

**Parasite control
for bee colonies:
Bayvarol[®], Perizin[®]
and CheckMite+[®]**



Bayer HealthCare
Animal Health

www.animalhealth.bayerhealthcare.com

Bayvarol[®]

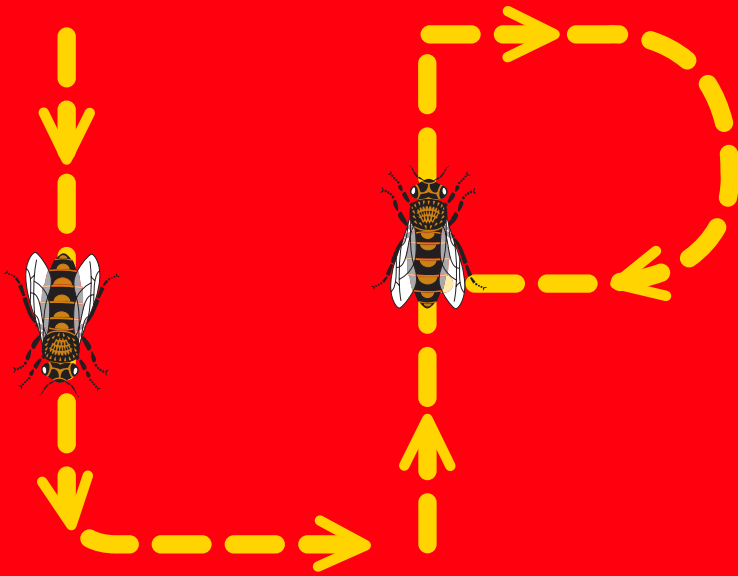
The Varroa Treatment.

Perizin[®]

Mite Diagnosis and Treatment.

CheckMite+[®]

The Effective Mite Control.



Treatment of bee diseases.

Certain types of diseases affecting bee colonies can be controlled with bio-technical or beekeeping measures. However, there can be serious consequences if a certain damage threshold is exceeded. In such cases, it is critically important to promptly use recognised, reliable medicines. Indeed, in many countries there are legal regulations governing the treatment of bee disorders, many of which must be reported to the authorities.

Three effective treatments from Bayer.

Bayer offers three effective medicines for treating infestations of Varroa mites (*Varroa destructor*), which are found around the world. The different active ingredients and formulations enable these treatments to be integrated in a wide range of pest control programmes.

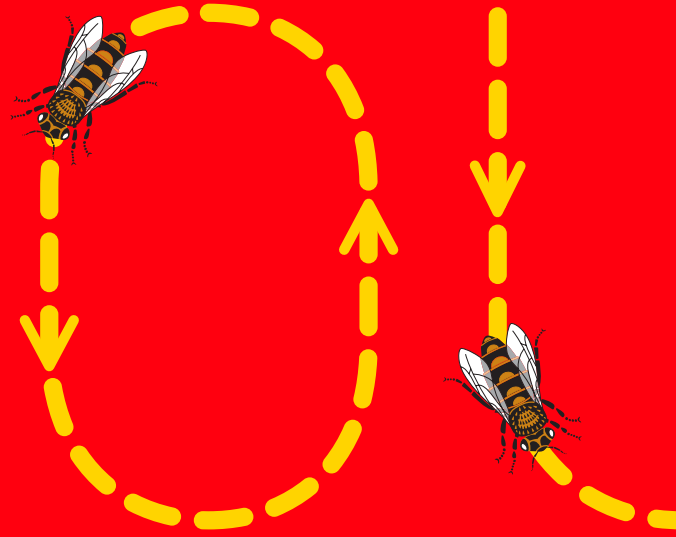
Bayvarol[®], Perizin[®] and CheckMite+[®].

Bayvarol[®], Perizin[®] and CheckMite+[®] provide beekeepers with a broad-based programme for treating Varroa infestation. Furthermore, CheckMite+[®] is an effective treatment against the small hive beetle (*Aethina tumida*).¹

But regardless of what medicine you use, all of these treatments have been developed to be completely effective using the lowest possible amount of active ingredients. Used properly they are almost 100% effective. Not only are they effective, they also don't pose any threat to bees or the users.

The advantages are clear: your colonies stay healthy and strong, helping them sustain good honey production without any dangerous residues in the honey.

¹ PJ Elzen, JR Baxter, D Westervelt, C Randall, KS Delaplaine, L Cutts, WT Wilson (1999): Field control and biology studies of a new pest species, *Aethina tumida* (Coleoptera, Nitidulidae), attacking European honey bees in the western hemisphere. *Apidologie* 30, 361-366.



Varroa mites can destroy entire populations

For years now, the mite *Varroa destructor* has plagued bee colonies in many parts of the world. Indeed, infestations of this mite have now become an epidemic of global proportions, threatening to destroy entire populations of honey bees in the Western world. There are only a few treatments available to control this pest.

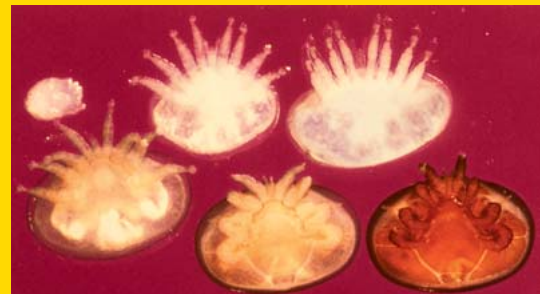
The Varroa mite.

For thousands of years, Varroa mites have been parasites on the Asian honey bees *Apis cerana*, giving this species the opportunity to learn to live with the mites. Unfortunately, the European honey bee (*Apis mellifera*) did not have any time to adapt to this pest, which was accidentally introduced in Europe by international trade in 1977 and then later in North Africa, America and New Zealand as well. Scientists have intensively studied this parasite. They have researched the biology of the mites, its potential as a vector for disease and

specific approaches to control. This, in turn, has led to the development of effective, safe medicines the strategic use of which has helped to prevent even greater damage to honey bee populations.

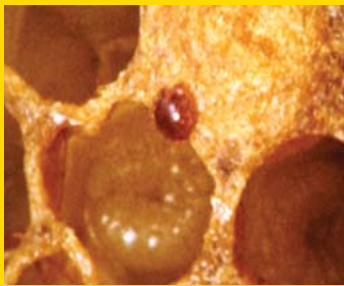
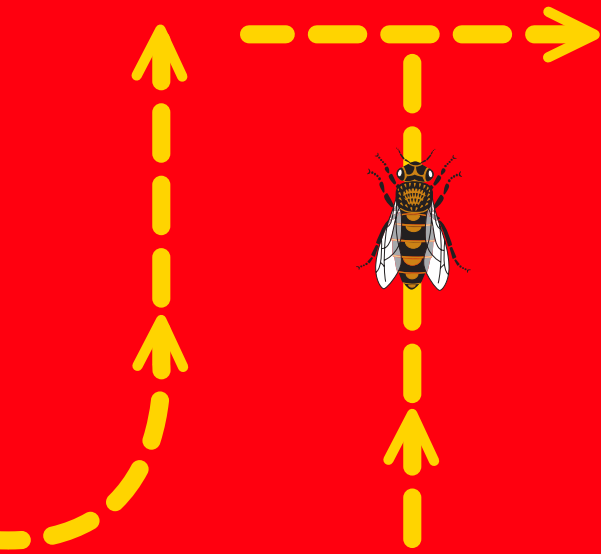
Development of the Varroa mite.

The development of this reddish-brown mite is perfectly adapted to the lifecycle of the honey bee. Female mites (foundresses) have a flat-shaped body roughly 1.6 mm wide and 1.1 mm long, allowing them to fit between the overlapping abdominal segments, where they feed on the bees' hemolymph.



Stages in the development of *Varroa destructor*

The foundresses enter the brood cell shortly before the cell is capped, preferring to infest drones. This is an effective



Bee pupa infested with Varroa mites



Varroa mites damage a bee larva



Adult bee with Varroa mite

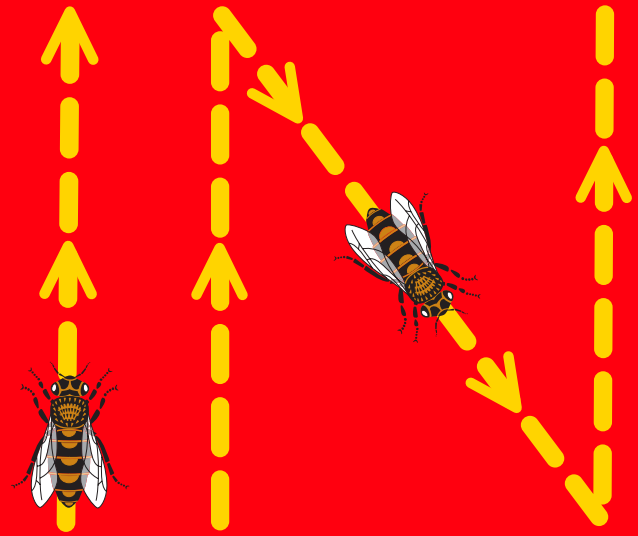


Enlarged picture of the 8-legged mite *Varroa destructor*

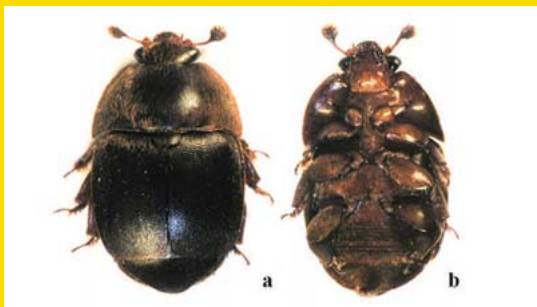
strategy as the roughly three-day additional development period of the drones provides the mites with extra time to reproduce. In the brood cell, the mite feeds on the hemolymph of their hosts, after which it lays its eggs. The eggs develop into young mites in the closed cells and then mate. Following this, the female offspring then leave the cell with the young bees and seek a new host to continue to the cycle of reproduction.

Double damage.

Varroa mites not only cause significant damage to the bees by feeding on their hemolymph, but also act as a vector for viral diseases like Acute Paralysis Virus (APV) and Chronic Paralysis Virus (CPV). The wounds inflicted by mites may also be contaminated with bacterial or fungal organisms. These secondary infections can be recognized based on typical symptoms associated with them and often lead to severe damage to the colony. In order to prevent this, it is crucial that colonies are monitored for Varroa infestation regularly and that measures to control the infestation are taken when necessary.



The small hive beetle - a new threat to bee colonies



The small hive beetle - *Aethina tumida*

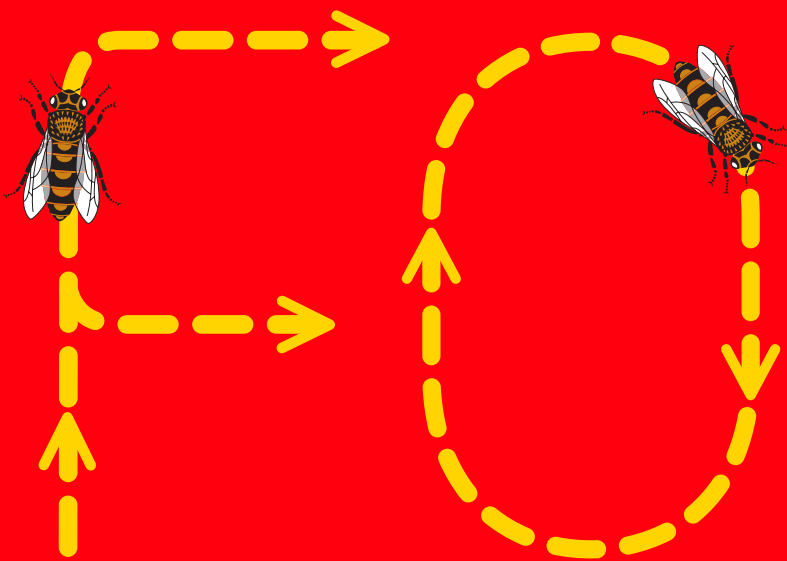
The small hive beetle *Aethina tumida* is originally from sub-Saharan Africa, but has spread to other regions in recent years, in particular North America. Unfortunately, this pest is also expected to spread to other countries as well.

The beetle and its larvae can cause massive damage to the combs. The beetle can fly long distances and is able to locate and target colonies at great distances, using the chemical scents emanating from the combs.



Larva of the small hive beetle - *Aethina tumida*

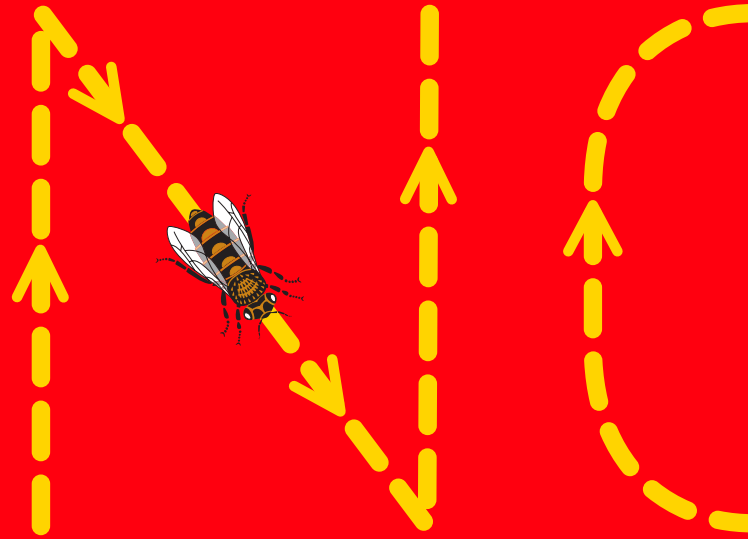
In the hive, the beetles mate and lay their eggs in cracks and niches inside and outside the hive. After 2 to 6 days the larvae emerge. The voracious beetle larvae and the adult beetles both feed on brood, honey and pollen.



Adult small hive beetle *Aethina tumida*

After 2 to 3 weeks the larvae leave the hive and dig into the ground to a depth of 20-40 cm in the surrounding areas. In the following three to four weeks a

new generation of beetles develops and emerges to seek new bee colonies to attack. Bee colonies are destroyed in a very short time.



Bayvarol[®]: Test first, then treat

The best time to treat the colonies with Bayvarol[®] for Varroa infestation is after the last honey flow and the honey harvest. Bayvarol[®] strips are impregnated with Flumethrin, a synthetic pyrethroid, which is highly effective in combating the Varroa mite and at the same time harmless to the bees.



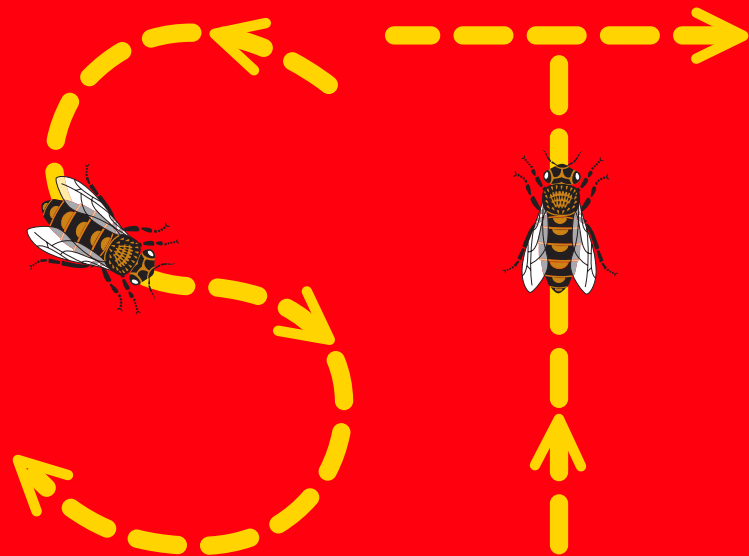
Easy to use: Bayvarol[®] Strips

The test: following the honey harvest.

Prior to treatment, you should first check to determine the extent of the infestation with Varroa mites. To do so, lay a clean cloth (floor sheet) on the bottom board. Following this, hang up the Bayvarol[®] Strips. Check the floor sheet after 24 hours. This will provide a clear picture of the extent of the mite infestation.

The treatment: strip by strip.

For normal colonies hang up four strips. For weakened colonies, new colonies and young colonies, which are not yet using more than one-half of the combs, two strips are sufficient. Hang up the strips between the brood combs. Make sure that the bees can climb onto both sides of the strips: this is important as it ensures that an adequate amount of the active ingredient will be distributed amongst the bees. This occurs evenly throughout the hive through social contact.



Perizin[®]: Immediate effect

Towards the end of the year, when there are no longer any brood in the colony, is the right time to treat the hive with the varroacide Perizin[®] (active ingredient: Coumaphos). This treatment destroys the entire mite population, helping to prevent problems in the spring. Perizin[®] can also be used to determine the initial extent of the mite infestation. Indeed, just performing the test constitutes half of the treatment.



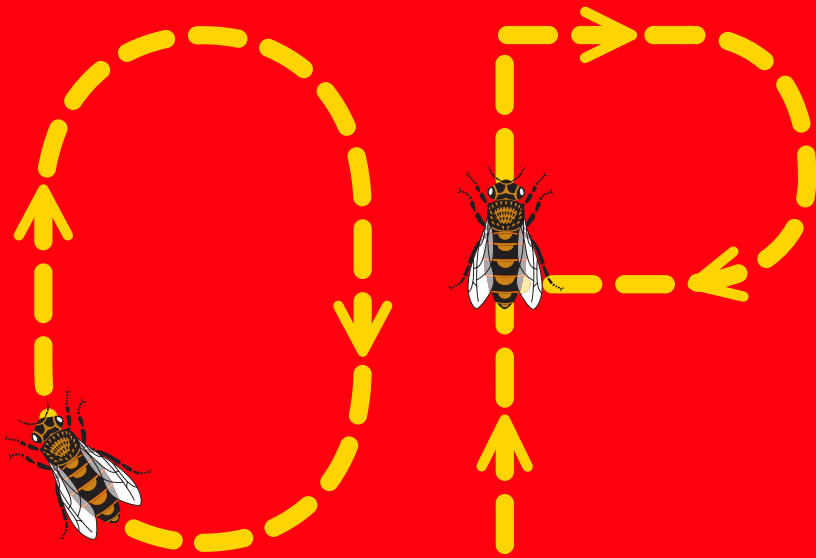
Diagnosis and treatment with Perizin[®]

Very practical: the test.

A single treatment with Perizin[®] is sufficient to determine the extent of the infestation with Varroa mites. Prior to treatment place a clean sheet on the bottom of the hive and check it one day later. If you find dead mites on the sheet, the diagnosis is clear. In this case, you should treat all the colonies in the apiary twice at one week intervals.

Incredibly easy: applying the treatment.

You can prepare the ready-to-use emulsion for trickling on the bees using the handy set. Trickle 10 – 50 ml of the solution, depending on the size of the colony. That's it. The rest of the work is done by the bees themselves. They consume the emulsion and spread it by social feeding contact throughout the entire colony. The active ingredient enters the bees' hemolymph through the digestive tract. And when the mites feed on the hemolymph they get a deadly dose that kills them off.



as the colony is not too old or already seriously damaged. Normally, this level of mortality does not pose a threat to the colony. Perizin® is also well-suited for use with new colonies shortly after they have formed

Highly safe: the effect.

The amount of active ingredient consumed by the bees is not dangerous to the bees themselves, but is enough to kill the mites. When using Perizin® it is important that the outdoor temperature is not lower than +5 °C, because this can lead to excessive cooling of the bees resulting in death. In general, a modest mortality rate of roughly 50 bees can be expected when Perizin® is used, as long



Perizin®. * **Active ingredient:** Coumaphos. **For animals:** bees. **Composition:** 1 ml solution contains 32 mg of Coumaphos (0,0'-Diethyl-0''-(3-chlorine-4-methyl-7-cumarinyl)-thio-phosphate). **Area of application:** for diagnosing and combating (therapy) varroa mites in bees. **Contraindication:** Perizin® may not be used during foraging periods. If used in spring, the therapy must be completed six weeks before foraging begins. Do not use for treatment when the temperature is below +5° C. **Side effects:** Perizin® is a medicine specifically for bees, which has been optimized in extensive laboratory and field trials to be effective and compatible. At the recommended, no side effects can be expected. However, the treatment can cause a few bees to die at low outdoor temperatures. This is caused by bees getting wet and then excessively cooled and will not impair the development of the colony as a whole. **Special precautions to be taken by the person administering the product:** Perizin® is for external use only and may not be ingested by humans or other vertebrates. Avoid direct contact with skin, mucous membranes and eyes. If there is accidental contact (mucous membranes, eyes) rinse thoroughly with water. Wear protective gloves when using the product. Do not eat or drink when using the product. After handling the product, wash hands thoroughly. Keep out of reach of children. **Antidote:** When using appropriately there is no danger of intoxication. In case of poisoning inject atropine sulphate 1% solution i.m.. **Dosage (man):** 0.2-0.5 ml. Repeat injection of atropine sulphate when action of atropine diminishes and the poisoning symptoms (pupil contraction, muscle trembling, vomiting, diarrhoea) worsen. **Waiting period:** 1. The waiting period between the diagnostic or therapeutic use of Perizin® and the start of foraging flights amounts to six weeks or 42 days. 2. If used less than six weeks before the start of foraging, the honey then obtained may not be used for human consumption or fed to other bees. **Sold only by pharmacies.** Bayer HealthCare AG, D-51368 Leverkusen, Germany, www.animalhealth.bayerhealthcare.com

* Not registered in every country. The pharmaceutical regulations of the individual countries are to be followed when the products are used.



CheckMite+[®]: No chance for resistance

Thanks to CheckMite+[®] Varroa mite infestations can be effectively kept under control. Moreover, CheckMite+[®] has also proven effective as a method for controlling the small hive beetle.¹



Treatment of small hive beetle infestation with CheckMite+[®]

Studies show: highly effective.

Current studies¹ have once again substantiated the outstanding effect of this treatment method: just 48 hours following the start of the treatment, 85-90% of adult small hive beetles and 94% of their larvae are dead. Furthermore, this treatment also provides excellent control of Varroa mites, killing up to 100% of them as attested by various studies¹.

For mite infestation: just hang them up.

Not only are CheckMite+[®] Strips light, they are also easy to use. Just hang up the 2.5 cm x 22.5 cm plastic strips between the combs. One strip is enough for five combs in the broodnest area. All colonies in the vicinity should be treated at the same time. Accordingly, use of CheckMite+[®] is primarily recommended

¹ PJ Elzen, JR Baxter, D Westervelt, C Randall, KS Delaplane, L Cutts, WT Wilson (1999): Field control and biology studies of a new pest species, *Aethina tumida* (Coleoptera, Nitidulidae), attacking European honey bees in the western hemisphere. Apidologie 30, 361-366.



in the spring prior to the first foraging or in the autumn after the last honey harvest.

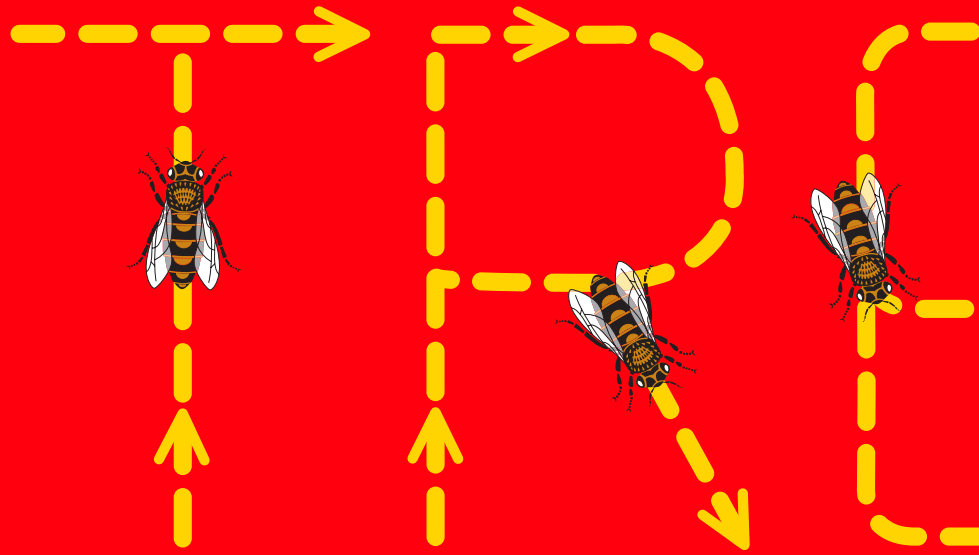
For beetle infestation: just lay them in. Using CheckMite+® strips to control beetle infestation is similar to the method employed for Varroa mite control, but there are important differences. Prior to use, remove the honey combs and only reinsert them 14 days after the strips have been removed. Cut a strip into two

halves and stick these to a piece of cardboard (see Diagram bottom left). Place this on the middle of the floor board and attach it with adhesive tape so that the bees cannot eat it or remove it. The strips should be facing downwards. Leave this in the hive for a minimum of 42 days and a maximum of 45 days. The timing of the treatment is the same: prior to initial honey flow in the spring and following the last honey harvest in the autumn. Do not treat the hives more than four times per year for beetle infestation and do not use the strips when the bees are producing surplus honey.



CheckMite+®.* Antiparasitic agent for the therapy against the infestation with varroa mites for bees. Veterinary use only. **For animals:** bees. **Composition:** One strip of 13.6 g contains 1.360 g Coumaphos. **Indications:** CheckMite+® 10% strips for bees applied for 42 days between frames in the broodnest area are highly efficacious against *Varroa destructor*. **Contraindications:** Do not use in queen rearing colonies. **Posology and Method of Administration:** For use in beehives only. Use 2 CheckMite+® 10% strips for each bee colony. Hang the strips within two combs in the broodnest area for 42 days. Treat all infested colonies within yard. Most effective control may be achieved by treating hives in the spring before the first honey flow or in the fall after the last honey flow. Data indicate that use during honey flow season does not cause residues in honey chamber above the MRL. **Major Incompatibilities:** None known. **Storage:** Do not store under direct sunlight. The shelf life is 36 months. **Special precautions to be taken by the person administering the product:** Avoid contact with the skin. Do not eat or drink during the application. Keep away from food, feed and drinking water. Keep out of reach of children. Wash hands after handling the product. In case of poisoning call a doctor and make the label available to him. **Antidote:** When using appropriately there is no danger of intoxication. In case of poisoning inject atropine sulphate 1% solution i.m.. Dosage (man): 0.2-0.5 mL. Repeat injection of atropine sulphate when action of atropine diminishes and the poisoning symptoms (pupil contraction, muscle trembling, vomiting, diarrhoea) worsen. **Packaging:** 10 strips per aluminium sachet. **POM. MAH:** Bayer HealthCare AG, D-51368 Leverkusen, Germany, www.animalhealth.bayerhealthcare.com

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Successful help for the bee colony and nature

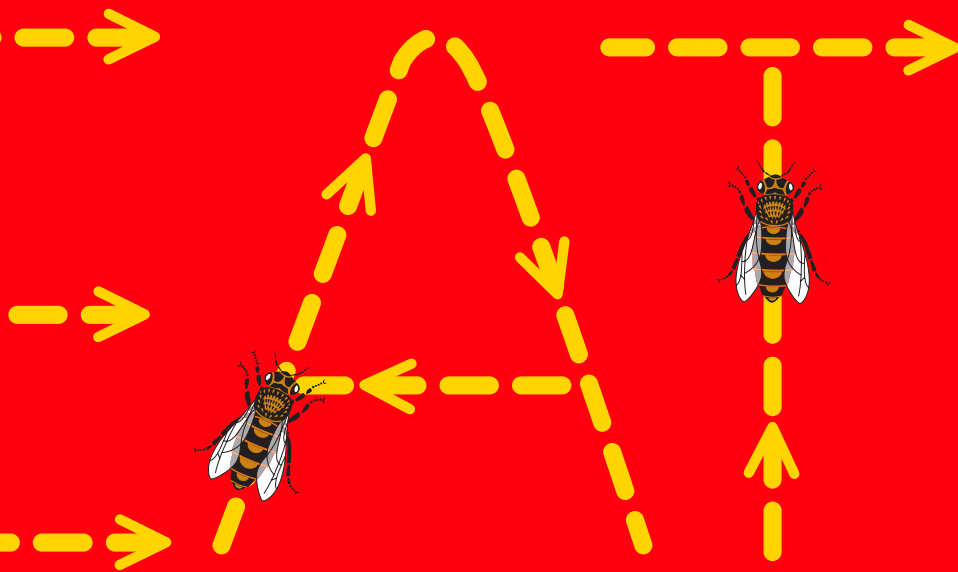
Bayvarol[®], Perizin[®] and CheckMite[®]: success in many respects.

Honey: a natural product.

Healthy, strong bee populations are a key prerequisite for bountiful production of honey, because with proper use, the honey remains free of residues even when chemical preparations are em-

ployed. With this in mind, Bayvarol[®], Perizin[®] and CheckMite+[®] were developed to ensure that the minimum amount of active ingredient is used (see above), while at the same time aiming to ensure that the treatment is almost 100% effec-





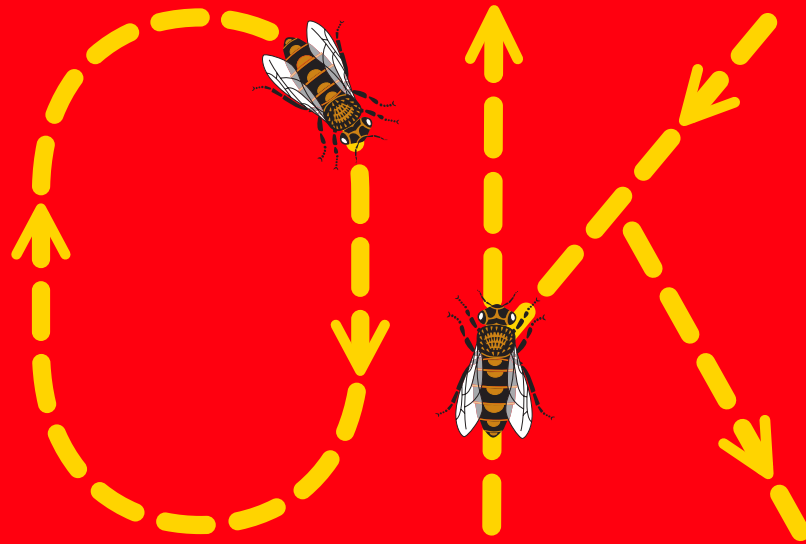
tive. These three veterinary medicines are highly effective against these parasites, and yet pose no threat to bees or users.

Bees: working to sustain nature.

Vigilance and effective control of parasite infestations affecting honey bees can help ensure your economic success, and also guarantees that you make a vital contribution to the pollination of crops and the natural diversity of wild plants through your work as a beekeeper.

Bayvarol®, Perizin® and CheckMite+® offer tried and trusted treatments to combat parasite infestations. Use these three products within the framework of an integrated parasite control strategy to protect the health of your bees.





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This brochure in English is intended for international use only.

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