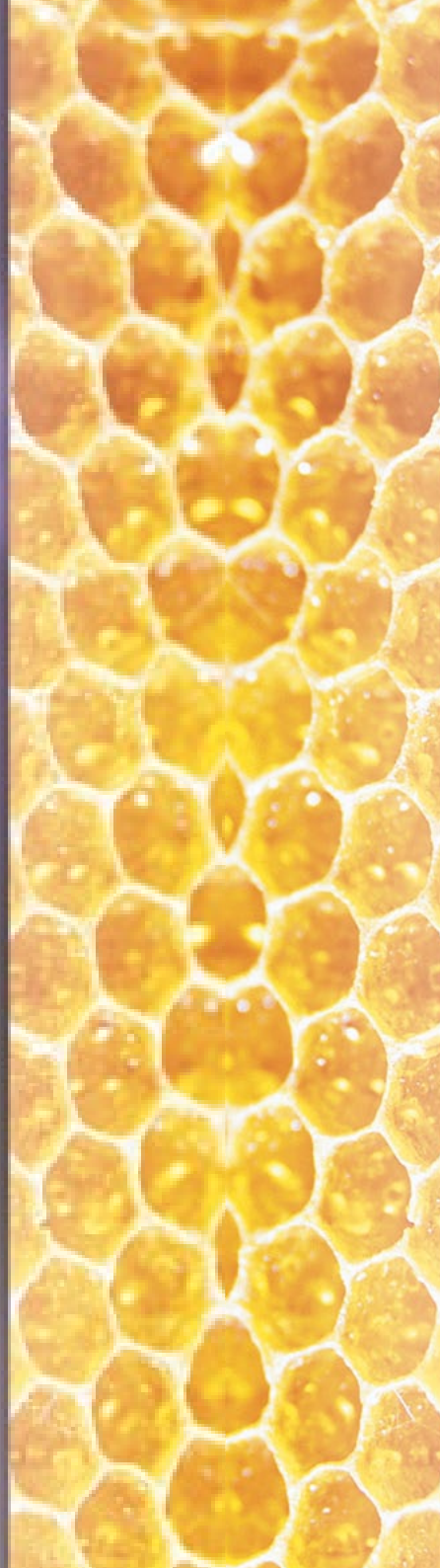


# Apivar®



**V**éto-pharma  
*Committed to Apiculture*

U.S. Agent: Arysta LifeScience America Inc., 1450 Broadway, New York, NY 10018 Tel: 212-930-5101  
www.apivar.net • email: info@apivar.net



# Apivar®



Simple, safe and  
effective control of  
Varroa mites



**V**éto-pharma



## North American beekeepers now have an effective new weapon against Varroa mites

# Apivar®

- ◆ Kills up to 99% of mites in one application
- ◆ Proven safe and effective for more than 15 years
- ◆ Leaves no significant residues in hive products
- ◆ Convenient and easy to use



### NOTICE TO U.S. CUSTOMERS

Apivar® has been approved under Section 18 emergency use exemptions in select states. Apivar does not have Section 18 approval in all states. Prior to using this product, contact your local Department of Agriculture, your Apivar distributor, or visit [www.apivar.net](http://www.apivar.net) to determine the status of Section 18 authorization in your state.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.



### Apivar effectively controls Varroa mite infestations

Apivar is the only amitraz-based apiary product to treat not just one generation of Varroa mites, but several successive generations, reducing mite populations in the hive by up to 99 percent. Apivar's controlled-release technology distributes Amitraz over a minimum six-week period, ensuring healthy and productive hives when used as directed.

### No evidence of resistance after more than 15 years

Apivar's active ingredient has not been shown to encourage bio-resistance. Apivar has been used for more than 15 years in France, and is now authorized in more than 10 other nations, including Canada, New Zealand, Japan, and many European countries. Apivar users world-wide have been unable to detect any resistance to Apivar's active ingredient.

### Apivar leaves no significant residues in honey or wax

No significant residues were found in honey, wax, propolis, or pollen following Apivar treatments at the recommended dosage. Furthermore, safety studies performed by independent research centers have shown that even when hives are exposed to *five times the recommended dosage*, Apivar is harmless to queens and bees, and does not leave significant residues in hive products.

### Conveniently packaged and easy to apply

Apivar is packaged in vacuum-sealed foil pouches, and does not require measuring, mixing or complicated application procedures. Simply tear open the foil pouch, remove and separate the double strips, and insert them in the brood chambers according to instructions. A single application of two strips per brood chamber is enough to treat a hive, so you spend less time and effort treating your bees and there is less disruption of the bees than with many other treatments.



J. Blaire





The female Varroa mite's reproductive cycle is very short and coincides perfectly with that of the European honeybee, making them bees' worst enemies. The mite shown above (enlarged about 24 times) is slightly more than one millimeter long.

## Varroa mites threaten North America's agricultural economy

Bees play a vital role in plant pollination, helping to produce an estimated \$40 billion worth of products annually in the United States alone. The American Institute of Biological Sciences estimates that native insect pollination saves the US agricultural economy some \$3.1 billion annually through natural crop production. Given the vital role that bees play in North America's agricultural economy, ensuring their long term health and productivity is an imperative.

Varroa mites harm bees by feeding off their haemolymph (blood) at the larva stage. The resulting damage includes:

- ◆ Reduced size and weight
- ◆ Reduced life-span
- ◆ Poorly-formed wings
- ◆ Reduced immunity to disease
- ◆ Reduced resistance to pesticides
- ◆ Reduced ability to feed
- ◆ Reduced ability to perform their duties in the colony

### Mites introduce disease, viruses and bacteria

When the Varroa mite pierces the bee larva cuticle to feed on its haemolymph, it inoculates the larva with a number of viruses, such as Acute Paralysis Virus, Deformed Wing Virus, and Cloudy Wing Virus, as well as a wide range of bacteria. Recent studies have proven that the Varroa mite amplifies and/or activates some viruses.

Once weakened, the colony becomes susceptible to robbing by bees from other colonies. It can take only a few hours for a colony to rob honey and pollen stocks from a weakened hive. Varroa mites are attracted to the robbing bees and are quickly transferred by them to their origin hive. This natural bee behaviour increases the risk of contamination and re-infestation, and contributes to the spread of varroaosis.

### Rapid reproductive cycle requires long acting solution

An adult female mite lives about two months in the summer and five to six months during the winter, when no brood is produced. As a result, a single female Varroa mite can produce five or six generations of mites during its lifetime. Without treatment, only about one percent of Varroa mites in a hive will die from natural causes in a day, leaving a large population of mites to reproduce in the brood cells, further weakening the hive and contaminating new hives.

The only effective treatment for Varroa mites is one that continues to act over a long period of time, treating multiple generations of mites and thereby reducing their negative impact on the health of the hive.

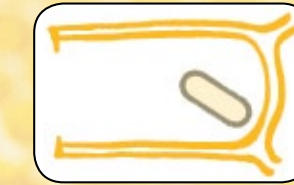


The life cycle of a Varroa mite starts with the immature mite (lower right) and ends with the adult mite (upper right).

## Apivar treats multiple generations of mites to ensure a healthy colony

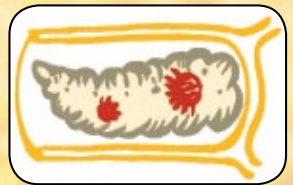
The Varroa mite's rapid rate of reproduction means that just a few female mites can produce many thousands of offspring during the course of a year. That's why Apivar is so effective — it treats several successive generations of mites, instead of just one.

### Egg laid by the queen



A bee larva is deposited in the open brood cell.

### 10–11 days after laying



The female mite lays an egg every 30 hours. The first offspring is a male; the subsequent offspring are all female.

### 8 days after laying



A fertilized female Varroa mite enters the cell 15 hours before it is capped.

### 12–20 days after laying



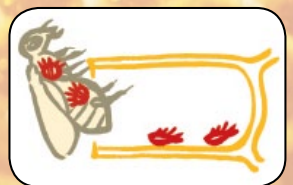
The female mite continues to lay eggs. As soon as the female offspring reach sexual maturity (in 5 to 6 days), they are fertilized by the one male mite in the cell.

### 9 days after laying



The cell is sealed with a wax cap and the fertilized Varroa mite is enclosed within the cell, where it feeds on haemolymph from the bee larva.

### 21 days after laying



The young bee leaves the cell carrying two fertilized female mites. Immature mites and the male remain within the cell.



## The Apivar Advantage:

# Apivar protects your bees ... and your investments

Apivar was formulated by a team of beekeepers and scientists to address the Varroa mite problem. After 15 years of use, Apivar has proven a uniquely safe and effective solution because it delivers a powerful active ingredient — amitraz — via controlled-release technology in the form of a plastic polymer strip.

Amitraz is a sub-lethal miticide, meaning that it does not kill mites directly, but instead paralyzes them, leading to their starvation. Amitraz is delivered to the honey bees via the strip, which was chosen for its rigidity and its ability to continuously release the active ingredient over a minimum six-week period. The chart on page 5 illustrates how a single application of Apivar works to control Varroa mites through an entire beekeeping season, while short-acting treatments fail to fully control mite infestation even after multiple applications. Short-acting treatments also require frequent re-treatments that may significantly affect the health of the colony.

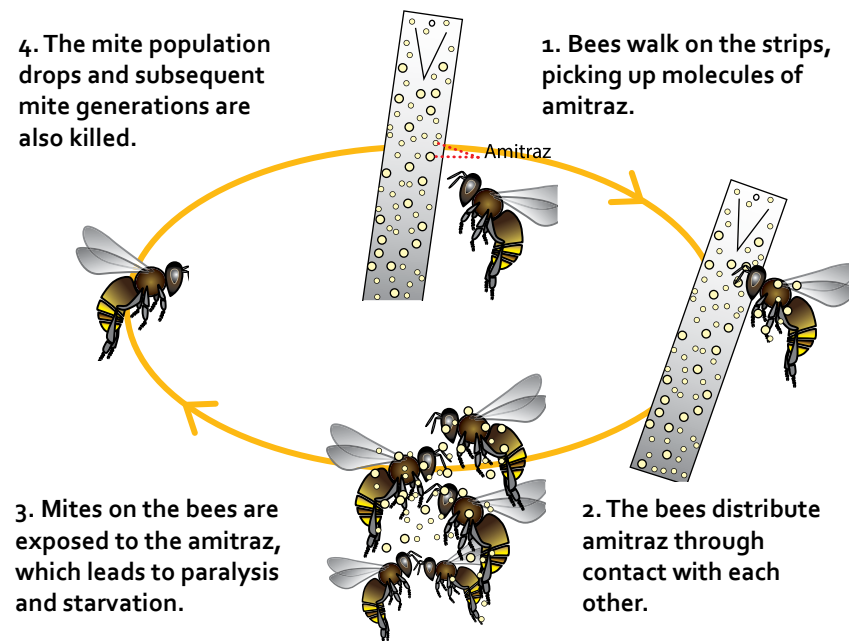
Apivar works by contact only, so it is very important to position the strips in an area of high bee activity, typically in the brood area. This ensures that bees

will come in frequent contact with the strips, thereby distributing amitraz throughout the hive. Some practices, such as bee feeding, can increase activity and further ensure full distribution of the active ingredient.

### No evidence of resistance

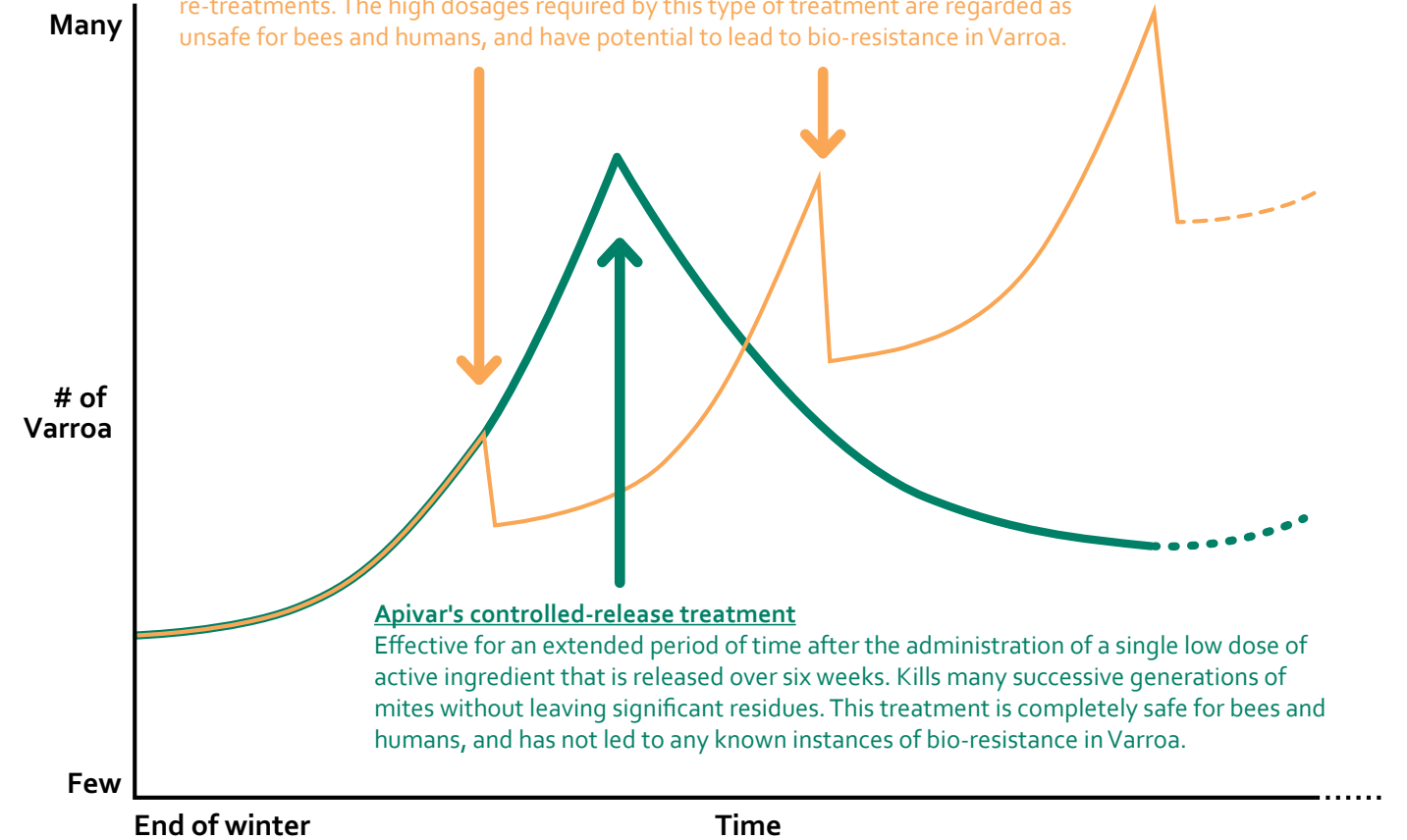
One of Apivar's key advantages is that its active ingredient breaks down quickly in acidic environments, such as bee hives, once released from the strip. This means the active ingredient does not accumulate in honey or wax (which is not the case for pyrethrinoids or coumaphos).

As a result, even after 15 years of use, there is no evidence that Varroa mites have developed resistance to amitraz. However, to ensure that resistance does not develop, it is important to read and follow all instructions. An excessively low concentration of active ingredient — resulting from the use of only one Apivar strip instead of the recommended two strips per brood chamber, the re-use of old strips, or failure to remove strips at the end of the treatment period — has potential to create resistance to the active ingredient.



### Competitors' short-acting treatments

Effective for only 1 - 2 days after the administration of a high dose of active ingredient. Kills phoretic mites, but does not affect subsequent generations, requiring repeated re-treatments. The high dosages required by this type of treatment are regarded as unsafe for bees and humans, and have potential to lead to bio-resistance in Varroa.



### Apivar's controlled-release treatment

Effective for an extended period of time after the administration of a single low dose of active ingredient that is released over six weeks. Kills many successive generations of mites without leaving significant residues. This treatment is completely safe for bees and humans, and has not led to any known instances of bio-resistance in Varroa.

### Apivar is safe for bees and beekeepers

Apivar's long-acting, low dose formulation means that when beekeepers handle and apply the product in accordance with instructions (specifically, the wearing of chemical-resistant gloves) they can be confident they will not be exposed to dangerous pesticides as the active ingredient does not emit vapors into the hive atmosphere — or the environment — during application. Studies have also proven that "the product had no effect

on bee mortality, size of the brood-comb, hive activity, hive weight or the size of the honey harvest when used at twice the indicated dose."<sup>1</sup> Apivar has a considerable safety margin, particularly in view of its very low risk of overdose. Consequently, Apivar can be applied when queen cells and virgin queens are present.

<sup>1</sup> EMA, [http://www.emea.europa.eu/docs/en\\_GB/document\\_library/Maximum\\_Residue\\_Limits\\_-\\_Report/2009/11/WC500010373.pdf](http://www.emea.europa.eu/docs/en_GB/document_library/Maximum_Residue_Limits_-_Report/2009/11/WC500010373.pdf) and Goodwin et al, *Effect of Apivar on the survival of honey bee larvae and adult bees*. July 2002

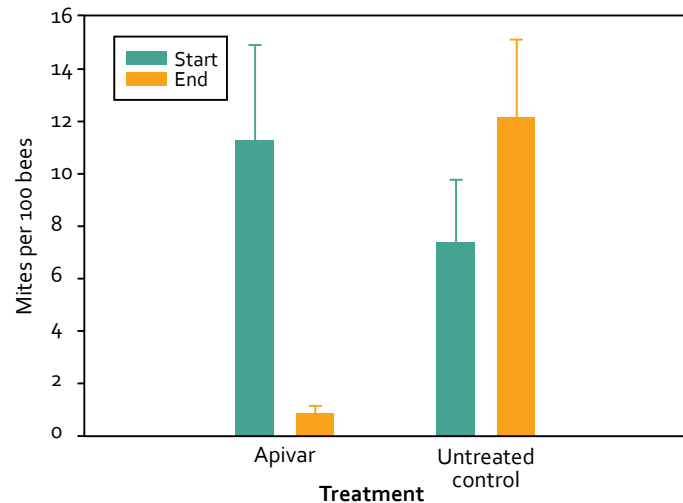
# Recent research confirms Apivar's effectiveness

The effectiveness of Apivar has been demonstrated in a number of recent research projects conducted by Canadian authorities, the United States Department of Agriculture (USDA) and other research teams.

## "Compared to control colonies, Apivar reduced mite loads significantly"

The graph below was excerpted from research<sup>1</sup> conducted by Jeff Pettis and Denis vanEngelsdorp in 2009. The chart reflects mite populations in untreated hives compared to hives treated with Apivar. The researchers concluded: "Compared to control colonies, Apivar reduced mite loads significantly."

Total mite population before and after a six-week treatment with Apivar



## Apivar tested more effective than other products

The table below is excerpted from research conducted in Edmonton, Alberta, Canada in 2008.<sup>2</sup> It shows the average efficacy of various mite treatments on a washed sample of 300-400 bees per colony. Apivar out-performed other products in this study by a considerable margin.

Efficacy of Apivar on the Varroa mite, *Varroa destructor*, in Alberta Canada

Treatment	Average Efficacy (%) (# Mites per wash sample of 300-400 bees)
Apivar	99.6% ± 1.3
ApiLifeVar	-111.2% ± 295.6
Apistan	-4.4% ± 139.3
Bayvarol	-129.8% ± 182.5
Checkmite	88.8% ± 15.3

**"Our research shows that Apivar is completely safe when used as instructed. Beekeepers can use it with confidence. *Oluptatu renihil id et as cum facerum quationseque.*"**

-- Faux Quotation from KOL

**"What I like best about this product is the fact that it is so easy to apply. It really saves us a lot of time and effort."**

-- Faux Quotation from KOL

## Apivar drives dramatic drop in mite population

A study<sup>3</sup> conducted by the research arm of the USDA in the spring of 2012 shows that Apivar was responsible for significant drop in mite population compared to an untreated hive.

According to the report: "As a rule of thumb, we consider control adequate if there is a 10-fold difference between the negative control mite levels [and the levels achieved by] a known Varroa control product. Using this guideline, the four Apivar strips gave a 52-fold drop in mite populations."

## Controlling *Varroa destructor* with Apivar

Group	Number of colonies	# Varroa remaining after 6 weeks of treatment (mites per 100 bees)
Untreated control	20	446.6
Apivar 2 strips per brood chamber	20	8.5
Positive control (0.77% amitraz grease patty)	20	41.7

**Apivar leaves no significant residues in hive products**  
Amitraz is highly unstable in the hive environment and is quickly broken down by hydrolysis. Residue trials found that:

◆ After a 10-week treatment with Apivar, no residue of amitraz was detected in honey, regardless of the date of sampling.<sup>4</sup>

◆ No active ingredient residues were detected in beeswax 24 hours after the removal of the strips from the hive.<sup>5</sup>

Similarly, other studies concluded that, following an Apivar treatment, residues of amitraz and its components in honey consistently fall below the limits of detection and below the maximum residue limits established by the European Medicines Agency.<sup>6</sup>

<sup>1</sup> Jeffrey S. Pettis and Dennis vanEngelsdorp. *Efficacy of Apivar (Amitraz) strips for Varroa mite control in Maryland*. October 20, 2009

<sup>2</sup> Nasr et al, *Efficacy of Apivar on the Varroa Mite, Varroa destructor in Alberta, Canada*. 2012 Canadian Pest Surveillance Branch, Research and Innovation Division, Agriculture and Rural Development.

<sup>3</sup> Frank A. Eischen, R. Henry Graham, Paul Rivera, and Anthony Ison. *Controlling Varroa destructor with Apivar*. Field trial 17 April – 29 May 2012.

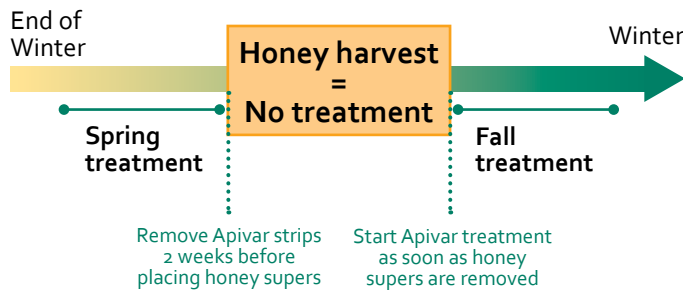
<sup>4</sup> <http://dx.doi.org/10.1051/apido:2007038> Martel et al, *Acaricide residues in honey and wax after treatment of honey bee colonies with Apivar or Asuntol 50*, *Apidologie* 38 (2007) 534–544

<sup>5</sup> [http://www.emea.europa.eu/docs/en\\_GB/document\\_library/Maximum\\_Residue\\_Limits\\_-\\_Report/2009/11/WC500010373.pdf](http://www.emea.europa.eu/docs/en_GB/document_library/Maximum_Residue_Limits_-_Report/2009/11/WC500010373.pdf)

<sup>6</sup> T.M. Trower et al, *Amitraz residues in honey and bee wax*, 2002

**"Oluptatu renihil id et as cum facerum quationseque. Renihil id et as cum facerum."**

-- Faux Quotation from KOL



Optimize the power of Apivar by scheduling hive treatments as shown above.

## Apivar treatment timing recommendations

Apivar can be used year-round, but many beekeepers treat in the spring, before the nectar-collecting period. The purpose of the spring treatment is to decrease mite populations (and reduce the risk of colony collapse) during the nectar-collecting season, thereby maximizing honey yield. The spring treatment must be completed before honey supers are installed.

Apivar can also be applied in the fall to decontaminate the colony before winter bees are produced. This will maximize the strength of the colony for wintering. Fall treatments should be initiated as soon as honey supers are removed.

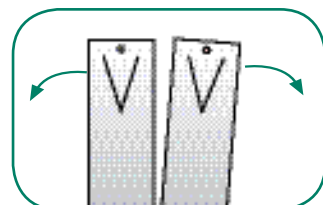
The recommended dosage is two strips per brood chamber, or as shown in the table below. Apivar is most effective when applied at the specified dosage.

Number of Frames	<5	6-10	11-15	>16
Number of Strips	1	2	3	4

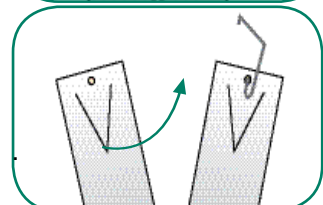
## Installing Apivar strips

Installing Apivar in the hive is easy. Just tear open the foil pouch, remove the double rigid strips, and follow these steps:

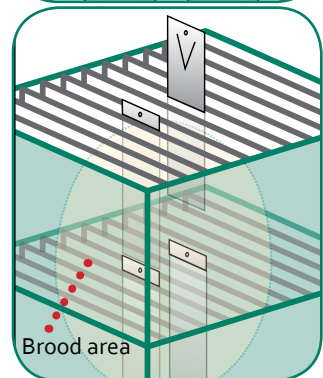
**1** Remove honey supers before applying Apivar.



**2** Separate the double rigid strips.



**3** Use the strip's die-cut triangle as a hanging hook.



**4** Hang each strip between two comb frames in the brood area or the bee cluster, with a minimum distance of two frames between strips. Suspend Apivar strips in the brood chamber so bees can walk on both sides of the strips.

**5** Leave strips in the hive for 42 days minimum and then remove. **DO NOT re-use the strips.**

### Reposition the strips for optimum results

If the bee cluster moves away from the strips, reposition the strips into the bee cluster, and leave them in place for 14 more days before removal. Strips must be removed after a maximum of 56 days.



Quality control and assurance are cornerstones of the complex processes used in the manufacture of Apivar strips.

## Formulated by beekeeping experts for beekeepers

Apivar is a product of Véto-pharma, a French pharmaceutical company that develops and markets innovative products to help commercial and hobbyist beekeepers prevent and control hive diseases and infestations. All Véto-pharma products are developed and manufactured in compliance with applicable pharmaceutical standards.

Apivar was first formulated in 1995 and has been manufactured in a dedicated facility operated to the highest standards in pharmaceutical manufacturing. The facility's processes are dedicated entirely to animal health product manufacturing in compliance with GMP<sup>1</sup> standards. The facility is also regularly inspected by the French National Agency for Veterinary Medicinal Products.

Véto-pharma's manufacturing process is designed to maintain strict control of raw materials, packaging materials, intermediates, and finished products. This control is supported by an exhaustive, on-going analysis and testing process, and provides full validation of processes and methods to guarantee batch consistency and reproducibility. As a result, beekeepers around the globe can be confident that each Apivar strip is consistent, safe for bees and humans, and meets or exceeds stringent pharmaceutical quality standards.

Véto-pharma is dedicated to developing products that benefit bees and beekeepers. Our passion for bees and the benefits they bring to our world is reflected in our good relationships with beekeepers and beekeepers' organizations all around the globe. For more information about future Véto-pharma bee and beekeeping products, visit our website at [www.apivar.net](http://www.apivar.net).

<sup>1</sup> The facility operates in accordance with European Union (EU) Good Manufacturing Practice (GMP) guidelines for Veterinary Medicinal Products (Directive 91/414/EEC). GMP is a EU standard that is approximately equal to the pharmaceutical manufacturing standards required by the US Food and Drug Administration and the US Environmental Protection Agency.