



National Bee Unit

Estimating *Varroa* mite populations

February 2022

Varroa infestations are often missed by beekeepers until the infestation becomes severe. You should monitor for Varroa at least four times each season: early spring, after the spring honey flow, at the time of honey harvest and late autumn. Knowing how many mites are present in a colony is vital so that you know when to take appropriate action.

This sheet considers three methods commonly used to calculate Varroa populations. Two give a moderately accurate assessment, and the third is a quick guide. You must remember that the 'quick guide' is not an accurate assessment.

Natural Mite Drop

The system is accurate in the winter and summer but during March, April, September and October the results are less accurate. No treatment or control should be carried out while monitoring Varroa population levels.

1. Using an open mesh floor (OMF), coat your monitoring insert with vegetable oil or Vaseline so that the falling mites cannot return to the colony stay stuck to the insert and don't get blown away when you pull the tray out.
2. During summer collect debris for at least 7 days.
3. During winter collect debris for a longer period.
4. Count the total number of mites collected and divide this figure by the number of days the sample was taken over and you have a daily mite fall figure. Once the mite drop count has been done, you can complete the process by using the free and easy to use Varroa calculator on BeeBase – just click the link at the bottom of this page. A less accurate calculation can be made using this following step:
5. Multiply the daily mite fall figure by one of the following (as this accounts for the amount of possible sealed brood in the hive and therefore how many mites are on the adult bees.): -
 - Winter i.e. November to February x400
 - Summer i.e. May to August x30
 - March, April, September and October x100 (These periods are approximate only)

NB It is easier to look at hive debris daily and count the mites, which are usually clearly visible. Make a note of the number and clean the insert before replacing it under the floor. Take an average over 7 days.

Drone Brood Uncapping

1. Select an area of sealed drone brood at an advanced stage, i.e. purple eyed stage.
2. Insert a honey uncapping fork under the cappings and lift out the pupae. You may find that twisting the fork will ease the removal of the cappings.
3. Mites present will be clearly visible on the pupae. Count the number of pupae with mites on (a), and the number of pupae sampled (b).
4. Calculate the number of sealed drone cells present in the colony. If you are using the calculator on BeeBase, you only need an estimation of drone brood present, for example 2.5% (Low), 5% (Medium) or 10% (High). You can access the free and easy to use Varroa calculator on BeeBase to complete this calculation – just click the link at the bottom of this page. Alternatively, a calculation can be made by using the following steps:
5. Divide the number of infested drone pupae by the number of drone pupae sampled. That is (a) divided by (b).
6. Multiply the result by the number of sealed drone cells in the colony and multiply that figure by ten to give the mite population in all the brood.

N.B. Using this method, where possible aim for as close to 100 drone pupae as possible, as accuracy is increased with a larger sample.

Quick Guide

Fork out a sample of drone pupae as in method 2. If 1 in 50 pupae have mites on them then the infestation is light and will probably need no control, if 1 in 20 pupae have mites on them, then it is medium, if 1 in 10, then it is heavy. If 15% of drone brood is infested, then it indicates that the colony may be at risk of collapse.

If you have a lot of hives check a representative sample. Strong colonies and those with high yields often have high infestations.

Other methods

Adult bee sampling is also used to assess Varroa mite populations. This can be very precise but requires an accurate assessment of the total population of bees in a colony. As a result, it has not been included on this sheet.

The National Bee Unit Varroa Calculator

As well as being a source of much more information on managing Varroa in your hives, BeeBase has a free and easy to use Varroa calculator which you can access by clicking this link <https://nationalbeeunit.com/public/BeeDiseases/varroaCalculator.cfm>

National Bee Unit

APHA, Room 11G03, York Biotech Campus,

Sand Hutton, York YO41 1LZ

Telephone: 03003030094 email: nbu@apha.gov.uk

Web site: www.nationalbeeunit.com

February 2022

© Crown copyright 2022

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v.3. To view this licence visit www.nationalarchives.gov.uk/doc/open-government-licence/version/3/ or email PSI@nationalarchives.gsi.gov.uk