



primefacts

FOR PROFITABLE, ADAPTIVE AND SUSTAINABLE PRIMARY INDUSTRIES

APRIL 2010

PRIMEFACT 998 (REPLACES AGNOTE DAI-121 WINTERING BEES)

Wintering bees

Doug Somerville

Technical Specialist Bees, Agricultural Production and Industry Development, Goulburn

Introduction

On average, 20% of unmanaged bee colonies may die during winter. In managed hives this figure can vary from around 5% to 100%, depending on the measures taken in autumn to prepare for winter.

The prime consideration for over-wintering bees is to keep them alive and in reasonable condition to come into the spring. If they survive into spring, their numerical strength and disease status will largely depend on what management practices were adopted in autumn, not what is done in winter. In fact, as little as possible should be done during winter as manipulation during this time may undo all precautions taken in previous months. An exception to this is if your hives are on a winter honey flow.

Points to be considered are:

- queens,
- honey in the hive,
- numerical strength,
- disease status,
- location and site of apiary,
- ventilation,
- hive entrance,
- supplementary feeding.

Pre-winter inspection

The final inspection before the onset of winter should take place in April or the beginning of May at the latest.

Pick a sunny day on the warmer side, and remove the lid and any supers. In doing so, estimate the amount of honey stored. Thoroughly inspect the

brood for disease symptoms and, at the same time, check the status of the colony and queen:

Is there a drone layer?

Is it a weak colony or is the queen failing, or is it a colony with a good population headed by a young queen?

Queens and numerical strength

These factors are of prime importance. If the queen is failing, or has become a drone layer, or the colony is queenless, then forget about over-wintering that hive. Kill the queen and join with another colony, placing a piece of newspaper between them. If the queen cannot be located, then let the colony die out. Joining it onto a queen-right colony may lead to that colony's downfall as well.

If the colony has insufficient bees (less than six frames of bees) to maintain a cluster and thus preserve the temperature in the hive, it may easily succumb to cold weather and die. It is important that nucleus hives made up after Christmas are sufficiently strong. This can be achieved either by joining with another colony (one queen must go) or by transferring a frame or two of brood with bees (no queen) into the weaker colony without seriously debilitating the hive from which the brood is removed.

This practice is to be avoided in the late autumn as excess manipulation will put the bees under undue stress. If the colony hasn't built up by late March, then something is amiss with the queen or colony – due to either low fertility or disease, or lack of pollen and nectar.

Disease status

Four brood diseases may be encountered:

- European foulbrood
- American foulbrood
- sacbrood
- chalkbrood.

If anything is amiss in the hive, or you are unsure of what to look for, then contact or send a sample of brood or a microscopic slide (smear) with some of the suspect material on it to the NSW DPI veterinary laboratory (the address is at the end of this Primefact).

A colony confirmed to have American foulbrood (AFB) must be destroyed after contacting your nearest apiary inspector. If a colony has a trace of European foulbrood (EFB), treatment with antibiotics is recommended.

Medication may not work satisfactorily in a colony which is heavily infected.

On the other hand, sacbrood is only a minor disease. Serious cases are uncommon but at times sacbrood can be confused with AFB and EFB.

Chalkbrood reduces production by killing some of the developing brood. Treatment with medications is not possible.

Nosema, a disease of adult bees, is particularly significant in an over-wintering situation. Nosema is associated with stress through nutrition deficiencies and manipulation. Management techniques rather than medication are used to control this disease. These techniques are more or less similar to those practices used for over-wintering bees.

When the brood nest has been examined, close the hive up. Note the reserves of honey the colony has for winter.

Stores

More colonies die from starvation than from any other cause during winter. In determining how much honey to leave on a hive we must also assess how much there is. Colonies should be reduced to doubles (two boxes) and, if strong in numbers, should have one box nearly full of honey. If the colony is on the weaker side, it is desirable to over-winter the colony in a brood box as a single deck hive. The colony should have three or four frames full of honey.

If you are unsure it is always better to leave too much honey rather than too little. Avoid feeding liquid honey back to bees, due to the possibility it is carrying bee disease organisms.

The alternative is to feed sugar in syrup form. If this method is selected, it is better to feed in bulk before winter than to feed in small lots through winter. Use white table sugar. Brown, raw or any other sugars are not suitable and will lead to digestive problems if fed to bees.

A ration of 2:1 sugar:water is usually recommended for winter stores. Up to 10 kg of sugar may be fed to each hive as small amounts tend to stimulate the colony, a situation to avoid at this time of the year.

When determining how much sugar to feed, as a guide 2.5 kg of sugar is equal to one frame of honey.

Three examples of feeders are:

- A bag under the lid. A bladder from a wine cask will hold a few litres – a few holes in the belly will allow the bees to suck the nectar out. Remove the tap and wash the bladder out thoroughly before use – alcohol can kill bees!
- An inverted tin can, for example a milk powder can, will hold three or four litres. Perforate the lid with a few nail holes and invert over the frames in the hive to allow the bees to remove the syrup.
- An empty super placed on the top of the colony with up to four ice-cream containers with a piece of hessian draped into the containers and a piece of polystyrene in each container. This prevents the bees from drowning. Up to 16 L of syrup can be fed in this way.

Take care not to leave fermented sugar syrup in the feeders. If bees haven't consumed the syrup within 3 days, discard the syrup.

During the winter period, dry sugar feeding has been used with some success. Place white table sugar on the inner mat under the lid.

Location and site of the apiary

The siting of an apiary, important at any time of year, is of particular concern during cooler months. Wind can devastate honey bee populations in the winter. Wind whistling through the hive will place the hive under a lot of stress, causing the colony to consume its stored honey very quickly and increasing the level of disease, particularly nosema.

Locate your hives in a dry sunny area, preferably with a north-east aspect and protected from prevailing winds. This will ensure the maximum number of cleansing flights, which will help to keep nosema at a low level. Bees confined for a long time foul their hive, leading to high levels of nosema. Hives located on the Tablelands and Slopes are best placed out of foraging range from winter flowering flora so that they become broodless.

Hives in coastal areas are more inclined to rear brood through the winter. These warmer areas encourage bees to forage all winter, thus requiring a higher level of management. A close check should be kept of stored pollen, nosema levels, and the amount of brood.

Livestock should also be considered when selecting a site. Cattle have a habit of using hives as a convenient rubbing post, usually pushing the hives over.

Other factors to consider

- It is often an advantage to reduce the entrance to 50–75 mm. This will allow weaker colonies to guard their entrance more effectively.
- Winter months are often wet and vehicle access to the site can be a problem. Take this into consideration when choosing a position to over-winter bees.
- Remember that the best time for over-wintering preparation is autumn. Confine your bee-related winter activities to your garage or workshop, preparing and repairing equipment for the coming spring.
- If you wish to check on the progress of colonies during winter, choose a warm sunny day. You should visit your hives once a month and lift them up by the back hand hole to check their weight. Remember, when bees start to increase the brood area towards the end of winter, starvation is the greatest problem.

Bee disease diagnostic laboratory

Officer in Charge

Regional Veterinary Laboratory

Elizabeth Macarthur Agricultural Institute

PMB 8, Camden NSW 2570

Phone (02) 4640 6327

Fax (02) 4640 6400

Email: menangle.rvl@dpi.nsw.gov.au

© State of New South Wales through Department of Industry and Investment (Industry & Investment NSW) 2010. You may copy, distribute and otherwise freely deal with this publication for any purpose, provided that you attribute Industry & Investment NSW as the owner.

ISSN 1832-6668

Replaces Agnote DAI-121 Wintering bees

Check for updates of this Primefact at:

www.dpi.nsw.gov.au/primefacts

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (April 2010). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Industry & Investment NSW or the user's independent adviser.

Job number 9891 PUB10/23