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Adult Bee Disease Inspections

Bristol Beekeepers

Introduction. There are a host of diseases, conditions, viruses and pests which affect honey bees *Apis mellifera spp*. Maintaining strong colonies, as free from these as possible (and minimising swarming) will, naturally, yield the maximum crop and should be the main aim of any beekeeper. Here we shall be focusing on the diseases which affect adult bees. For information, a graphic is included as an Annex, that lists the diseases, conditions and viruses of both adult bees and their brood.

Adult Bee Diseases. There are 3 adult bee diseases:

(i) Nosema *Nosema cerena* and *Nosema apis*. These are caused by a pathogen referred to as a microsporidian. This infects the gut of an adult bee where it injects its spores into the gut, affecting the ability of the bee to digest pollen. It is spread around the hive by the house bees and can result in shortened life-spans, spoiling of the comb and the inability of a colony to build up during the spring[1].

(ii) Acarine *Acarapis woodi.* This is a mite that enters the first spiracle (breathing tube) of a young bee and then lays eggs in its 1st thoracic trachea. This causes an infection, but there are no outward signs on the bee; the main effect is to shorten its life. It should be noted that use of miticides to treat varroa has significantly reduced the occurrence of acarine.

(iii) Amoeba *Malpighamoeba mellificae*. This is a small cell that is passed around the colony, much the same was as nosema. It lives in the bee's malpighian tubules (the bee's "kidneys") and results in a shortened life. It is very rare.

Adult Bee Disease Identification[2]. Although these diseases can effect a colony at any time of the year, they are most prevalent when there is a large amount of brood and shortage of income (i.e. the spring). In addition, to ensure successful overwintering, it is imperative to check for them during

[1] *Healthy Bees are Happy Bees*, Pam Gregory, Bee Craft Ltd, 2013.

[2] *Practical Microscopy for Beekeepers*, Bob Maurer, Bee Craft Ltd, 2012.

the autumn too. All inspections require a sample of 30 bees from each colony to be taken. These should be old bees, i.e. the foragers, which are placed in a sample bag containing ethyl acetate.

Acarine Dissection. First the bees are examined, using a dissecting microscope, for acarine. Infection will be readily apparent as a discoloured trachea - a healthy bee will have a creamy white trachea.

Nosema and Amoeba Analysis. After the acarine dissection is complete, the abdomens of each bee from the sample is removed and crushed and a tiny amount of clean water added. One drop of the paste is placed on a slide, followed by a coverslip, for analysis at 400x using a compound microscope. Under the microscope, nosema spores will be apparent as rice shaped cells, whilst amoeba are small round cells.

Adult Bee Disease Treatment. Like all treatments for bees, there has been a significant change in licensed products over the past few years. Below is the current recommended treatments for the diseases:

Acarine. There are currently no approved products for the treatment of acarine[3]; Folbex used to be used, but is no longer permitted. Instead, the NBU recommends using a shook swarm, the idea being that following a shook swarm there will be no new young bees for the mites to infect. Consequently, any lingering mites will die. However, it should be re-iterated that acarine is currently rather rare due to the use of miticides to treat varroa.

Nosema and Malpihamoeba. Again, like acarine, there are currently no approved products for the treatment of either nosema or (the rare) malpighamoeba; Fumidil B used to be used, but is not anymore. The NBU's recommendation[4] is to maintain strong colonies in good health by applying good husbandry practices that ensure well fed and disease tolerant colonies, headed by young and prolific queens. Beekeepers should also consider re-queening susceptible colonies with queens from more tolerant stocks of bees which are better able to cope with Nosema infection. In addition, regular comb change can assist in minimising any nosema spore loadings.

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[3] *Acarine (Tracheal Mites)*, National Bee Unit, Mar 17.

[4] *Common Pests, Diseases and Disorders of the Adult Honey Bee*, National Bee Unit, Jun 17.