

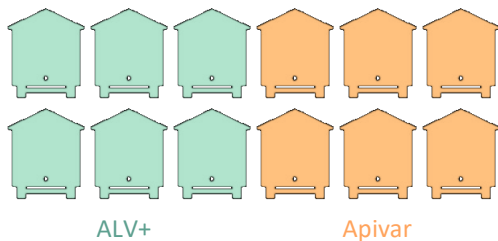
Apivar™ (Veto-Pharma) Field Trial



In the fall of 2018, the Bee Informed Partnership (BIP) conducted a field trial at the request of **Veto-Pharma** to test the effectiveness of the product Apivar™ to reduce *Varroa* mite infestation in colonies from active commercial beekeeping operations in the US.

The trial was conducted within 2 commercial beekeeping operations from 2 different geographic regions. A total of 72 colonies (12 colonies per yard, in 3 yards for each operation) were followed over 42 days after treatment. In each yard, half of the colonies were treated with Apivar while the other half received a positive control product, Apilife Var (ALV+).

The study design



x 3 yards

x 2 operations/regions: Oregon and Michigan

Day	0	7	14	21	42
Inspection	x	x	x	x	x
Brood Area	x		x		x
Product Application					
- Apivar	x				
- Apilife Var	x	x	x		
Sampling					
- Alcohol wash (lab)	x	x	x	x	x

Treatment effectiveness

Effectiveness (sometimes called field efficacy) is the target of studies which focus on how treatments (already proven successful under ideal conditions) will work in the real world.

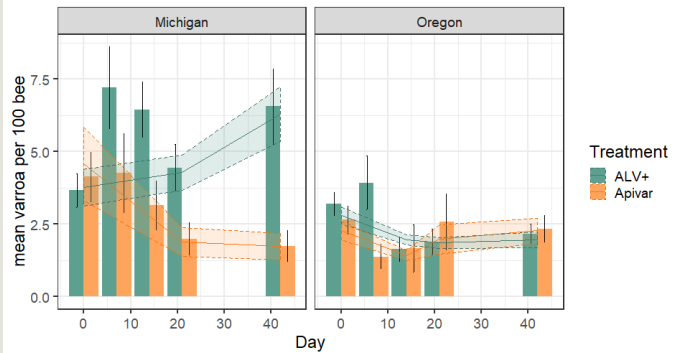
We consider a treatment effective that demonstrated a significant reduction in the infection load over time.

Varroa load was estimated by a lab wash of a sample of ~300 adult bees collected from a brood frame (reported as number of mites per 100 bees).

Why no negative controls?

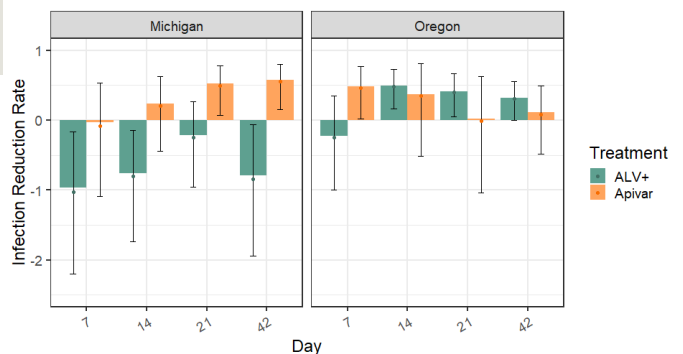
It is common practice in epidemiological studies, when the absence of treatment is known to be damaging, that negative controls are foregone for ethical reasons. Given the impact of an uncontrolled *Varroa* infestation, we felt we could not ask our participants to leave part of their operations untreated. It does limit the conclusions that can be made from a study.

Change in *Varroa* load over time



The bar graph represents the average *Varroa* load observed, while the ribbons display the predictions of our model.

Relative change in *Varroa* load over time



The reduction rate put the change in *Varroa* in relation with the starting load. Zero means no change; +1 means a complete cure; -1 means the load doubled compared to the start of the trial.

Apivar was associated with a significant **decrease in *Varroa* load over time in Michigan, but not in Oregon.** Eight of the 18 colonies (44.4%) treated with Apivar in Michigan ended the trial with loads below 1%. The average reduction rate was 57% of the starting load. In Oregon, only 5 out of the 18 colonies (27.8%) treated with Apivar ended the trial with loads below 1%. The average *Varroa* load was 2.6% at the beginning and ended at 2.4% after 42 days.

Apilife Var was associated with a very marginal decrease in *Varroa* load in Oregon, but a significant increase in Michigan.

The **starting load** and **brood area** were influential on the treatment effectiveness but not enough to explain the differences between regions.

In summary, the trial showed strong regional patterns in the field effectiveness of the two treatments tested.

We do not know why Apivar appeared less effective in one region compared to the other. Factors impacting the effectiveness of a treatment in the field could be environmental and/or associated with management differences.