

# Your Guide to Healthy Bee Keeping

3rd Edition

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# Welcome



B401<sup>®</sup>

EFB&AFB  
diagnostic kits

SWARM  
Attractant Wipe

vitafeedGOLD

Beetle  
Blaster

apishield

## Welcome from Dr Max Watkins, Director

Vita (Europe) Ltd is firmly established as the world leading company in Bee Health. Our products are sold in over 60 countries, through some 50 distributors. Vita is committed to the research and development of innovative products for the health and wellbeing of your bees. To achieve this we have long-running collaborations with key universities, research institutions, and government agencies all over the world. Vita has no commercial interests in crop pesticides or crop breeding that may be harmful to honeybees.

In this third edition of our popular honeybee health booklet, we hope to impart some of that knowledge and expertise to help you keep your bees happy, healthy and free from disease. The information is also available (often in more detail) on our website at [www.vita-europe.com](http://www.vita-europe.com) and our web app (go to [healthybeeguide.com](http://healthybeeguide.com) on your smartphone), but I hope that this booklet will become a handy reference guide particularly when internet access is unavailable, whilst also containing useful information about our products.

*Happy Beekeeping*

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## healthybeeguide.com

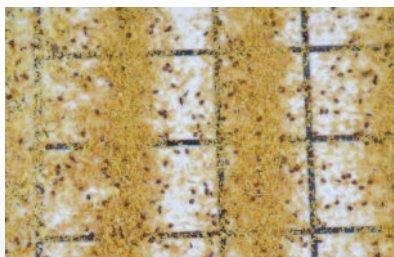
A smartphone web app from Vita to give beekeepers easy mobile access to information about keeping healthy honeybee colonies.

# Varroa

The Varroa mite, *Varroa destructor* (Anderson and Trueman) is a voracious parasite. It feeds on the bee haemolymph, causing grave physical damage, and is a catalyst for viral infections within the colony. Untreated, colonies are destroyed by this pest in just a few years and many, many thousands of hives have already been lost throughout the world due to attack from this mite. Varroa is without doubt the most serious threat to honeybee health worldwide, and is widely believed to be a contributing factor to the phenomenon known as Colony Collapse Disorder.

## Identification

Adult female varroa mites have a hard body, red to dark brown in colour and oval in shape. Mature males and immature stages are usually only found on pupae. Varroa mites conceal themselves well between the sclerites or other inaccessible areas on the adult bee body. This, combined with their colour and small size (1.1 x 1.6 mm), makes them difficult to detect. In addition, bees have great difficulty removing the mites by grooming - so infestation is easily overlooked.



Varroa can sometimes be mistaken for particles of hive debris, flecks from cell sides (older brood comb), or small pieces of propolis. On close inspection, however, the flecks will be irregular in shape while varroa is smooth and rounded with obvious legs.

## Detection

- Examine hive floor debris for mites – purpose-made varroa floors with screens help.
- In heavy infestations, mites can be seen on adult bees, on wax combs and in cells.
- As varroa is more attracted to drone brood than worker brood, uncapping and examining samples of drone brood may be used as a diagnostic tool.
- A sudden crash in adult bee numbers may be an indication of varroa.
- Bees with twisted or shrivelled wings, small abdomens or other deformities may be the result of varroa plus viral infections.
- Poor general colony health and irregular brood pattern may be attributed to varroa plus attack by other disease organisms (viruses, bacteria, fungi) sometimes referred to as Parasitic Mite Syndrome or PMS.

## Treatment

A number of organic and synthetic chemicals, as well as physical control methods, are used in varroa control worldwide. It is extremely important to follow the label instructions exactly and only use approved varroa control products.



Vita promotes Integrated Pest Management: rotation, over a period of two or three years, of treatment method. It is vital that, within an IPM strategy, treatments with active ingredients from different chemical classes are rotated. For example, Apistan (pyrethroid) and Apiguard (thymol) are ideal rotational partners.

Apistan is probably the most widely used varroa control product worldwide. It is easy to use and offers up to 99% efficacy. One simple application can prevent re-infestation from within the colony over two generations of varroa mite.

Apiguard is a natural product with high efficacy and ease of use. It is a sophisticated slow-release gel matrix, ensuring correct dosage of the active ingredient thymol.

## Varroa Control Strategies:

- 1 Monitor the infestation level of the colony.**  
This will indicate whether the mite population is building up to levels that will harm the colony. It will also indicate if the current method of control is effective.
- 2 Use a combination of methods.**  
The most effective control of varroa can be gained by using a combination of both biomechanical and chemical methods. These work in different ways and can be practised at different times of the year.
- 3 Use approved varroacides such as Apistan or Apiguard.**  
These are proven to work and to be safe for bees and the user. It is also important to follow manufacturers' instructions. Incorrect use may result in residues in the hive products and promote the development of mite resistance.
- Use essential oil or organic acid treatments with great care.**
- 4 If legal to do so, in rotation with registered acaricide products in a concerted Integrated Pest Management strategy.**
- Use biomechanical methods.**
- 5 Drone trapping and restricting queen movement can be a useful diagnostic and secondary control measure.**
- Use a co-ordinated approach.**
- 6 Developing a treatment programme with other beekeepers in the area will help reduce the likelihood of re-infestation.**





- Still the benchmark treatment against the varroa mite
- High proven efficacy in just 6 weeks
- Treatment can be made at any time of year
- Safe for bees and users alike
- No residues in honey

## What is Apistan?

- APiSTAN was introduced in the late nineteen-eighties and is sold in over 45 countries worldwide.
- The Active Ingredient (A.I.) of APiSTAN is Tau-fluvalinate, a powerful acaricide from the pyrethroid family.
- Tau-fluvalinate is incorporated into a plastic matrix strip, enabling controlled release of the A.I.
- The amount of A.I. released from APiSTAN strips is the calculated optimum, and a constant release rate gives the most effective control whilst reducing the incidence of resistance.

## Apistan Efficacy

- In the absence of resistance, APiSTAN gives an EFFICACY OF UP TO 99%.
- ONE TREATMENT is enough to give a full year's protection.
- APiSTAN works by contact. Bees pick up molecules of tau-fluvalinate when they brush against the Apistan strip, and the A.I. is transferred by social interaction in the hive, so that the whole colony is protected.
- Due to the eight-week treatment period, APiSTAN kills all emerging mites, preventing re-infestation from within.



## Directions for Use

### WHEN TO USE APiSTAN?

- APiSTAN can be used at any time of year, with best results when applied after the last honey-flow.
- APiSTAN is easy to use. Insert 2 strips into the brood chamber between frames 3-4 and 7-8 for standard hives (10 to 12 frames).
- One strip near the centre of the brood chamber is enough for smaller hives or nuclei.
- Leave the strips in place for 6 to 8 weeks.
- Do not leave APiSTAN strips in the hive after the treatment period, as this can contribute to the development of resistance.

## Safety

When used according to the instructions, APiSTAN leaves no residues in the honey.

APiSTAN is harmless to humans and honeybees. It is registered as a veterinary medicine, but does not require a prescription.

Unlike APiSTAN, "home-made treatments" lack precise dosage of the A.I. and can therefore be toxic to man and honeybee.

**NEVER RE-USE APiSTAN STRIPS**







## Naturally Better *Varroa* Control

- An organic, near-natural treatment
- Proven good efficacy against *Varroa*
- Encourages hygienic behaviour of the honeybee - preventing a number of related problems
- Multiple site action means resistance is unlikely to occur
- Easy to use, safe, and leaves no detectable residues

### Apiguard - The Natural Way to Healthy Bees

Bees frequently suffer from numerous disorders: disease, various parasites and the effects of crop spraying. Despite regular treatment, the *Varroa destructor* mite remains their No.1 enemy. Recently this mite has developed strains, which are resistant to certain active ingredients that were effective until now. A different approach is required to confront this worrying situation.

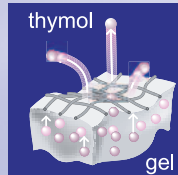
**Apiguard is a new treatment based on natural ingredients that are efficient, safe and beneficial for honeybee colonies. It is the best weapon to fight resistant mite strains. Apiguard provides a natural rotational partner to Apistan®**

#### Apiguard, a thymol-based treatment

VITA (Europe) Limited (UK) conceived, developed and patented the thymol-based treatment Apiguard. Thymol is a natural constituent found in thyme and some honeys such as lime. The efficacy of thymol against *varroa* is already known, as is its positive influence on the colony's health and hygiene. The development of Apiguard gel has optimised the delivery and action of thymol, enabling it now to be used as an effective treatment.



thymol



#### Apiguard, a slow release controlled gel

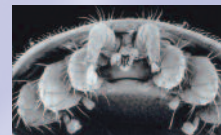
Apiguard is a specially designed and patented slow release gel containing thymol. The gel works like a sponge with the mesh size increasing or decreasing when temperature varies. As the temperature rises, thymol volatility increases, but the mesh of the gel decreases. In this way thymol release is regulated.

#### Apiguard double action

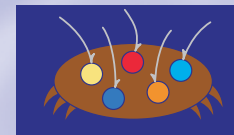
Apiguard has two complementary modes of action. Firstly, the thymol vapour spreads through the colony with the help of fanning from the bees' wings and attacks the *varroa* mites by inhalation. Secondly, the worker bees carry and spread the gel through the colony when they communicate physically with each other. Apiguard then kills off the *varroa* mites by contact

### Practical advice and observations

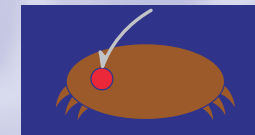
- Make sure the worker bees can access the tray. In some hives, a space has to be provided over the tray, for example, by using an eke, an upside down hive cover or feeder or an empty super.
- Leave the trays in the hive until all the gel disappears.
- Check for changes in the colony: sometimes another off-season treatment is needed.
- After starting the treatment, the colony is sometimes affected by a temporary, but harmless, agitation.
- During treatment, the characteristic smell of thymol is sometimes noticeable.
- NOTE: For small or weak colonies and nuclei, 1x25gm doses should be used.



Varroa destructor



Apiguard: multi-site action



Chemical acaricide: uni-site action

### Apiguard presentation

#### When to use it?

In summer, as soon as possible after harvesting when average daytime temperature is +15°C.

Warmer weather makes the bees more active and they work the Apiguard through the colony. If colonies require feeding start the treatment a few days earlier so that they work the Apiguard first.



#### How to use it?



1. Open an Apiguard tray



2. Put the tray on top of the brood frames



3. Replace with a second tray after 2 weeks



4. The treatment lasts about 4-6 weeks

Product suitable for Organic Farming in accordance with EEC regulation N° 2092/91 modified on 24th June 1991





## Apiguard - Frequently Asked Questions

### 1. What is Apiguard?

A: Apiguard is thymol in a slow-release gel used to control varroa mites in honeybee colonies.

### 2. How do I apply Apiguard?

A: See Vita's instructions on or with the product.

If you are using Apiguard in trays: peel back the lid of the tray and place, gel side up on top of the brood frames. Make sure to leave enough space for the bees to get into the tray (use a spacer [an eke] or preferably an empty super on top of the brood chamber). Close the hive. After 2 weeks repeat with a second tray and leave in place for 2-4 weeks.

If you are using the Apiguard 3 kg (6.6 lb) tub: stir the tub well and use the scoop and spatula to apply 50g Apiguard onto the dosing tray provided. Repeat after 2 weeks and leave in place for a further 2-4 weeks. The ideal treatment period is 6 weeks in total.

If you are using the Apiguard 25g sachet: cut one end of the sachet and squeeze onto the dosing tray provided. Repeat after 2 weeks and leave in place for a further 2-4 weeks. The ideal treatment period is 6 weeks in total.

### 3. What is the best time of day to apply Apiguard?

A: Apiguard can be applied at any time of day but for best results treat colonies in the late afternoon or evening when the temperature is lower and the bees are in or returning to the hive. If the Apiguard can be applied when it is cooler, the rate of sublimation of the gel and the activity of the bee colony is lower and the bees will become accustomed to the odour more readily than if the product is applied at the hottest part of the day, when the bees are most active.

### 4. Can I use Apiguard with a brood and a half or a double brood?

A: Yes, but bear in mind that the level of mite control may be slightly lower than with a single brood chamber, as the number of bees that need to receive treatment is higher. Most bees, brood and varroa will usually be in the lower brood chamber, so place the Apiguard on top of the brood frames of the lower chamber and put the second brood chamber on top (ie the Apiguard is between the brood boxes). Repeat after 2 weeks, following Point 2 above.

### 5. At what time of the year should I use Apiguard?

A: Apiguard is best applied in summer or autumn, outside the period of honeyflow. The external temperature should be above 15°C (60°F), which means that the colony is active. Distribution of the Apiguard gel depends on the bees transporting it around the hive during the process of hive cleaning and this activity increases as the external temperature rises. Application during nectar flows should be avoided in case the honey becomes tainted.

### 6. Can Apiguard be used in springtime?

A: Apiguard can be used in springtime, if necessary, provided the daily temperature is high enough. However, it is not the best time to apply the product. Thymol, which is the active ingredient in Apiguard, can sometimes make the queen stop egg-laying for a short period and that is not what is needed in early spring – the colony needs to be growing. If the mite infestation is high in spring then it is safer to use Apiguard rather than let the mites reproduce further, but treatment is otherwise best left until the summer.

### 7. Should I use Apiguard when supers are on the hive?

A: It is preferable to remove supers before treating with Apiguard. Apiguard may taint honey in supers, but it is

unlikely, especially if the honey stores are sealed.

Apiguard may taint the brood wax, and low traces may reach the wax of the supers. If you do use Apiguard when supers are in place, make sure that the Apiguard is positioned immediately above the brood nest and that the bees have enough room to get into the tray and to walk through the gel.

### 8. Can I feed my colonies whilst using Apiguard?

A: Yes and No. The recommendation is not to apply Apiguard whilst feeding simultaneously in case the bees spend all their time taking the feed and not bothering to clean out the Apiguard gel. This is not a high risk and will vary between different colonies, so if you have to feed and treat at the same time, try it in a few colonies first and see how the bees react.

### 9. The first dose is supposed to be left on for 2 weeks but I've noticed that the gel disappears after only a few days; do I need to put on another dose straight away?

A: No, the speed at which the gel disappears depends on the temperature and on the behaviour of the individual colony. It can take from 2- to 10 days for Apiguard to be removed from the tray/dosing tray. The gel will reduce as vapour is given off and as the bees detect the "foreign material" they try to remove it. At high temperatures the vapours are stronger. The bees will find the gel and try to clean it up quickly. Strong colonies generally work faster than smaller or weaker ones. At lower temperatures, the gel sublimates more slowly. The workers do not detect it as readily and they do not remove it as quickly. Even if the gel seems to have disappeared after only a few days there is no need to apply a second treatment until 2 weeks have passed. The thymol, although not in the tray, is active throughout the colony during this time having been carried around by the housecleaning bees.

### 10. It takes longer for the gel in the second dose to disappear; why is this?

A: The second dose usually lasts longer in the trays because the bees have become more accustomed to the odour of thymol in the hive by this time. The cleaning behaviour is not as pronounced as for the initial introduction.

### 11. After 2 weeks there is still some Apiguard left in the tray or on the dosing card. What is happening and what should I do?

A: Sometimes as the gel dries, the bees lose interest in it. Empty and spread the remainder onto a flat surface (wax foundation, cardboard no larger than about 10 cm x 10 cm). If there is only a small amount of gel remaining, smear it over a small area on the top of the brood frames. This is active Apiguard and will be removed by the bees, which will further help in the control of mites. Do not sprinkle or spread dry thymol crystals thinly over a wide area; this will make the thymol sublime very quickly and may disturb the bees.

### 12. The first dose has been on for 2 weeks, now the second dose should be put on for 2 to 4 weeks. What if I have a honeyflow in this time?

A: If you expect a honeyflow, do not treat. If it is essential to treat before, say, visiting the heather, apply one dose of Apiguard and remove any residual material before the moving of the bees. The second dose should be applied immediately after the honeyflow. This regime may possibly not be as effective as two successive applications of Apiguard.

### 13. Why is the mite drop in the first few days after applying

Apiguard much lower than when using Apistan?  
Apistan (and other pyrethroid-based treatments) are fast-

acting and the active ingredient is quickly spread throughout the hive by contact with the bees, causing a very rapid initial mite fall that is noticeable within the first 24 hours. Apiguard works more slowly as the bees take time to spread the gel and its vapours throughout the hive, so the immediate mite drop may not always be so high as with synthetic pyrethroid treatments, but the effects of Apiguard build up throughout the course of the treatment.

### 14. It's very hot where my hives are but the colonies need treating: is it safe to use Apiguard in these conditions?

A: At temperatures above 25°C (77°F) it is possible to use a half-dose of Apiguard and get a very good mite kill. Use 2 doses of 25g Apiguard, one week apart instead of 2 x 50g at two weeks apart. A third 25g dose is sometimes used after the second week where mite infestations are high. In some countries Apiguard is now available in 25g sachets. When it is very hot, the thymol sublimates faster from the gel and the bees are more active moving the Apiguard around. Both these factors increase the effectiveness of the treatment and less product is needed. Make sure the hive entrance is not restricted, allowing thymol vapour to escape.

### 15. The bees are forming a beard at the entrance to the colony; does this mean the Apiguard is harming them?

A: Bees often form a beard when it's just too hot inside the hive. However, they do this sometimes in hot conditions when Apiguard is first introduced to the hive as they are not used to the vapour that can build up quickly in hot conditions. This behaviour is usually temporary and the bees will go back into the hive. It is extremely rare for the bees to abscond.

### 16. I want to treat nucs with Apiguard. What dose should I use?

A: To treat nuclei or small/weak colonies treat with only 1 x 25g Apiguard – no more than this. For small nuclei reduce this to half again (1 x 12.5g approx). Small (eg, less than 5 frames) or weak colonies may not tolerate a 50g Apiguard dose and brood may be removed by the workers. If brood removal is seen, remove the product from the colony.

### 17. I used Apiguard in the spring and my colony seems very small, why?

A: It could be that the queen stopped egg laying for a short while. This doesn't often happen but, if it does, it is a temporary effect only. She will resume egg-laying when the thymol odour is dissipating, after around 3 weeks, with no damage to the colony or to the queen.

### 18. What mite control level will I get by treating with Apiguard?

A: Apiguard often gives results as good as those obtained previously with Apistan or Bayvarol but a lower efficacy should be generally expected, somewhere between 85-95% varroa control. The average we have recorded after thousands of hive treatments is 93%. Apiguard works better the warmer it is, up to 40°C (104°F).

### 19. Why should I use Apiguard if it doesn't work as well as Apistan or Bayvarol?

A: Strains of Varroa mite resistant to pyrethroids (active ingredients of Apistan and Bayvarol) exist in many areas. Apistan and Bayvarol may not be effective in those areas so another type of treatment needs to be used. Apiguard works in a different way to pyrethroids and will kill pyrethroid-resistant mites. Where resistant mites are not already established it is a good idea to "rotate" treatments between pyrethroids and Apiguard. Apiguard is an effective alternative treatment, authorised as a veterinary medicine for use on honeybees in many countries.

### 20. Can I use Apiguard and Apistan at the same time?

A: This is not usually necessary. However, where average daily temperatures are too low for Apiguard to be fully effective and there is an element of resistance to the active ingredient of Apistan, studies have shown that using Apiguard and Apistan at the same time can give highly effective varroa control.

### 21. Are varroa mites resistant to thymol?

A: At the moment, no. Pyrethroids and other "traditional" pesticides kill their targets by acting on specific nervous channels in the mite or insect and it is relatively simple for the mite or insect to change its physiology slightly (over a number of years) so that it is no longer affected by the nerve agent. Thymol acts in a very different way. As a protein denaturant it disrupts cell membranes and affects all cellular processes. It is a very general mode of action rather than being highly specific. It should be more difficult for the varroa mite to change all of its body functions to become resistant to thymol. Vita is monitoring mite populations in Europe and we have found no thymol resistance yet. Although it is not impossible it is less likely that thymol-resistant varroa will arise in the near future.

### 22. Can I use Apiguard with open mesh floors?

A: Thymol vapours are heavier than air and with an open floor it would be expected that much of the value of the treatment may be lost. However, there is no clear evidence if this in fact happens. We advise to close up open mesh floors or to insert the varroa collecting tray during the Apiguard treatment and open them again afterwards, but this is a matter of choice. Do not close up hive entrances during treatment.

### 23. Why is Apiguard a gel? Can't I just use thymol?

A: Thymol is an effective pesticide but when applied as raw crystals or in dry formulations it can be difficult and hazardous to use and the mite control levels will be variable. In cold conditions, the thymol crystals do not sublime quickly enough and mites are not controlled but in hot conditions thymol crystals will sublime too quickly, shocking the bees into absconding and often killing bee brood. This is why Apiguard was developed in a gel, to give a slow-release system for the thymol, allowing bees to acclimatise to a low thymol concentration before gradually building up to a mite-lethal level. When used as directed, the Apiguard gel is safe for honeybees and brood.

### 24. How do I store the Apiguard?

A: Apiguard should be kept out of direct sun and heat and ideally stored at temperatures lower than 30°C (86°F). The gel will start to separate into solid and liquid phases at around 38°C (100.4°F) and even with stirring the gel may not regain its original quality once this has happened. The results obtained with separated gel cannot be guaranteed. Therefore, do not keep Apiguard in the back of a beekeeping car or truck in hot conditions for any longer than is necessary. Keep the product below 30°C (86°F) in transport where possible and in storage.

### 25. Where can I find out more information?

A: For any more information about Apiguard, please see [www.vita-europe.com](http://www.vita-europe.com). You can also get in touch with your local distributor – their contact details are listed on the website.





## Wax Moth

The greater wax moth *Galleria mellonella* is estimated to cause upwards of \$5 million worth of damage a year in the United States alone.

The adult wax moth is greyish brown and has a wingspan of around 3 cm. The adult female moth penetrates the hive and lays her eggs directly on the comb. The wax moth larvae feed on the wax, the pollen, and even, if there are many larvae, on the host's brood.



Photo: Pierre-Paul Merck



Wax moth larvae live on impurities in the comb (rather than, as their name suggests, the wax itself), and so prefer to live on comb that has been used for brood rearing. Foundation is rarely consumed, but in capped honey, young larvae tunnel just below the cappings, which causes harvested honey to leak, and comb honey to become less attractive.

Since wax moth numbers are kept under control by healthy colonies, it is in weakened or abandoned hives, or stored frames, that populations explode. In this case, all four life stages can be found, along with tunnels of silk throughout the combs, and deposits of dark faecal matter. Very quickly, all that will remain is gritty debris of comb remnants on the bottom board, and cocoon attachments. Little or no comb survives intact after a wax moth infestation.

### Control - In Stored Comb

Removal and storage of drawn comb (particularly in warmer temperatures) increase the risk of infestation. Trying to protect comb within plastic bags can be ineffective since eggs could already be present. Similarly, storing outside is only an effective strategy when temperatures are consistently below freezing throughout the storage period.

The naturally occurring bacteria *Bacillus thuringiensis* offers highly effective protection against wax moth. The Vita product B401 (also known as Certan) is a concentrated solution of *B. thuringiensis*, which offers up to 100% efficacy.



# B401<sup>®</sup>

The Natural  
Solution to the  
Wax Moth  
Problem



- **B401** is a concentrated solution of *Bacillus thuringiensis* - completely harmless to humans and honeybees
- **B401** has an efficacy of 100% against wax moth larvae
- A single application of **B401** ensures protection of the frames until the next season
- **B401** does not leave residues in wax or honey
- **B401** is an environmentally friendly product





## When to use B401

- After the honey harvest, when the frames are stored. Protection will be effective right up to the installation of the frames again the following season.
- For decoy or empty hives.
- B401 only kills young wax moth larvae and must be used as a preventative treatment before the combs are infested.

## How to prepare B401

B401 is made of spores from *Bacillus thuringiensis* and must be diluted in water to 5% (1 part B401 to 19 parts water).

Vigorously shake the bottle of B401 before adding the contents to the corresponding volume of water.

Once diluted, the solution must be used the same day. Before mixing, calculate the amount of product required to treat the desired number of frames.

## Quantity of solution

For up to 100% wax moth control, apply 1.5ml of solution per 10 square centimeters of comb, on both sides of the frame. The guide below may make the calculation of the required quantities of B401 easier.

Type of frame	No of frames treated with 120 ml of B401
Dadent brood nest	50/70
Dadent super	100/150
Langstroth	70/100

## How to apply B401

- Shake the mixture well before use to get a homogeneous solution
- Using a sprayer, apply evenly all over both sides of the combs
- Before storing, let the frames dry in an aired room to avoid mould.

## Storage & conservation

- Store B401 at a temperature between 5°C and 20°C
- If stored in a cool place (under 12°C) and in its sealed original bottle. B401 can be kept for several years.

## Safety of B401

- B401 does not leave any residue in the wax or in the honey, unlike paradichlorobenzene, which is a toxic product and forbidden in the UK for any agricultural use.
- B401 is harmless to bee larvae and adult bees.
- Aizawai serotype 7 (present in B401) is the sole variety of *Bacillus thuringiensis* to give excellent results against wax moth. Some other types of *Bacillus thuringiensis* are toxic to human & bees.



Photo: Pierre-Paul Merck



Photo: Pierre-Paul Merck

**B401 is packed in 120ml bottles (10-15 Dadant supers) and in 1 litre bottles (85-125 Dadant supers and is available from beekeeping dealers.**

Product suitable for Organic Farming in accordance with Council Regulations EEC No 2092/91 modified on 24th June 1991"

**B401 is a Vita-Swarm product**





## European & American Foulbroods

**American Foulbrood (AFB)** is the most serious, contagious notifiable bacterial disease of honeybee brood of international proportion. The causative organism is a virulent spore-forming bacterium, *Paenibacillus larvae* subsp. *larvae*. AFB can appear and spread quickly through a colony and if left untreated may result in the death of the hive in a short space of time.

**European Foulbrood (EFB)** is also a serious bacterial disease of honeybee brood of international proportion. Its incidence is apparently increasing and there is considerable pressure from beekeepers to improve EFB control. European foulbrood is sometimes not regarded as such an important disease as American foulbrood yet the two are often confused or mis-diagnosed.

In the UK around 50% of EFB-infected colonies per year are destroyed, with costs to beekeepers also posed by standstill notices on infected apiaries (in place for years in some areas), losses of honey yields, pollination contracts and sale of bees.



It is vitally important to detect foulbrood as early as possible, and distinguishing between EFB and AFB can be difficult. In colonies infected with either foulbrood, the brood pattern can appear very patchy and irregular (sometimes termed 'pepper-pot') in distribution.

A key diagnostic difference between AFB and EFB is that, in differentiation to AFB, cadavers of EFB-infected larvae cannot be stretched (or 'roped out') with a matchstick or similar instrument. Cadavers of larvae infected with AFB die in the late larval stage. As the cadaver decays it becomes gelatinous.

Giving field results in just three minutes (validated to over 98% accuracy), **Vita Diagnostic Kits** for AFB and EFB are an essential tool allowing every beekeeper to test their hives at the first suspicion of the presence of AFB or EFB.

## EFB&AFB diagnostic kits



It is vitally important to detect EFB and AFB as early as possible in order to prevent its further spread to healthy colonies.

Vita's two quick and effective diagnostic kits, developed with Central Science Laboratory enable every beekeeper to test their hives at the first suspicion of the presence of EFB or AFB.



### Vita Diagnostic kits for the early detection of EUROPEAN FOULBROOD & AMERICAN FOULBROOD

Vita Diagnostic kits take  
just 3 minutes to give a  
result and have been  
validated with 98% accuracy





European and American Foulbrood can have very serious consequences for your bees and for nearby apiaries. Rapid and accurate detection in the field is essential to minimise damage.

### THE PROBLEM

In their early stages, American and European Foulbroods can easily be mistaken for one another, for pseudo-foulbroods, or for other diseases of the hive. A method for early detection of the causative agent is required, allowing early action and the prevention of further proliferation.

*Early detection is essential because just one infected cell can lead to the destruction of an entire apiary.*

### AMERICAN FOULBROOD

American Foulbrood (AFB) is an infectious brood disease caused by the spore-forming bacterium *Paenibacillus larvae* subsp. *larvae*, it is the most destructive and widespread of the honeybee brood diseases.

AFB disseminates rapidly through the colony and, if left unchecked, spreads quickly to other healthy colonies both in the same apiary and those nearby.

### EUROPEAN FOULBROOD

European Foulbrood (EFB) is a bacterial brood disease caused by several agents, the main being the bacterium *Melissococcus plutonius*. It occurs most frequently in the spring or early summer during brood rearing and is thought to be caused by stress in the colony and lack of pollen.

Symptoms can be variable which makes EFB difficult to identify with certainty; frequently disappearing once there is a nectar flow. But EFB can seriously affect brood development and needs to be identified in a colony as soon as possible.

### THE SOLUTION - VITA'S DIAGNOSTIC KITS

Vita's diagnostic kits are specific to either *Melissococcus plutonius* (EFB) or *Paenibacillus larvae* subsp. *larvae* (AFB). Diagnosis takes just three minutes to give a result, and has been validated with a 98%+ accuracy.

The kits are extremely simple to use in the field, and require no samples to be sent away to laboratories. Anyone can use Vita's diagnostic kits to confirm or allay their suspicions of infection.

Developed in conjunction with Central Science Laboratory Pocket Diagnostics, the kits are based on similar technology to that of the highly successful home pregnancy test kits, and react specifically to the antibodies associated with the causative pathogens of American or European Foulbrood in honeybees.

Vita's diagnostic kits are rigorously tested for use in the field. They have been validated at the National Bee Unit of the Central Science Laboratory and at other institutes internationally, and they enable every beekeeper to test their hives at the first suspicion of the presence of EFB or AFB. The kits are an ideal tool in the training of beekeeping experts.

### INSTRUCTIONS FOR USE

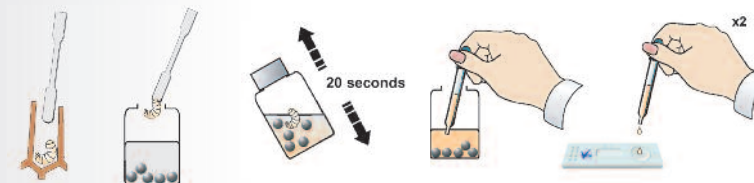
1. For best results, up to three larvae with suspicious symptoms are extracted with the spatula provided and deposited into the extraction bottle.

#### IMPORTANT:

**EFB Kit:** When testing for European Foul Brood, it is best to extract young suspect larvae, as in older larvae other agents may mask the antibodies released by *Melissococcus plutonius*.

**AFB Kit:** *Paenibacillus larvae* subsp. *larvae*, however, may be at concentrations below the detection level in young larvae. If testing for American Foul Brood, therefore, larvae with clear suspicious symptoms should be chosen.

2. The bottle is shaken vigorously for about 20 seconds, until the sample is thoroughly mixed with the buffer solution. Immediately after shaking, a little liquid is extracted from the bottle with the supplied pipette.
3. Two (AFB) or three (EFB) drops are squeezed into the sample well of the device.
4. After approximately three minutes the Control line (labelled C) appears and the result may be read.



### INTERPRETING THE RESULTS

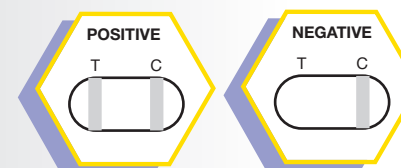
After 3 minutes, the Control line should be clearly visible in the viewing window of the device. A positive result (two lines show up, both Test and Control, see diagram) indicates that the target pathogen is present in the test sample.

A negative result (Control line shows up only, no Test line) indicates that the AFB/EFB pathogen has not been detected in the test sample.

If the Test (T) line is visible, even if it appears faint, this constitutes a positive result, indicating the presence of either American or European Foul Brood.

Please note that the two Vita Diagnostic Kits are highly specific. A negative result with the AFB kit, for example, does not preclude the possibility of the presence of EFB. The correct kit should be used depending on which disease is suspected.

As with all diagnostic testing, a negative reaction does not necessarily indicate that the target pathogen is absent. A faint or absent line may indicate a low concentration of the pathogen, or recent infection. If in doubt, repeat with a new device using a fresh sample or repeat in a few days time.





## Nosema

Nosema, caused by the parasite *Nosema apis* and *ceranae*, leads to dysentery and other serious side-effects such as reduced yield, increased winter losses, shortened life-span, and increased susceptibility to supersede.

Nosema is also known as 'Spring Dwindling disease' because as the weather improves and bees are able to leave the hive to defecate so the disease level often drops and (although colonies will not do as well as those that were uninfected), they often recover for the summer. Apart from good husbandry techniques such as removing stress factors and providing sufficient nutrients, the only treatment option currently available is the antibiotic Fumagillin. However, many beekeepers have stopped using Fumagillin because they found that colonies built up too quickly and swarm control became nearly impossible. This product has also been withdrawn from a number of countries because of antibiotic residues in hive products.



A new alternative is **VitaFeed Gold**, a natural biostimulant that provides controlled brood build-up, stimulates colony development and is particularly effective when applied to colonies infected with Nosema. **VitaFeed Gold** contains no antibiotics and leaves no harmful residues.

## Chalkbrood

Fungal spores of the causative agent of chalkbrood, *Ascosphaera apis*, develop into mycelia in capped cells - eventually engulfing the entire larvae, giving a white fluffy cotton-wool appearance.

### Diagnosis:

The larval cadaver shrinks and dries to form a white or grey-black chalk-like mummy. Frames with a high level of chalkbrood rattle, in addition holes in cell cappings are found (cut by nurse bees when retrieving the mummy to discard it). These discarded mummies can be found near the hive entrance of infected colonies.

### Treatment:

No registered commercial treatments are currently available. However, studies have shown that approved varroa medications containing thymol are also effective against chalkbrood.

# vitafeedGOLD™

## Enhanced liquid feed for honeybees



Available in a 250ml bottle, providing five complete treatments, or a 1 litre bottle sufficient to treat 20 colonies.

- ◆ **VFGold** strongly stimulates colony growth
- ◆ **VFGold** leaves no residues
- ◆ Simple to apply and very safe to use
- ◆ Based on natural beet extract and molasses
- ◆ **VFGold** contains no antibiotics

### Mode of Use:

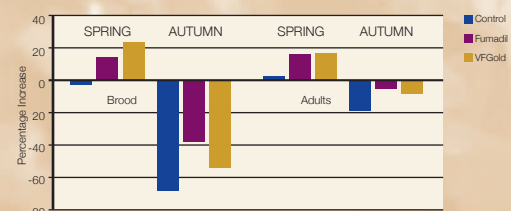
Prepare a 10% solution of VITA FEED GOLD™ in sugar syrup (50% water and 50% sucrose). For example, 100ml of VITA FEED GOLD in 900ml of syrup. With a large syringe, sprinkle the solution over honeybees in the bee-ways, using 100ml of the mixture per colony. Apply this quantity 5 times; one application every other day, for 9 days. Apply in autumn after the supers have been removed, with the last feeding of the year, or in spring after the first cleaning flights.

**VFGold** is particularly effective when applied to colonies affected by diarrhoea.

- ◆ Dramatic reduction in incidence of diarrhoea
- ◆ Increase in bee population
- ◆ Controlled brood build-up



Colony Population After 12 Days - Application in Spring or Autumn



**VITA**  
We Care for your Bees



## Swarming

Honeybee colonies multiply by splitting, a process known as 'swarming' that usually takes place over a two- to three-week period in spring. The original queen leaves the hive with around half of the worker bees; a swarm can contain up to tens of thousands of bees.

Swarming usually takes place when a colony is expanding fast with surfeit flying bees and good stocks of honey. The bad news for a beekeeper is that the swarming bees take as much of this valuable honey with them as they can carry.

While swarming is a natural tendency allowing the superseding of old queens it can also be induced by insufficient space or stresses such as parasites or disease.

### Swarm Control



Beekeepers can try to reduce a colony's desire to swarm with various techniques such as removing frames of brood comb or shaking out package bees (bees rarely swarm when they perceive that resources or population numbers are low). They can also assist the bees in more controlled reproduction by artificially splitting hives. Another control method is to clip one wing of the queen, any resulting swarm will gather outside the hive waiting for the queen (who is unable to fly) and will be easy to catch.

### Swarm Capture

A newly settled swarm can often easily be captured in a skep or empty box (perhaps with just one frame inside). Alternatively, a more established swarm can sometimes be encouraged up into a skep held above it by gentle application of smoke. Equipment is available to suction pump bees into a box, or they can be sprayed with sugar solution and shaken off their perch onto a white sheet containing a skep or box.

Perhaps the easiest way to catch either a passing swarm or one of your own colonies swarming is with a lure such as the Vita Swarm Attractant Wipe, which can be hung or wiped in a skep or empty box and is extremely attractive to swarming bees.

### Swarm Hygiene Precautions

If you do not know the origin of the swarm you catch, it may be advisable to allow the swarm to draw some comb with the honey stores it carries and then to dispose of that comb for hygiene purposes. This may help quarantine any disease the swarm may carry.

# SWARM

## Attractant Wipe

Packaged in a small sachet, the swarm attractant resembles a cleansing wipe and is impregnated with essential oils extracted from plants. To activate, the sachet can be pierced and hung in an empty hive, skep or other suitable container, or it can be wiped over the inner surface of the container.

The swarm attractant will keep for about two years in a fridge and will be effective for up to 10 days once opened (depending upon the ambient temperature).

### Directions for use

Tear the sachet open a little or pierce a hole and hang it in a convenient place (perhaps a tree or a post) or just inside the entrance of a bait hive.

Place traps around the apiary or bee yard at a maximum distance of 50 metres apart.

Once opened, the attractant sachet will be effective for up to two weeks depending upon environmental conditions. (The warmer it is, the quicker the attractive substances dissipate.)

### Disposal

After use, please dispose of the sachet and its contents according to local regulations. Used sachets can be placed in domestic refuse.

### Tips

- 1 The optimum height for positioning of the Swarm Attractant is 1.8 to 2m above the ground.
- 2 When using a bait hive, pin the open sachet to an empty brood comb.
- 3 The optimum positioning of the entrance to the bait hive or box is due south in the northern hemisphere, north in the southern hemisphere.
- 4 The efficiency of the Swarm Attractant can be increased by dipping the lower end of the sachet in molten wax - but take care as molten wax can cause injuries!

Dr Max Watkins, Director of Vita (Europe) Limited:

" This new swarm attractant will provide a very useful tool for beekeepers. It will help to attract passing swarms, and to lure swarms temporarily hanging in trees and other awkward places into a skep or box containing the swarm attractant. It will even reduce the risks of swarms leaving the apiary if a bait hive contains the attractant. Beekeepers tend to be very resourceful and innovative, so I also expect to hear about novel uses! "



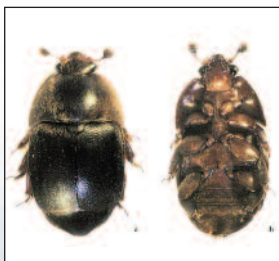
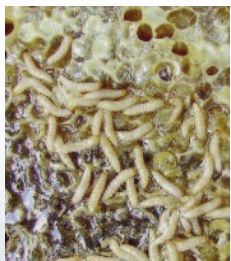


## Small Hive Beetle

The small hive beetle (*Athina turnida*) is native to South Africa and is so called because bee colonies there are also tormented by scarab beetles (known as large hive beetles). In its native range, the small hive beetle's impact on a parasitized colony tends to be minimal and the beetle even confers a positive benefit, often disposing of weakened/diseased hives or abandoned nests that may harbour diseases. However, small hive beetle (SHB) has been introduced into the USA, Canada, Australia and Italy where honeybees are more susceptible than those in South Africa – suffering greater damage and collapsing more frequently. In Florida, United States, 20,000 hives were lost in the first two years of an outbreak of SHB.

### Identification

Adult small hive beetles average 5.7 mm in length and 3.2 mm in width but vary in size depending on climatic conditions and food availability. A strong flier, the SHB usually takes to the air around dusk and is capable of covering a distance of several kilometres. Adult small hive beetles often hide on the bottom of cells, in debris at the bottom of the hive or in small cracks and crevices. SHB larvae are creamy-white and up to 1 cm in length.



Colonies invaded by SHB are commonly described as a mess. The SHB larvae tunnel through combs and cappings, eating and destroying them and often causing the honey to ferment, giving off an orange-like smell. In very heavy infestations, bees simply abscond from the hive.

### How SHB Spreads

Small hive beetles spread through various methods including bee shipments, feral swarms, beekeeping equipment, comb, beeswax, imported goods such as fruit and migration between colonies by flying.

Adults can survive for two weeks without food and water, seven weeks on used comb, and many months on fruit. Once in a hive, adult small hive beetles can live for up to six months before their presence becomes obvious. The females will lay many eggs in cracks and crevices in the hive. The larvae then emerge to do the damage and before pupating leave the hive and bury themselves in ground nearby.

### Prevention and Control

There is no known way to eradicate SHB. Physical traps such as Beetle Blaster will help control the beetle population and beekeepers should practice good husbandry to maintain strong colonies; narrowing hive entrances can help. Vita Feed Gold will help keep colonies strong and healthy and lower the risk of a severe attack. Weak colonies are much more vulnerable to attack by SHB.

Small hive beetle larvae pupate in soil so drenches and even applications of entomopathogenic fungi and nematodes can be useful in SHB control.

## How to protect your bees from Small Hive Beetle with the

# Beetle Blaster

**SIMPLE** - Apply two traps to each brood box or super

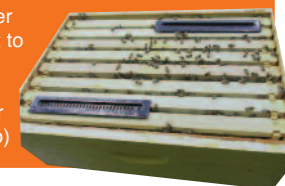
**ECONOMICAL** - Requires only food-grade oil

**EFFECTIVE** - SHB hide in the Beetle Blasters where they are trapped



**SMALL HIVE BEETLE  
CONFIRMED IN ITALY  
AND SPREADING  
FAST**

2. Place two traps in each hive body, one between frames 1 and 2 and a second between frames 9 and 10. Stagger placement to offset the traps from each other (see photo)



1. Half fill the Beetle Blaster with mineral or vegetable oil taking care not to spill any into the hive. It may be easiest to use a syringe. Wipe off any excess



3. Carefully remove and replace the traps when they contain more than 10 Small Hive Beetles or after two weeks, whichever comes first. Discard used traps according to local regulations

4. To remove, run a hive tool over both sides of the trap to kill any beetles hiding beneath. Then, space out frames to allow the Beetle Blaster to be gently eased out, taking care not to spill any oil





## Asian Hornet

The Asian hornet (*Vespa velutina*) originates from Southeast Asia and is thought to have arrived in France (from China) in 2004, before spreading rapidly through France and Western Europe. *V. velutina* is a highly aggressive and effective predator of honeybee colonies, responsible for devastating losses.

### Identification

Slightly smaller than the European hornet (up to 25 mm in length), *Vespa velutina* has characteristic yellow legs, a dark velvety thorax and a dark abdomen with a distinctive yellow band on the fourth segment.



*V. velutina* is a day flying species which, unlike the European hornet, ceases all activity at dusk. The Asian hornet's large nests can be found at the top of large trees but also in garages and sheds and even under decking.

### How Asian Hornet Spreads

The most likely introduction pathway for *V. velutina* is accidental via trading activities. The fact that the fertilised queens can survive long periods of time hibernating makes it an ideal candidate for long distance transport in shipments of goods, for example in containers, in pots, in building material, under the bark of trees, in decorative material or wooden items or in cars, boxes, trucks, farming equipment, etc.

Only one mated queen is needed to start a new colony and initiate further spread of the species; the French population originated from a single queen. In France, *V. velutina* spread to cover 120,000 km<sup>2</sup> within 3 years, demonstrating that it can colonise large areas in a very short period of time if the climatic conditions are favourable.

### Control

Total eradication is generally considered impossible, but management plans can target the Asian hornet at different life cycles, and can include nest destruction, trapping of workers and queens, reproductive control and biological control.

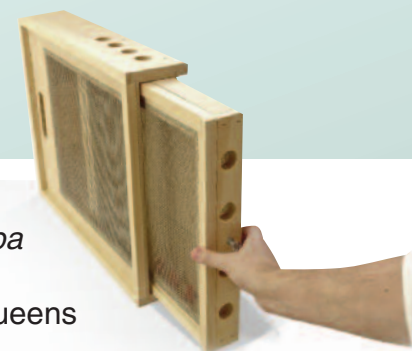
Nest destruction must not take place during the day or returning hornets will simply set up new nests in the vicinity, making the problem worse. Vita's ApiShield trap is unique in trapping hornet workers and queens by using the bee colony as bait, thus requiring no chemicals or other attractants. The ApiShield trap is selective to predators of honeybees, easy to use and low maintenance. Importantly, by trapping hornet queens, invasive spread is inhibited.

# apishield

## WASP & HORNET TRAP



Are you ready  
for the **ASIAN  
HORNET?**



Protect your bees from *Vespa velutina*, Wasps, Wax Moth, Robber Bees and Hornet Queens

# 8

- Protects your bees from attack
- Easy to use and low maintenance
- No mess, No chemicals, No consumables
- Acts as *Varroa* floor / screened bottom board
- Ideal for use in apiary sentinel hive
- Just one ApiShield trap per five hives
- Protects against robber bees
- Preventing disease spread

From Vita (Europe) Limited in conjunction  
with scientists and bee researchers

  
We Care for your Bees