

Why did my bees die?
I did all the right things!



What did I do “right” before winter?

- The queens were young and marked yellow for 2017
- There were plenty of frames with capped honey above the cluster
- The volume of bees appeared to be reasonable
- Mite treatment was applied in early spring and again in late July
- The hives were in full sun
- Ventilation was adequate
- Fed syrup to keep the queens productive and bee numbers up
- Protein supplement was available
- All frames of comb were less than 4 years old
- There was no evidence of Foulbrood, Nosema, Chalkbrood, Sacbrood, or other common viral diseases

But my hives died anyway!

Observations:

- Lots of dead bees on the screen bottom board
- A small cluster with marked queen
- Some brood – normal for January
- No observable indication of brood disease
- Hives had done well all summer and into December
- Protein patty was untouched
- Top super was full of capped honey
- Middle super had capped honey and uncapped nectar
- Capped honey was in the frame with the dead cluster

The big picture



Lots of bees, but they are all dead. The queens are circled.

Queen and head-down bees with capped brood



The other hive's queen



Starvation with nectar inches away



So why did my bees die when I “did all the right things?”

- It was a really cold and brutal winter with weeks of below freezing temperatures
- Chemical companies are evil
- My queens were no good
- Yellow jackets were bad this past year
- Neonicotinoids are in everything
- Feeding sugar is not good for bees
- Colony Collapse Disorder - CCD
- Pesticides in the environment
- Cell phone towers
- Insert other reasons here.....

Let's zoom in a bit



Did my mite treatment fail?

Could temperature be the issue?

- See www.beeculture.com/thymol-varroa-control for complete article by Claudia Garrido.
- Thymol is one of the alternative treatments in late summer, or even in spring according to the temperatures of the year or area.
- Like formic acid, thymol acts by its vapors. The bees distribute them in the hive by their activity, like ventilation or removal of the product. In addition, the external temperature is important: the efficacy is highest when the temperature ranges between 15-30°C (59-86°F) and never falls under 12°C (54°F). The ideal range for thymol treatments is 20-25°C (68-77°F). The most widely used and popular products all over Europe with thymol as a main ingredient are: Apiguard, ApiLifeVar and Thymovar.

- Apiguard is a gel with thymol, while the other two products are strips saturated with it. ApiLifeVar is a blend of thymol with eucalyptol, menthol and camphor, while Apiguard and Thymovar rely on pure thymol.
- From all three products, ApiLifeVar was the most independent from environmental conditions. The efficacy remained over 90% at all sites. This may be due to the different composition of this product: differently to the other two, it is a blend of thymol with menthol, eucalyptol and camphor.
- An interesting property of this blend is that it remains liquid at colder temperatures. Pure thymol is solid until a temperature of 49-51°C (105-124°F), therefore also under hive conditions of 35°C (95°F). Mixing thymol with other aromatic substances decreases its melting point (i.e. when it becomes liquid). Both solid and liquid thymol can pass to the gaseous stage, which is necessary to reach the *Varroa* mites on the bees.