

# American Foulbrood (AFB): Our Bees Are Dying

**American Foulbrood (AFB) disease has received extensive coverage in the media of late, but in case you have not watched any television or read the newspapers lately, please pay attention, as your food security and jobs in your community are under serious threat!**

Text & photos supplied by Helena van der Westhuizen

**A**merican Foulbrood (AFB) disease is the worst bee disease in the world. It is caused by a bacteria which infects bee larvae as they are fed, resulting in their death as pupae and the release of billions of infectious bacterial spores into the environment. It does not affect humans or adult bees, but the brood collapse results in the eventual death of the colony.

AFB was first diagnosed in the Western Cape in 2009. Now, five years later, after hoping that our bees would once again be able to cope with this new obstacle, it has been found to be out of control, spreading fast and a huge concern to the health of our bees and beekeeping in the Western Cape. AFB has no respect for boundaries and it won't go away. It will affect you sooner or later. Probably sooner!

The Western Cape Bee Industry Association, together with the Department of Fauna & Flora (DAFF), SABIO and experienced specialists, have put together an extensive guide as to how to recognize and to manage AFB. These guidelines are for small beekeepers (even if you have just one hive) or commercial beekeepers, as well as hobbyists, so pay close attention, this might save your bees!

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*Due to its importance, these guidelines are reproduced here in their entirety as issued by the Western Cape Bee Industry Association.*



## **A GUIDE FOR BEEKEEPERS: HOW TO MANAGE AFB**

### **BACKGROUND**

American Foulbrood (AFB) disease is the worst bee disease in the world. It is caused by a bacteria which infects bee larvae as they are fed, resulting in their death as pupae and the release of billions of infectious bacterial spores into the environment. It does not affect humans or adult bees, but the brood collapse results in the eventual death of the colony.

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### **THE PRINCIPLES OF MANAGEMENT**

We now urgently and seriously need to, individually and collectively, meticulously manage our bees to affect the proper control of this very real threat to our livelihood. The success of our efforts rests on the following 5 important pillars:

- a. Know that you are facing a real threat and that YOU have to take on the responsibility to act;
- b. Familiarise yourself with AFB and how to identify it;
- c. Inspect often, correctly and thoroughly;
- d. Immediately deal with any infected colony & equipment and
- e. Limit the spread by all possible appropriate measures.

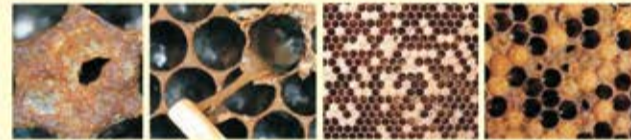
#### **A. Take on the Responsibility!**

1. The time has come to face the truth – Bee-keeping will not be Bee-having anymore. It will henceforth require your full attention and decisive action.
2. Know that all roleplayers in the Bee Industry and other honeybee-dependent Agricultural Industries expect you (whether a hobbyist or commercial beekeeper) to play your part properly.
3. And if you can't, be decent, honest and bold enough to give up beekeeping – in an appropriate way, of course.
4. If you are unsure, seek guidance from other knowledgeable beekeepers and/or your local Bee Industry association.

#### **B. Know the Enemy**

On every frame containing brood, look for one or more of the following signs:

1. Colour of Cappings – Even on the same frame healthy cappings are raised and range from light to dark brown, while infected cell cappings are darker in colour, eventually turning black.
2. Appearance of Cappings – Because of gas formation by dying pupae, most infected cells have irregular holes in them, and are sunken.
3. Spotty Brood Pattern – Infected larvae fail to emerge, resulting sometimes in a 'spotty pattern'.
4. Colour of Brood – Healthy larva and pupae are white. When infected, it changes to brown.
5. Smell – Infected brood can exhibit a foul smell, but not to be relied on for detection.
6. Ropiness – Infected brood display a characteristic ropiness when a small stick is used to slightly stir the diseased matter.



#### **C. Inspect, Inspect, INSPECT !**

The only way to identify AFB is to do a thorough visual inspection of every frame containing brood, in every hive, in every apiary as follows:

1. at least 3-4 times per year;
2. before cropping honey;
3. before moving into pollination;
4. and more often when AFB has previously been found in the apiary.

#### **D. Deal with it Immediately & Decisively !**

Once AFB has been visually diagnosed, it is too late – the colony will not recover and it is only a matter of time before full collapse. The responsibility lies with you to take immediate action. Failure to do this will result in the colony dying, whereafter the hive will be robbed out by surrounding colonies, resulting in the rapid spread of the spores and disease to these colonies.



And as this disease is with us now, it means that you have to have the following additional equipment on your vehicle at all times:

- Materials to close hives properly (cotton, sponges, industrial cling wrap, plastic bags)
- Disinfectant like Domestos or Bleach & Water for making a solution according to the label instructions to clean hands/gloves
- Fire control equipment and sufficient water
- Log sheet for record-keeping
- Clean, sealable container for all scrapings of propolis, wax, etc.

**When you visibly find AFB in a hive, this procedure must be followed:**

1. Mark the hive clearly.
2. Before working another hive, clean your contaminated hive tool by scraping off all propolis, wax, etc into the infected hive or dedicated container and then sterilizing it. The latter can be done by either sticking it in the smoker (pumping it a few times to create sufficient heat) or using a mini blowtorch --- observing safety of course, OR by washing it, as your gloves/hands, in the disinfectant solution.
3. Return to the marked hive ASAP at dark or a time of low foraging activity, and close the entrance and all holes thoroughly. (The bees can at this point be killed according to 6b hereunder if there is no honey to be harvested in the super, if present.)
4. Remove the closed hive to a predetermined place where it can be processed further.
5. Such a place should have the following properties:
  - a. A bee tight room with appropriate equipment and tools.
  - b. Sizable enough to store and work with the infected items in isolation.
  - c. Safe burning facility to incinerate any component or product properly.
6. At this site, proceed as follows:
  - a. If there is sufficient honey, mark the super and frames and extract normally, keeping the infected super and frames together and isolated from robbing bees for later sterilisation. Proceed to c.
  - b. Either kill the bees in the brood box by tilting the hive slightly

backwards and pouring a cup of petrol (observing safety !) onto the floor board and closing the hive immediately for about a minute before progressing further, OR proceed with the shook swarm method described later.

- c. All comb can be cut out and rendered into wax blocks for normal further processing. The remains of this process must be burnt.
  - d. Hive components must either be burnt, or sterilized by one of the following methods:
    - i. Boiled for 10 minutes in paraffin wax heated to 160°C (be careful !) or
    - ii. Irradiated at a suitable facility (contact HEPRO, Cape Town @ 021-5558880).
  - e. All left-overs like broken components, debris, closing/wrapping material, propolis, etc must be burnt immediately.
  - f. Sterilise all cleaned contaminated plastic frames, tools, equipment, containers, etc you have used by soaking in the disinfectant solution for at least 5 minutes.
  - g. Properly wash your vehicle/trailer at least daily.
7. Lastly, notify DAFF of any new finding of AFB. By law you are required to do this. Contact Riaan van Zyl on 0834142494 or [riaanz@nda.agric.za](mailto:riaanz@nda.agric.za).

#### **E. Limit the Spread of AFB Spores**

1. Beekeeper Behaviour
  - a. AFB is more a Beekeeper's disease than a honeybee one ! Take care in whatever you do, be attentive, work clean, be organised and prepared, and ensure that your personnel are informed and do so as well. Plan & prepare in advance to do things timeously.
  - b. Get rid of (appropriately) your old and leaking hives and weak non-vibrant colonies and ensure you have movable frames in good condition to facilitate regular inspections.
  - c. Very Important: Never ever let any hive die out because of AFB --- act before it does !
  - d. Be part of your local beekeeping association to stay on top of developments, to share your experiences and to learn how to live with AFB.



## 2. Wet Honey Supers (and wet containers / equipment)

Wet supers from clinically AFB infected hives will carry spores and infect the next colony they are used on. They must be dealt with according to 6a above.

Wet supers from hives which were inspected to confirm that they are without clinical symptoms of AFB, can be treated in either of the following ways:

- a. Use the barrier method. If you can manage it properly, number each frame, super, brood box and other components of the same hive with the same number and do not interchange with other hives. Additionally work through your bees per site or area at a time.
- b. Establish a dedicated cleaning ("canary") apiary (preferably close to your extracting facility) and deal with your wet supers as follows:
  - i. Stack them up to 4 high on the active healthy hives (using a queen excluder for separation) in this apiary to be cleaned by the bees within a day or two.
  - ii. Unless this apiary is far outside an urban area and not within flying distance of 2-4 km from any other apiary (other beekeepers' included!), it is not advised to stack them outside to allow the bees from this apiary to rob them clean for a bee-working day or two.
  - iii. Inspect and manage this "canary" apiary regularly (at least monthly) for AFB!

## 3. Exchanging Brood Frames Between Hives

This is not recommended as it is a guaranteed way of transferring spores. (Only to be considered if the donor colony is found to be free of AFB after thorough inspection.)

## 4. Catching Boxes

As old combs is a very probable vehicle of AFB spores, rather prepare your catch boxes as follows:

- a. Use all sterilised or new components.
- b. Use foundation starter strips, as the trek swarms will use up most of their stores drawing the foundation, before the queen has a chance to lay eggs.
- c. Use an old hive which was properly cleaned with a gas flame to lure a new swarm.
- d. Check the new swarm for AFB before rehiving.

## 5. Robbing

- a. Strong colonies are likely to rob honey from weak (infected) ones. Keep them in separate distant apiaries whenever possible. Check your strong colonies just as regular as your weaker ones!
- b. Prevent robbing in all possible ways in apiaries, from your vehicle and your working facilities.

## 6. Drift

Although this is not considered to be a major means of spreading spores, care should still be taken to reduce it, by irregular layouts of hives in an apiary, spacing the hives at least 3 m apart and/or facing them in different directions.

## 7. Trek Swarms

Do not use old combs in the hive into which you transfer a caught swarm --- rather use new wax foundation strips and/or sheets.

## 8. Feeding Honey to your Bees

This is not recommended as it is a definite way of transferring spores.

## ADDITIONAL INFORMATION

1. Honey harvested from AFB positive hives is safe for human consumption but is a high risk for robbing / cleaning bee colonies in the near vicinity.
2. Bee Removals. Work very carefully & neatly. Check the brood for AFB and report to DAFF if AFB positive --- this is very important! Make sure that all holes and points of entry to the cavity are sealed properly and permanently after the removal. Treat the combs as in D. above if they show AFB symptoms.
3. The Shook Swarm Method. One shakes all the bees from the infected hive into an empty clean suitable container / cage, where they are kept for 3 days to consume any stores in their stomachs. Thereafter the bees are hived into sterilised equipment and fed appropriately.
4. Antibiotics have been used for many years in other countries for treating the symptoms of AFB. The AFB in these countries now shows signs of resistance to this treatment. It is illegal in South Africa to treat bees for AFB with an antibiotic or any other chemical. These chemicals do not cure AFB anyway --- they just temporarily mask the symptoms. There is also the risk of it contaminating your honey.





5. The Pollination Standards of WCBA prohibits the use of hives with visible symptoms of AFB for pollination.

6. Do not be fooled by the apparent "healthiness" of your strong colonies. It is exactly them which are the likely robbers of the diseased weaker colonies or dead-outs --- inspect them as regular as all your other bees.

#### SA LEGISLATION REGARDING BEEKEEPING

According to the Agricultural Pests Act, 1983 (Act 36 of 1983) and Regulation 858 of 15 November 2013, Control Measures Relating to Honeybees, in summary you are required to do the following:

1. All bee handlers have to Register with DAFF annually --- & supply certain information.
2. All hives must be marked with the owner's registration number.
3. You have to inspect all your hives regularly.
4. You have to keep appropriate records per apiary site.
5. You must inform DAFF when a notifiable disease or pest is found.
6. You have to carry out the applicable instructions of the executive officer of DAFF when ordered.
7. You are obliged to manage an infected colony effectively or destroy it.
8. You may not move infected hives unless with permission or for control purposes only.
9. Hives may not be moved over "the Bee Line".

We have requested DAFF to enhance the enforcement of these regulations for the sake of the well-being of our Industry.

#### OTHER LINKS FOR USEFUL INFORMATION

1. SABIO website : <http://www.sabio.org.za/>
2. WCBA website : <http://wkbv.co.za/>
3. New Zealand AFB Info : <http://afb.org.nz/>

This guide was compiled with the input from the Bee Section, PPRI-ARC, Stellenbosch and various reputable beekeepers in the Western Cape. It will be updated from time to time as new insight is obtained through better information, experience and understanding.

**SOURCE:** Western Cape Bee Industry Association. *A Guide for Beekeepers : How to Manage AFB*. Third version: March 2015.