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Varroa destructor remains a major entomological and ecological threat to Apis mellifera colonies worldwide. As an obligate ectoparasite, it compromises bee health directly through feeding and indirectly by vectoring viral pathogens. Climate change, particularly warmer winters, is exacerbating the issue by promoting continuous brood cycles in many regions. This shift undermines the timing and efficacy of traditional chemical treatments, which rely on brood less periods and are increasingly associated with resistance development, hive contamination, and collateral harm to bees and beneficial microorganisms.

To address these challenges, sustainable, non-chemical alternatives that can be applied year- round are urgently needed. One such strategy is hyperthermia, which exploits the differential heat tolerance between bee pupae's and mites. This method was first explored in the early 1990s by Prof. Engels and his team at the University of Tübingen, who demonstrated that controlled thermal treatment could effectively reduce mite loads without damaging bee brood.

Building on this concept, we developed the Varroa Controller, a device introduced to the market in 2010. Over the past 15 years, thousands of beekeepers worldwide have successfully implemented hyperthermia, confirming its viability across diverse climatic and management conditions. In this paper, we present a systematic approach for integrating hyperthermia into the beekeeping season, tailored to regional brood cycles and environmental factors. A proposed annual treatment plan is outlined, and practical guidance is offered for optimizing effectiveness and minimizing colony stress.

We also summarize beekeepers' experiences collected over more than a decade, demonstrating the method's consistency, safety, and utility as part of integrated pest management (IPM) strategies. Our findings support hyperthermia as a robust, residue-free tool for Varroa control, with the potential to reduce reliance on chemical interventions and enhance colony resilience in the face of evolving environmental pressures.

Hyperthermia against the Varroa mite

15 years successfully using the Varroa Controller



Future-proof without chemicals during the bee year

By: Dr. Wolfgang Wimmer for Apimondia 2025

www.varroa-controller.com



- **01** Hyperthermia with the Varroa Controller works for small and large apiaries.
- **02** Various models currently sold in Europe, Australia/NZ, Canada/US.
- **03** Enables strong hives and higher honey yields.
- **04** Allows an effective treatment at the beginning, during and at the end of the bee year.



**Successfully in the
market since 15
years**

Main principle: Hyperthermia

- A tried-and-tested principle from the 1990s.
- Targeted heating of the **capped bee brood**, where **mites are locked in**.
- Biochemically: heat shock leads to permanent cell damage (Protein denaturation) – killing the mite.

A chemical-free treatment at the start, but also throughout the bee year.

Treating the Varroa mites in the brood?

Yes!...



In Spring

80% of *ready to reproduce* mites are in the capped brood.



In Summer

70% of mites are in the capped brood.

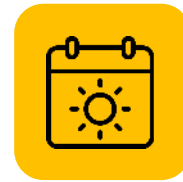


In Autumn

60% of mites are in the capped brood.

Routine: the key to Success

1. Early reduction of the mite population in spring



2. Trapping and removing mites in summer



3. Building up strong hives in autumn



Advantages

- Eliminates 80% of the *ready to reproduce* mites during the Spring treatment.
- Kills the mites in the capped brood.
- Enables long-term management of the bees' health.
- No more colony losses due to the Varroa mite.
- No chemical stress on the bees.
- Works well against mites after re-infestation.
- Optimizes honey yield.

97% treatment efficacy - tested from beekeeping institutes in Belgium and Germany.

Heat treatment in 7 steps



SCAN ME

7 Steps of
treatment
with the
Varroa
Controller

1. Preparing at the apiary
2. Filling water in the VC
3. Starting to heat the VC
4. Placing bee free **capped brood frames** in the VC
5. Applying the sensor
6. Starting the treatment
7. Bringing the brood frames back to the hives.



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In Spring



Preparing at the apiary

Generator in the field.



Varroa Controller

Temperature measurement with precision sensor

Reliable humidification of the bee brood

High-quality treatment chamber made of stainless steel

Fully automatic treatment with status display



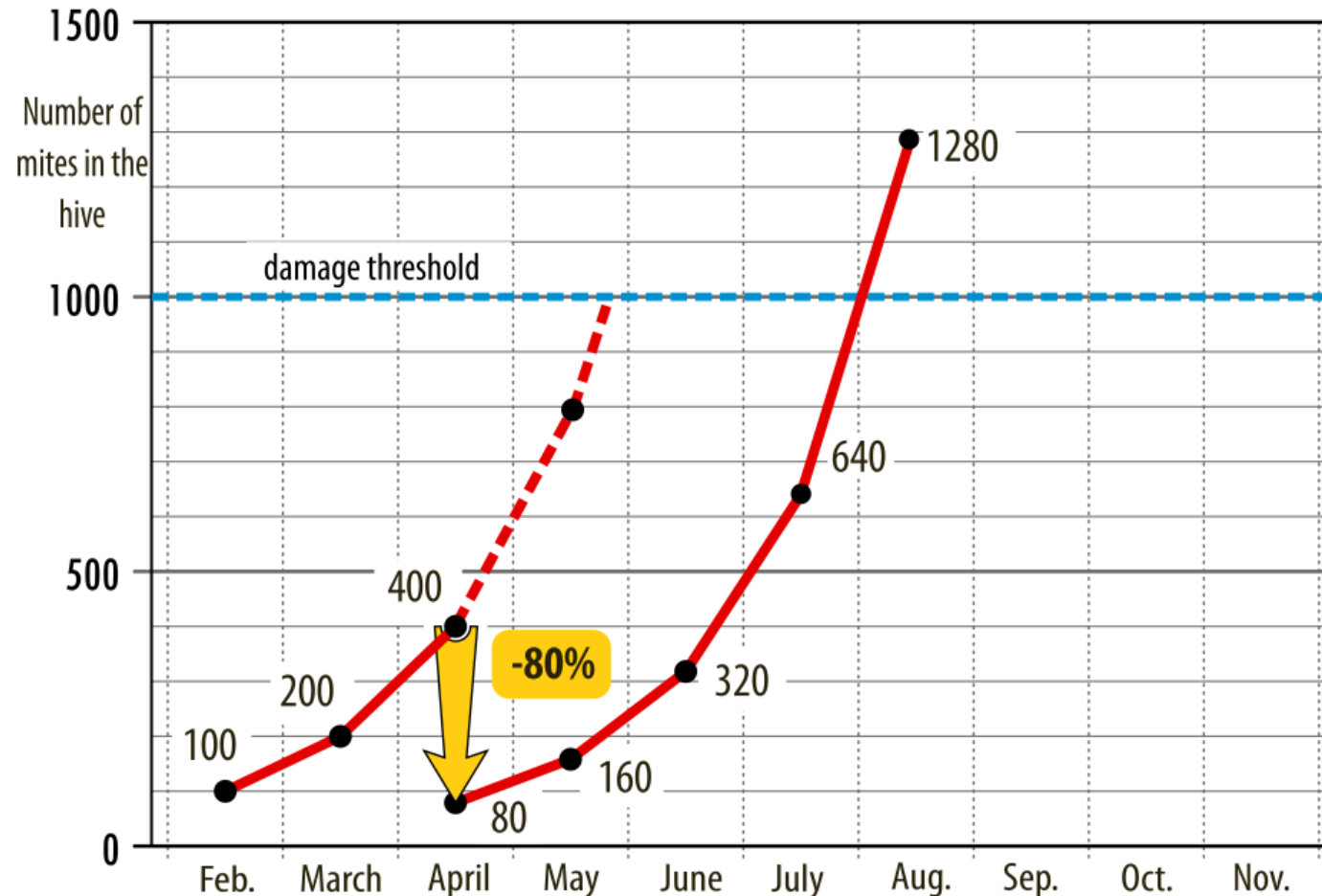
The main elements of the Varroa Controller





In Spring

Eliminate mites and their offspring early!



- 2 to 3 capped brood frames treated with hyperthermia to keep mite level low from the start.
- One untreated mite develops to 32 mites in just 5 months.

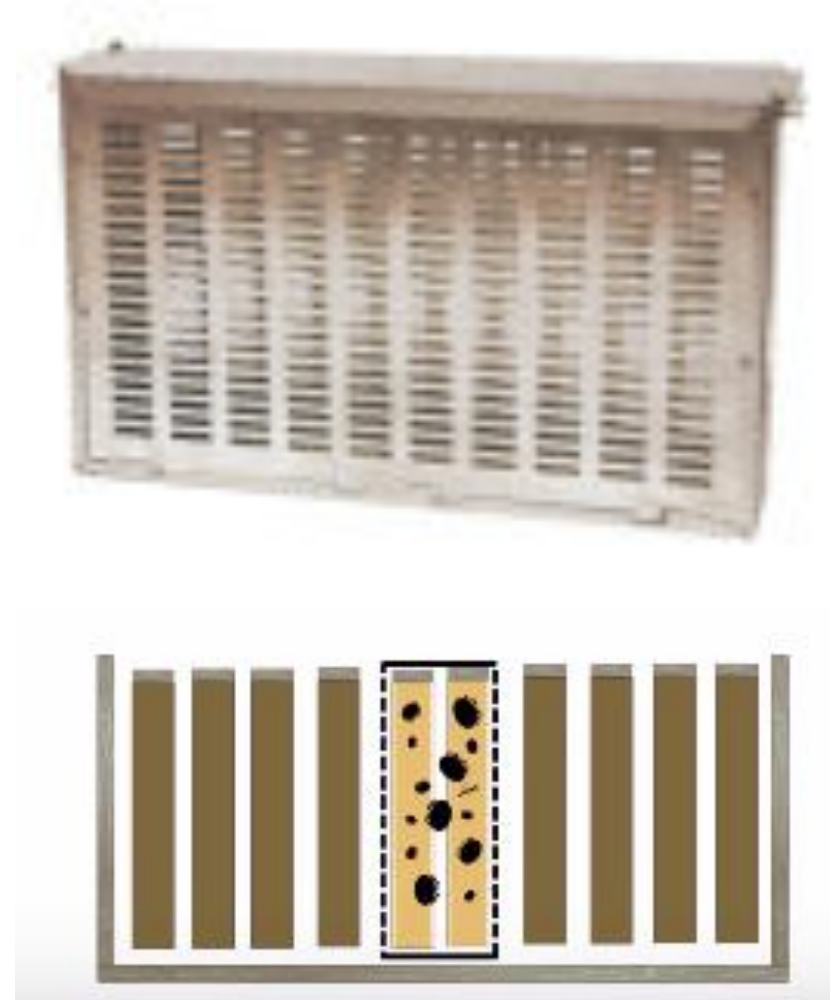


In Summer

Catching and removing mites with the Duplex Framebox.

- Lock the queen bee with 2 frames in the **Duplex Framebox**.
- Exchange the brood frames after 12 days – Heat treat these frames.
- On day 24 all the mites are in the only 2 brood frames left– Heat treat these frames.
- Use the treated frames to build nucleus.
- Release the queen again.

Duplex Framebox



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In Summer



Finding the queen

Placing the Duplex
Frame Box in the hive



Two capped brood
frames after 12 (and 24
days) to heat treat.



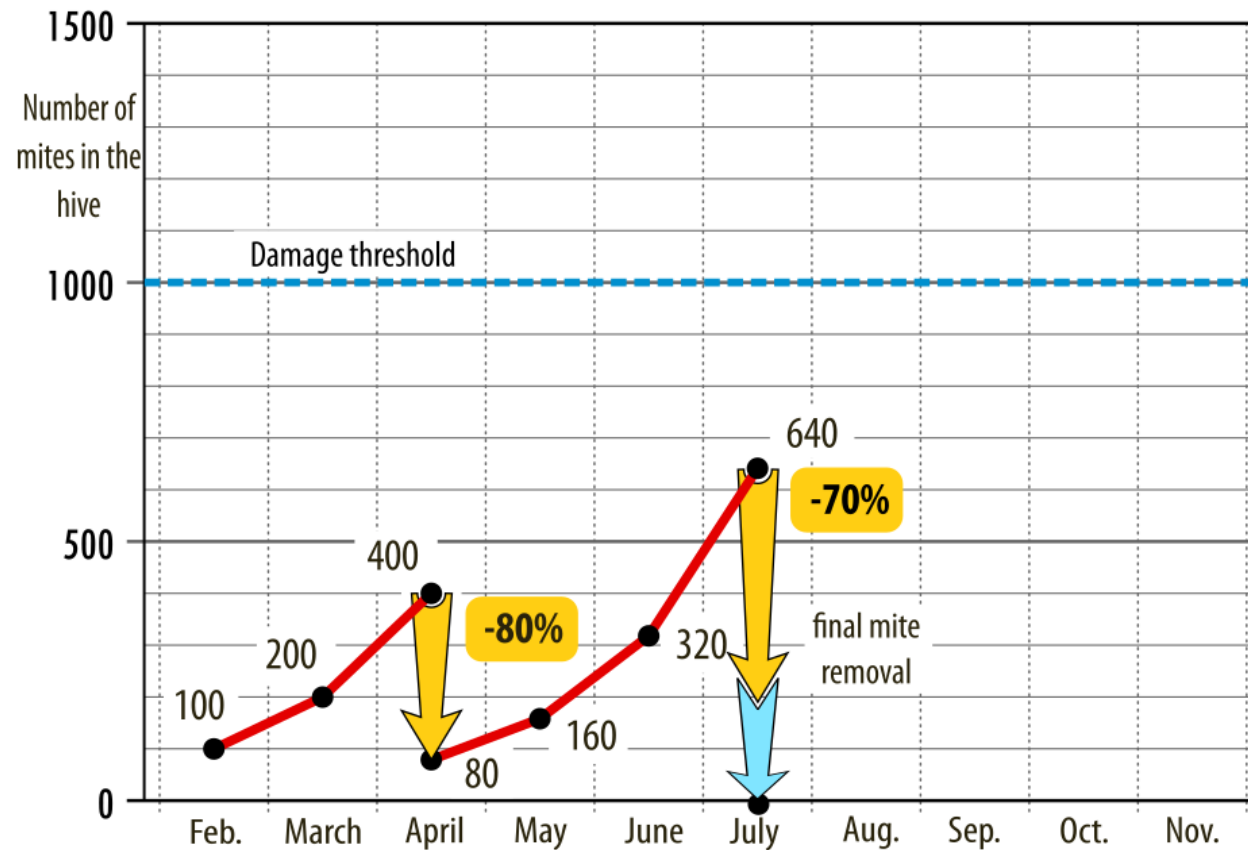
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In Summer

**Get mite-free colonies,
build nucleus and harvest
20% more honey!**

- No mite pressure in the summer months
- Making new colonies with the treated frames
- Take advantage of a late nectar flow – your bees are safe.



Repeating the treatment with 2-3 capped brood frames per hive - as in Spring treatment.



In Autumn



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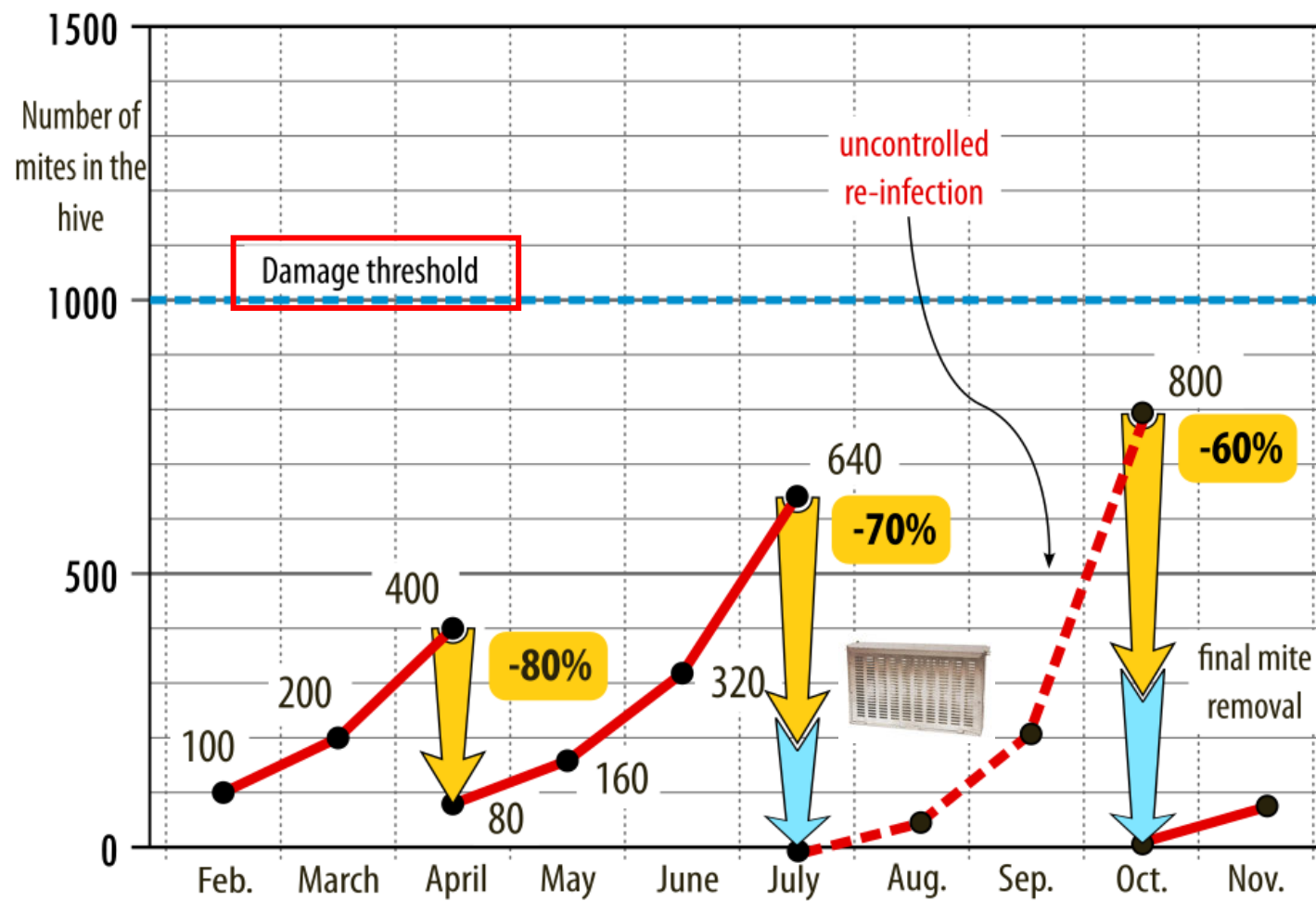




Autumn

Get the colonies fit for Winter and stay below the damage threshold at all times!

- Respond to any un-controller re-infection and prepare timely for the Winter.
- Final heat treatment between end of September and mid-October, incl. residual mite treatment.



The 3 models of the Varroa Controller

VC XLarge

Fits 20 large or 40 narrow frames

VC Standard

Fits 20 normal frames

VC Light

Fits 10 large or 20 narrow frames



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Handbook of heat treatment against the Varroa



3rd edition with new experience reports from commercial beekeeping, apitherapy, Demeter beekeeping and more!

Prologue Prof. Dr. Wolf Engels

With testimonials of beekeepers using hyperthermia and the Duplex-Framebox:

Kurt and Renate Tratsch, Jürgen Schmiedgen,
Olga Cadosch, Thomas Klepp,
Helena Proková, Günter Friedmann.

Illustrations: Michael Preisel



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Interested? more about heat treatment and user testimonials in my Handbook



Download the
Handbook for free!

www.varroa-controller.com
goes Apimondia 2025!



Visit us at booth B114

Any questions?

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