, and then immediately notify your Appointed Bee Inspector:

- ❑ Uncapped larvae which, although pearly white appear to be lying in line with the cell and have a pointed appearance, can be a sign of early stages of either Chalk brood or Sacbrood.
- ❑ Hard white, black or greyish 'pellets' in cells may indicate Chalk brood.
- ❑ Uncapped cells with normal developing pupae exposed is a sign of Bald brood. This condition results from bees uncapping cells in which they apparently sense something is amiss; often the cause is wax moth larvae tunnelling under the cappings. This can sometimes show as a whitish line under the cappings.

Adult bee diseases

- ❑ Colonies which do not develop normally in the spring could be suffering from either nosemosis or acaraposis.
- ❑ Signs of dysentery (faecal staining) on frame tops or faces or on the outside of the hive may also indicate nosemosis.



Above: 1: Acarine mite, responsible for acaraposis. 2: A fecal-stained hive; a sign of dysentery. 3: Nosema apis and 4: Nosema ceranae, both viewed under a high power light microscope.



Above. 1-3: Wax moth infestation can be seen on the outside of the hive and causing devastation on hive combs. 4: Baldbrood. Here, cells with apparently normal pupae have been exposed by the colony bees. Although the reasons for uncapping may not be obvious to the beekeeper this will have happened because the bees have sensed that something is amiss. Sometimes this is caused by wax moth larvae tunnelling under the cappings, which may be seen as a whitish line.

- ❑ Identification of acarine requires a hand lens or low power microscope; identification of nosema can only be achieved using a higher power (x400) microscope.

Viruses

- ❑ Deformed wing virus is associated with varroa infestation and is characterised by bees having shrivelled or deformed wings.
- ❑ Paralysis viruses are characterised by large numbers of stationary bees with a shiny-black, hairless appearance, apparently 'shivering'.
- ❑ Other viruses may occur, signs are not readily observed and laboratory analysis is the only method of making a positive identification.

National Bee Unit, Best Practice Guide

All photographs are courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; images supplied by the National Bee Unit at Fera.