



**INTRODUCTION:** Varroa destructor is now present in most UK honey bee colonies. While approved chemical treatments are often necessary, many beekeepers also use non-chemical (biotechnical) methods to help reduce mite levels, slow resistance, and support long-term colony health.

This guide explains the main non-chemical approaches used in the UK, what they aim to achieve, and their limitations. These methods are usually most effective when used as part of an Integrated Pest Management (IPM) strategy alongside regular monitoring.

Important: Non-chemical methods rarely eliminate varroa on their own. Monitoring remains essential, and approved treatments may still be required.

## WHAT “NON-CHEMICAL” VARROA CONTROL MEANS

Non-chemical control methods:

- Do **not** involve veterinary medicines
- Aim to **reduce mite reproduction or spread**
- Often work by exploiting the **varroa life cycle**
- Help reduce reliance on repeated use of the same treatment type

They are sometimes called **biotechnical methods** and are widely recognised in UK beekeeping education.

## COMMON NON-CHEMICAL VARROA CONTROL METHODS (UK)

### Overview Table

Method	What it targets	When it's typically used	Key limitation
<b>Drone brood removal</b>	Reproduction in drone cells	Spring / early summer	Labour-intensive
<b>Brood break strategies</b>	Mites in capped brood	Swarm season / requeening	Requires planning
<b>Shook swarm</b>	Mites in brood	Spring / early summer	Disruptive
<b>Comb renewal</b>	Long-term disease pressure	Ongoing	Slow impact
<b>Open mesh floor</b>	Natural mite drop	Year-round	Limited effect alone
<b>Sugar dusting</b>	Phoretic mites	Any time	Evidence mixed
<b>Stock selection</b>	Colony hygiene traits	Long-term	Gradual benefit

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## DRONE BROOD REMOVAL (DRONE BROOD TRAPPING)

Varroa mites prefer **drone brood** because drones take longer to develop, giving mites more time to reproduce under the Capping.

Some beekeepers encourage drone brood on a designated frame and remove it before emergence. This physically removes mites from the colony.

### Why it helps

- Targets mite reproduction
- No chemicals or residues
- Useful during spring build-up

### Limitations

- Only removes a proportion of mites
- Requires regular inspections
- Not a stand-alone solution

## BROOD BREAK STRATEGIES

Varroa reproduce inside sealed brood. Temporarily interrupting brood rearing reduces the number of protected mites.

Examples include:

- Natural brood breaks after swarming
- Planned splits
- Temporary queen caging (used by experienced beekeepers)

### Why it helps

- Exposes more mites on adult bees
- Can improve effectiveness of follow-up treatments

### Limitations

- Requires good timing
- Not suitable for all colonies or seasons

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## SHOOK SWARM METHODS

A shook swarm involves moving adult bees onto fresh foundation, leaving brood (and many mites) behind.

### Why it helps

- Resets comb
- Reduces brood-associated mites
- Useful in disease control contexts

### Limitations

- Highly disruptive
- Requires strong colonies and good conditions
- Not routine management for beginners

## COMB RENEWAL

Old comb can harbour disease spores, residues, and pests.

Regular replacement of old brood comb:

- Improves overall hive hygiene
- Supports healthier brood rearing
- Helps colonies cope better with stressors like varroa

### Best practice

- Gradual replacement over several seasons
- Integrated into routine hive management

## OPEN MESH FLOOR AND MONITORING BOARDS

Open mesh floors allow some mites to fall out of the hive naturally and support monitoring.

### Important note

- They are primarily a **monitoring aid**
- Alone, they do not control varroa at damaging levels

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## SUGAR DUSTING (ICING SUGAR)

Dusting adult bees with icing sugar aims to encourage grooming and dislodge mites.

### Current understanding

- May dislodge some phoretic mites
- Scientific evidence for long-term control is mixed
- Should never replace proper monitoring or treatments

## SELECTING AND BREEDING FROM BETTER COLONIES

Some colonies show better:

- Hygienic behaviour
- Grooming behaviour
- Ability to cope with mite pressure

Over time, selecting queens from such colonies may improve resilience.

**This is a long-term strategy**, not a short-term fix.

## WHAT NON-CHEMICAL METHODS CAN AND CAN'T DO

### They CAN:

- Reduce mite reproduction
- Support chemical treatments
- Slow resistance development
- Improve overall colony management

### They CANNOT:

- Eliminate varroa permanently
- Replace monitoring
- Guarantee colony survival on their own

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## BEST PRACTICE SUMMARY

- Monitor regularly
- Understand the varroa life cycle
- Combine methods sensibly
- Keep records of what works
- Review outcomes year-to-year

## OFFICIAL GUIDANCE AND FURTHER READING

### Official Guidance and Further Reading

- National Bee Unit / BeeBase - <https://www.nationalbeeunit.com>
- British Beekeepers Association - <https://www.bbka.org.uk>
- BeezKnees – Varroa Management - <https://beezknees.co.uk/varroa-management>

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