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USE OF ECOSTOP AGAINST VARROA IN ORGANIC BEEKEEPING

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INTRODUCTION

- ❑ According to Reglament 889/2008 EU and legislation of Bulgaria in the organic beekeeping are enjoined specific orders concerning prevention and veterinary treatment.
 - ❑ Only veterinary medical products (VMP) authorised by the relevant services in accordance with EU or national legislation can be used.
 - ❑ Organic beekeepers are held to a strict set of standards to ensure the health of the hive and to respect the bees.
 - ❑ In order for a hive to be certified organic there are some main rules to which the beekeeper must adhere.
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INTRODUCTION

- ❑ Organic Beekeeping methods include treatments using natural materials, and must not promote the use of any substance which is harmful if handled or eaten by honeybee or bee keeper (Thiele, 2003).
 - ❑ In the case of invasion of Varroa destructor can be used the natural products like organic acids, and menthol, thymol, eucalyptol or camphor (Rademacher, 1996; Rademacher et al., 1999; Imdorf et al., 2004).
 - ❑ Due to the biology of host and parasite, different treatment methods are required during the year (Concept of Integrated Varroa Control).
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EIM

- The present investigations aim was to establish the effectiveness of **Ecostop** against Varroa at clinical trials on bee colonies and compared it with other acaricidal products.



MATERIALS AND METHODS

Ecostop is a veterinary medical product (VMP) with active substances: 5.0 g of thymol and 2.0 ml of mint oil, that was offered as a solid aerosol with prolonged release of the ingredients, suitable for organic beekeeping.

Ecostop has been manufactured by “**Primavet – Sofia**” Ltd., Bulgaria, since 2002 for treatment against varroosis disease in honey bees.



MATERIALS AND METHODS



The investigations were carried out during the autumn of 2009 on 40 beehives at a ordinary apiary in the region of Plovdiv and during spring of 2010 on 30 bee colonies at a test apiary of IAC, Kostinbrod.

The bee colonies were treated with **Ecostop** Varostop, Perizin

MATERIALS AND METHODS



Plovdiv

Autumn treatment 2009:

Group I: 10 bee colonies with strength of $1,850 \pm 0,19$ kg were treated with 2 plates of Ecostop for 45 days.

Group II: 10 bee colonies with strength of $2,75 \pm 0,13$ kg were treated with 2 strips of Varostop (3.6 mg of flumethrin in a single strip) for 45 days.

MATERIALS AND METHODS



Group III: 10 bee colonies with strength of $2,250 \pm 0,08$ kg were treated once with Perizin (coumaphos).

Group IV /K/: 10 bee colonies with strength of $2,000 \pm 0,14$ kg remained untreated.

MATERIALS AND METHODS



Spring treatment 2010:

Group I: 10 bee colonies with strength of $2,35 \pm 0,11$ kg were treated with 2 plates of Ecostop for 45 days.

Group II: 10 bee colonies with strength of $2,20 \pm 0,18$ kg were treated with 2 strips of Varostop (flumethrin) for 45 days.

Group III /K/: 10 bee colonies with strength of $2,35 \pm 0,18$ kg remained untreated.



IAC

MATERIALS AND METHODS

- ❑ The changes in the numbers of the mites fallen were determined within the trial groups on the 7th, 14th, 21st, 28th, 35th, 42nd, and 45th days.
 - ❑ In order to obtain a more comprehensive and complex evaluation of the effectiveness of **Ecostop** the EI /Extensinfestation/ of trial and control groups before and after the treatment was determined.
 - ❑ The acaricidal activity of the products was established via control treatment of the trial and control groups with control acaricidal VMP by determination of the number of mites fallen. The control products were applied on the 46th day for all groups.
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MATERIAL AND METHODS

- The following formula was used to estimate the percentage of mites killed by the experimental and control treatments:

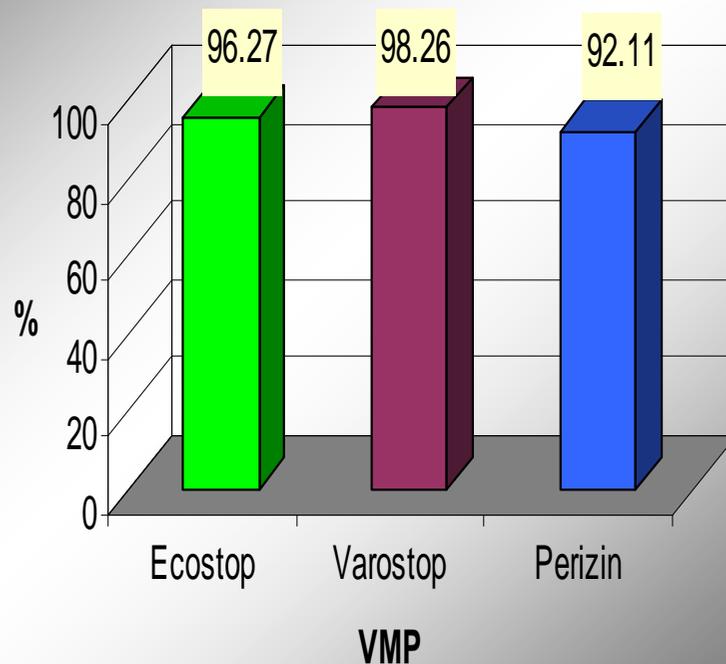
$$\text{Efficacy of test VMP (\%)} = \left(\frac{\text{tVMP}}{\text{tVMP} + \text{cVMP}} \right) \cdot 100\%$$

Where: tVMP = number of mites killed by test VMP
and cVMP = number of mites killed by control treatment.

- The colony strength for all groups was evaluated by measuring the quantity of bees in “kg” and by counting the number of cells with sealed brood. Both types of groups – controls and trials were compared before and after treatment. Behavioural changes in the bees or brood during the treatment were visually established.
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RESULTS

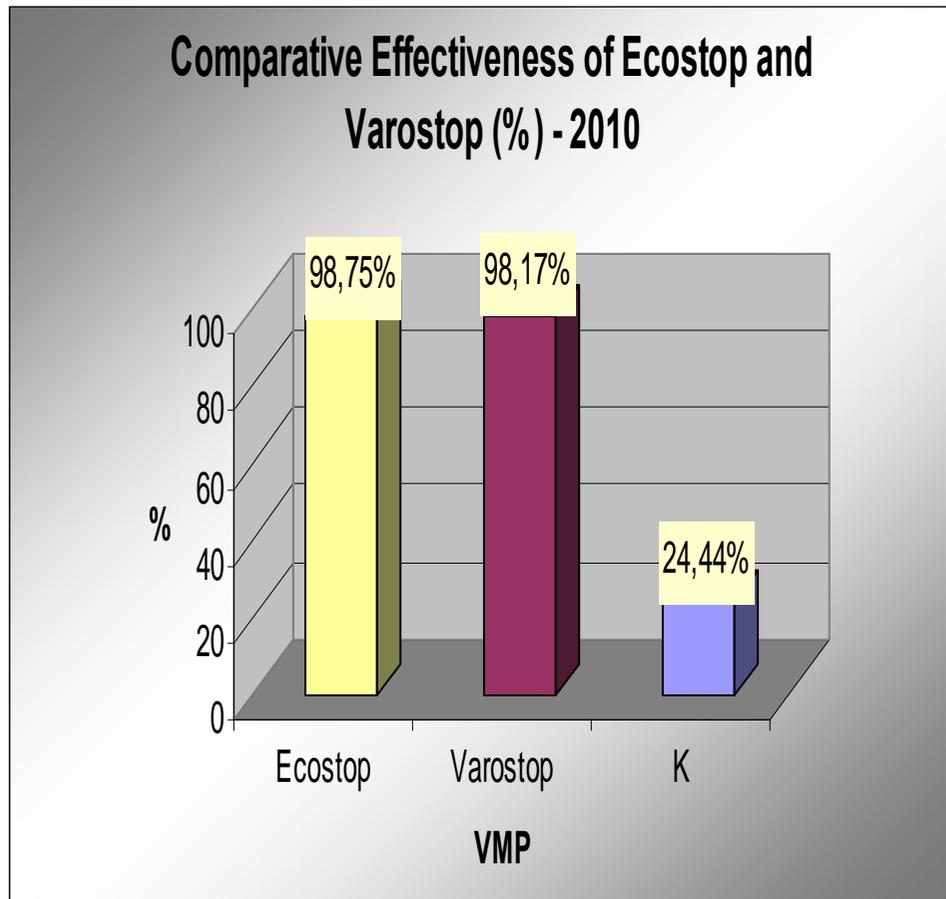
Comparative Effectiveness of Ecostop, Varostop and Perizin (%) - 2009



Effectiveness during autumn treatment 2009:

- Ecostop with 2 plates for 45 days – $96,27 \pm 1,09\%$
(Min-Max: 90,53–100,00)
- Varostop with 2 strips for 45 days - $98,26 \pm 0,98\%$
(Min-Max: 95,31– 100,00)
- Perizin - $92,11 \pm 7,89\%$
(Min-Max: 88,96–100,00)

RESULTS



During the spring Treatment 2010:

- Ecostop - $98,75 \pm 0,35\%$ (Min-Max 96,3 – 100,00) with 2 plates for 45 days
- Varostop - $98,17 \pm 0,62\%$ (Min-Max 94,52 – 100,00) with 2 strips for 45 days



RESULTS

- During the course of the experiments conducted, a greater number of mites has fallen in the trials groups treated for 45 days in comparison with the one that was untreated.
 - This fact showed that Ecostop plates should remain in the bee nest at least for 45 days in order their acaricidal effect to be manifested.
 - The similar number of mites has fallen among the bee colonies that were treated with Varostop.
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DISCUSSION

- ❑ The effectiveness of Ecostop in both of the apiaries were comparable with other acaricidal products like pyrethroids. When Ecostop was properly applied no adverse influences upon the bee colonies were observed.
 - ❑ This confirmed our statement that the treatment should continue for at least 45 days in order to eliminate a sufficient percentage of the mites so they could not cause harm to bee colonies.
 - ❑ Our results confirm the data of the other authors who got 95–98% effectiveness during treatment with Api-Life-Var (Abou-Zaid et al. 1993; Moosbeckhofer 1993; Imdorf et al. 1994, 1995, 2004; Thiele, 2003).
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CONCLUSIONS

- Ecostop has manifested good effect against Varroa - $96,27 \pm 1,09\%$ (Min-Max: 90,53–100,00) in autumn and $98,75 \pm 0,35\%$ (Min-Max 96,3–100,00) in spring when applied in a dose of 2 plates to colonies with strength within $2,25 \pm 0,08$ kg - $2,35 \pm 0,11$ kg.
- Varrostop in a dose of 2 strips applied in colonies with strength between $2,20 \pm 0,18$ kg - $2,75 \pm 0,13$ kg manifested effectiveness $98,17 \pm 0,62\%$ (Min-Max 94,52 – 100,00) in autumn and $98,26 \pm 0,98\%$ (Min-Max: 95,31– 100,00) in spring treatment.



CONCLUSIONS

- ❑ The results obtained provide good reasons to consider this product a suitable means against varroosis disease under the conditions in the Republic of Bulgaria, due to its proven effectiveness when applied during fall and spring treatments.
 - ❑ Ecostop will supplement the limited spectrum of VMP against Varroa at the apiaries with organic apiculture and it will provide the apiarists the opportunity to produce bee honey without remnants of chemically based acaricidal agents that are harmful to humans.
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ECOSTOP



ЕКОСТОП®
Биологичен продукт
за профилактика и лечение
на вароатозата при пчелите

Действие:
С препаратите "Екостоп" активно действащите съставки Тимол и Ментово масло, включени в Екостоп - плочки се отделят под формата на пари и оказват своето лечебно действие продължително време.
Парите на Тимол и Ментово масло притежават акарицидно действие спрямо причинителя на Вароатозата по пчелите, акарът *Varroa*. Фумигацията на пчелите с тях води не само до отпадане на акарите, но и увеличава продължителността на живота на болните пчели.
Тимолът и Ментовото масло притежават бактерицидни свойства, което води до значително намаляване на микробната обсемененост на пчелните семейства.

BEEKEEPING IN HARMONY WITH NATURE



THANK YOU

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ATTENTION!

