OP-173 [Bee Health]
B-THENET: Advancing Sustainable Beekeeping through Knowledge Exchange and BestPractices

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"B-THENET" (Best practices and innovations for a sustainable beekeeping) is a four-year project funded by Horizon EU, aimed at modernizing the beekeeping sector by sharing practical knowledge and fostering the exchange of best practices. The project's objectives include establishing a multi-actor network connecting beekeepers, researchers, advisors, and other actors in the apiculture sector; collecting, categorizing, and selecting best practices and new research findings using a bottom-up approach; and creating digital platforms for discussing, developing, and storing best practices. The "Exchange Platform" (https://www.bthenet.eu/platform/) is where best practices are developed, while the "Repository Platform" (https://www.bthenet.eu/repository-platform/) stores completed co-created practices.

The B-THENET consortium consists of 18 partners from 15 EU countries, including research institutions, universities, national and international beekeeping associations, and communication agencies. This diverse consortium works to uncover and share knowledge, ensuring it successfully reaches end users. Researchers collaborate with beekeeping associations to bridge the gap between science and practice. Scientists, beekeepers, and advisors collectively prioritize and develop beekeeping practices and innovations at the EU level. Beekeepers and advisors contribute their practical expertise, while researchers guide the development of sustainable practices and assess their value. Social science centres and communication agencies ensure that practices are presented in a way that maximizes knowledge uptake. Thirteen National B-THENET Centres in partner countries facilitate knowledge exchange through targeted training and events, while three International B-THENET Centres support training at the international level—one for beekeepers, one for advisors, and one for all other stakeholders of the apiculture sector.

After three years, B-THENET has successfully collected, developed, and disseminated 75 best beekeeping practices across various themes, including varroosis, American foulbrood, European foulbrood, apiary and colony management, bee feeding and watering, and record keeping. In the project's final year, additional practices on routine preventive hygiene, nosemosis, small hive beetle, and invasive vespid management will be developed. These practices are available on the B-THENET repository platform in 12 languages: Croatian, Danish, Flemish, German, Greek, Hungarian, Italian, Polish, Slovak, Slovenian, Spanish, and Swedish. They will also be compiled into two comprehensive manuals, one for beekeepers, available in all 12 languages, and another for advisors, published in English. Digital resources for beekeepers include two booklets on proper hive management, 20 infographics, and two factsheets outlining the project methodology. The National and International B-THENET Centres organized 147 training sessions, reaching 5,805 beekeepers, and promoted B-THENET through 171 dissemination events at both the national and international levels. Future prospects include expanding best practice development to more countries and featuring them on the platforms, enabling a broader community of beekeepers and advisors to benefit from B-THENET's results.

SYMPOSIUM / EU Projects
Hall A1 – 24 September 2025
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"B-THENET: Advancing Sustainable Beekeeping through Knowledge Exchange and Best Practices"

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Introducing B-THENET

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B-THENET Thematic Network

- **B-THENET** is **the first Thematic Network** (four-year long) in Europe funded by Horizon EU Activities, that **focuses on Best Beekeeping Practices and Innovations**. It started on 1st Sept. 2022 and will end 31st Aug. 2026

- B-THENET (https://www.bthenet.eu/) aims to **gather knowledge on Best Beekeeping Practices and make them available in a Repository Platform.**

HORIZON EUROPE

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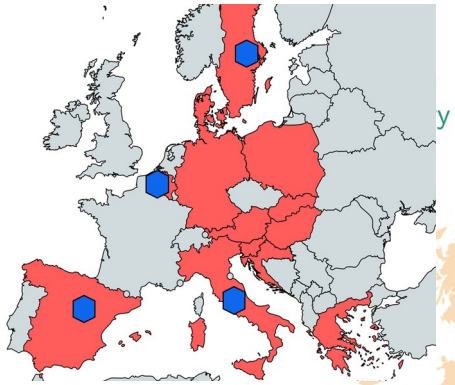
B-THENET Consortium

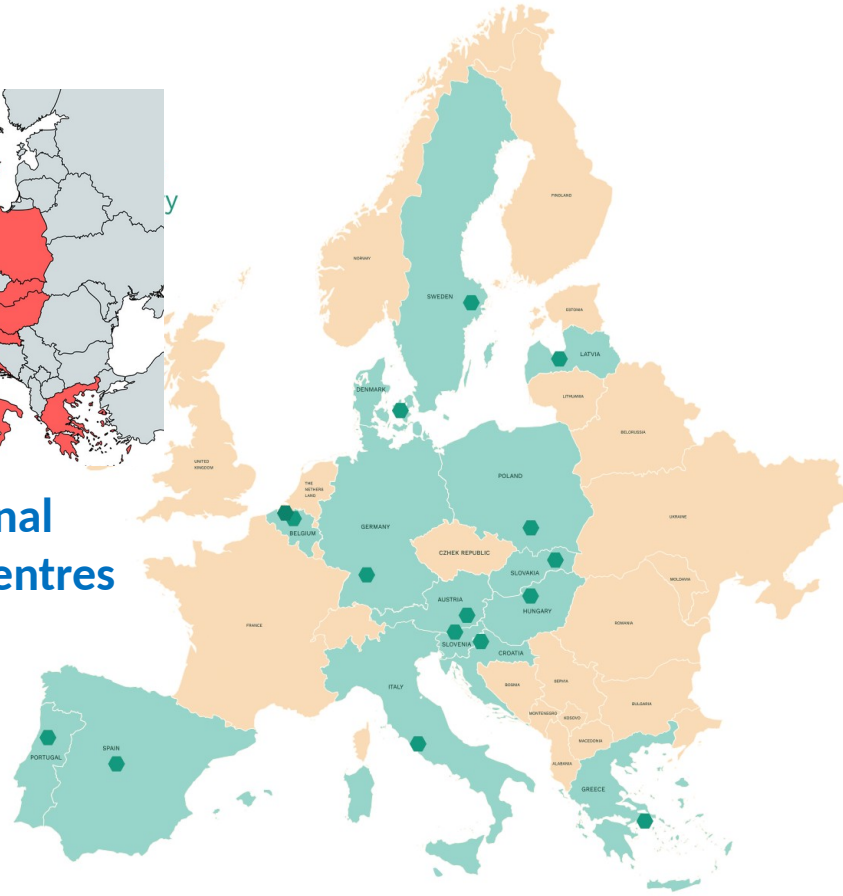
The B-THENET is based on a **multi-actor approach** encompassing beekeepers, advisors, researchers, policymakers, industry, consumers, and all stakeholders of the beekeeping sector.

18 Project Partners + 24 Collaborating Partners

- **Research organizations**
- **Universities**
- **International and national beekeepers' associations**
- **Centers for advisors training**
- **Centers for social sciences and humanities**
- **Agencies for communication and dissemination**



3 International B-THENET Centres



13 National B-THENET Centres

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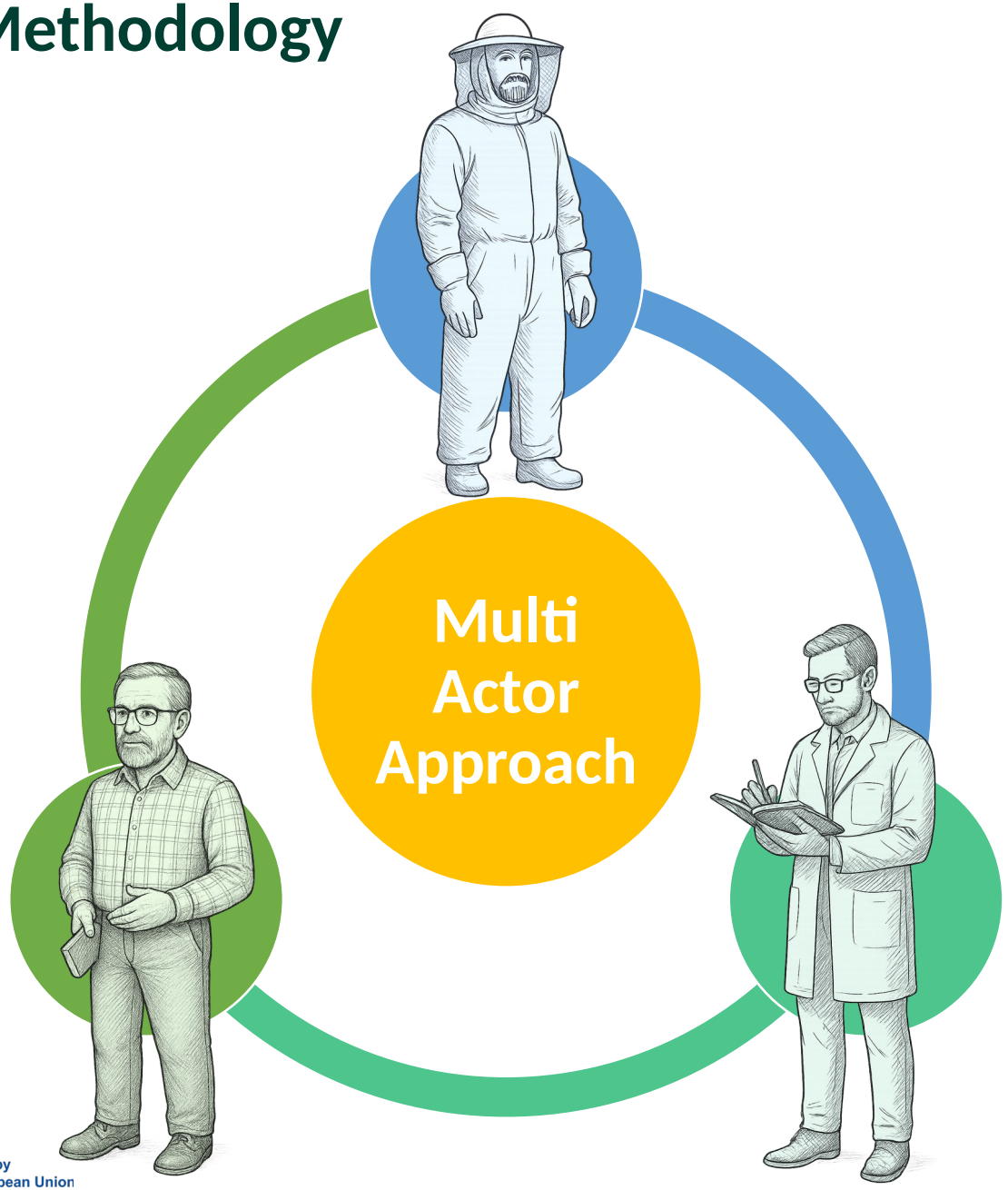
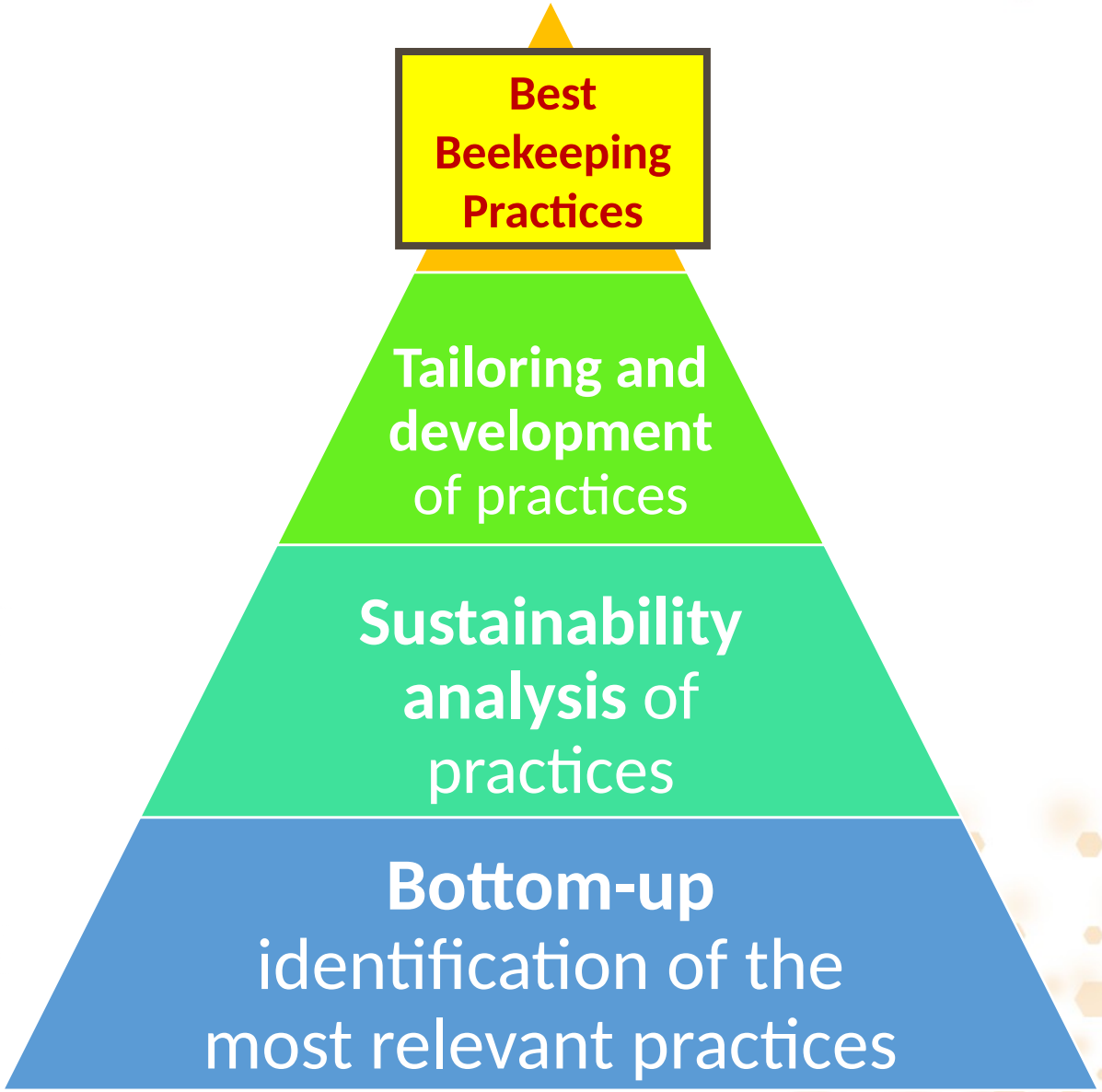
Methodology





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Bottom-up Survey

- Round 1 | Apiary set-up and management/maintenance (GBP), Varroois (BMB)
- Round 2 | Colony set-up and management/maintenance (GBP), American foulbrood (BMB)
- Round 3 | Record-keeping, Bee feeding and watering (GBP), European foulbrood (BMB)
- Round 4 | Routine (preventive) hygiene practice (GBP), Nosemosis + Small Hive Beetle + *Vespa velutina* (BMB), Miscellaneous

EU survey

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The concept of «Best Beekeeping Practices»

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What are Best Beekeeping Practices?

Practices adapted to a specific **geographical context** (e.g., different climatic and environmental conditions) and a specific **beekeeping context** (e.g., different bee genetics, beekeeping equipment, and diseases), and therefore representing the **state of the art of beekeeping for a given area.**

In B-THENET, 13 different countries develop best beekeeping practices adapted to their local context

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Differences between EU contries: examples

	Slovenia	Italy	Sweden	Spain
Climatic conditions/ equipments				
Bee genetics	*Apis m. carnica*	*Apis m. ligustica*	*Apis m. mellifera*	*Apis m. iberiensis*
Bee diseases and predators				

How can BBPs support beekeepers to contrast hive colony mortality?

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Why are Best Beekeeping Practices relevant to Honey Bee Health?

Challenge

MAIN STRESSORS leading to colony mortality

- Varroa infestation
- Pesticides
- Management
- Climate change

Knowledge and Practice

Best Practices for:

- Varroa management
- Identify a proper area to locate the apiary to avoid exposure to pollutants (e.g. pesticides, heavy metals, etc)
- Bee feeding/watering

Damage control/Prevention

Application of best practices over time:

- Levels of varroa infestation kept under control
- Relocation of apiaries placed in polluted areas
- Adequate nutrition throughout the seasons

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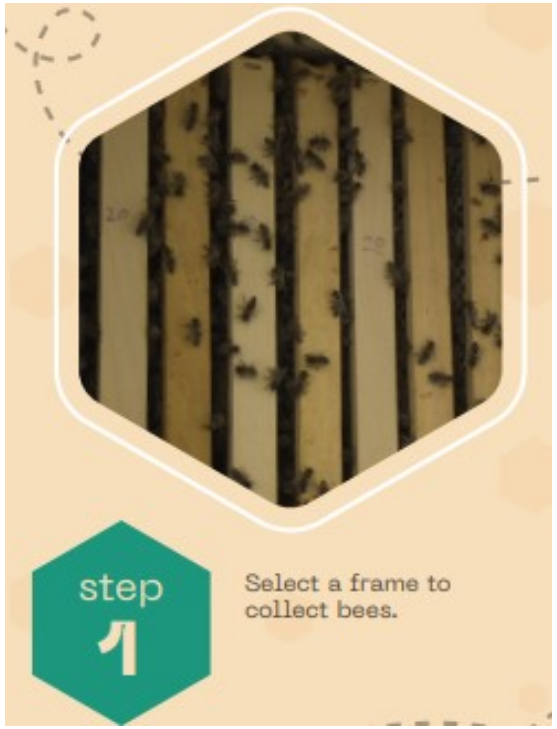
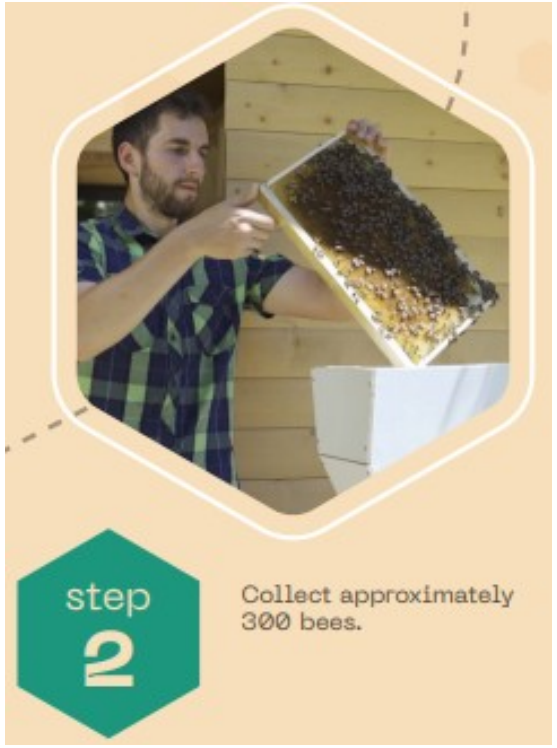
Examples: Best practices to monitor varroa infestation

1. Sugar shake technique





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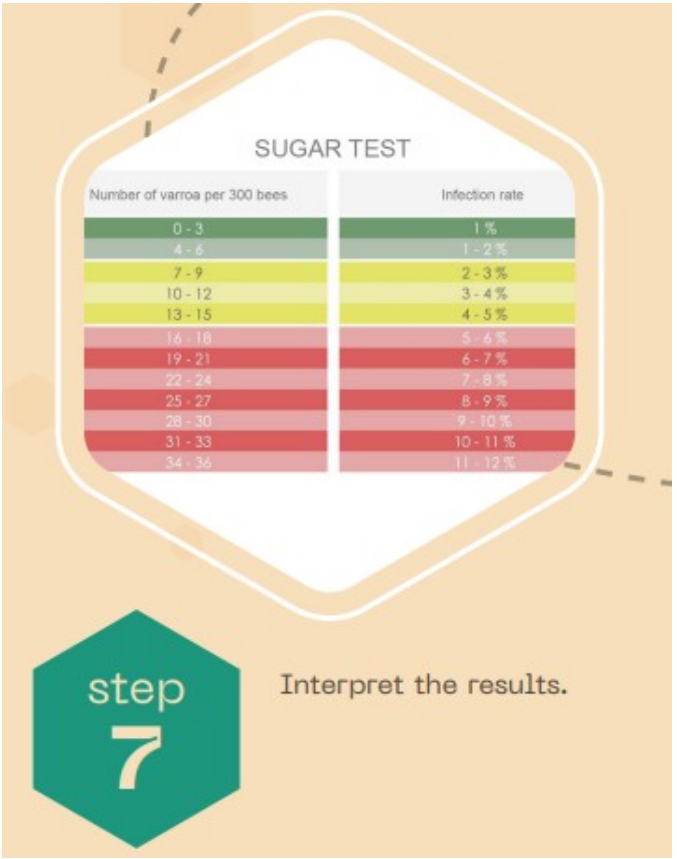
… Sugar shaking technique



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2. Alcohol washing technique

step 1

Take a bee sample of approximately 75 ml using a 100 ml jar. There are various methods to do this, but we prefer to scrape the bees into the jar. Be careful not to include the queen in the sample.

step 2

Take a bee sample of approximately 75 ml. We prefer to shake the bees into a bowl and use a 100 ml jar. Be careful not to include the queen in the sample.

step 3

There are many washing devices available on the market. It is important to have a chamber where you can wash the bees with alcohol and a sieve to separate the mites from the bees.

step 4

Pour alcohol up to the fill line, add the bees, close the lid, and ensure all bees are covered with alcohol.

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… alcohol washing technique

step 5

Make circular movements with your wrist for 20 seconds. Then, let the container rest for 30 seconds to allow the mites to settle.

step 6

Lift the jar to a comfortable position and count the number of mites in the outer container.

$$\frac{\text{Mites}}{\text{No of bees}} \times 100$$

$$\frac{18}{38{,}65\text{gx}8=309} \times 100$$

= 6 mites/100 bees

step 7

Calculate the number of mites per 100 bees. Determine the threshold for your local area and decide if your colonies need treatment.

step 8

And yes, be careful not to wash the queen!

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Example: Varroa treatment

Oxalic acid

step 1

Treatment is most effective when there is no brood. In Northern Europe, this typically occurs from November to December or during artificially created broodless periods.
Use a syringe to trickle the treatment evenly on the bees in the bee space, following local recommendations. The handling time should be less than 30 seconds.

step 2

Prepare the oxalic acid solution according to the instructions for your preferred product. Here, we demonstrate how to produce the base solution using oxalic acid dihydrate. You will need 75 grams of oxalic acid, 1 kg of sugar, and 1 litre of clean water. Mix carefully.

step 3

For later use, store the solution in a safe, cool, and dark place, and clearly label it as OXALIC ACID.

step 4

Open the bee colony in a situation where there is no or as little brood in the colony as possible. Good to do, if the bees are in a cluster and it is cold. Do not worry – you open for short time. For Northern Europe this is from November to December. Now, trickle the solution into each space occupied by bees. Practice before with water in a sink. Distribute evenly. Handling time less than 30 sec.

step 5

Use an insert under your colony to measure natural mite fall. Check the efficacy after about 7 days.

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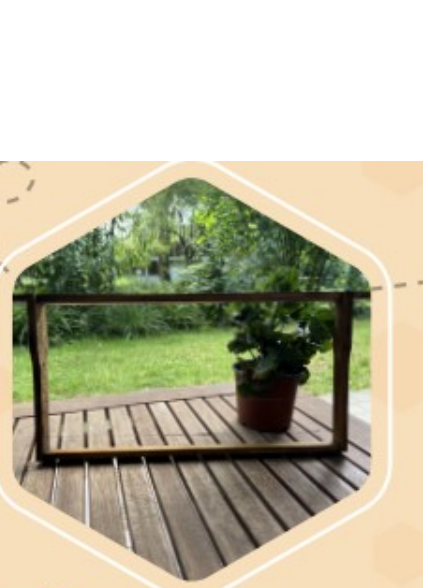
Maximise the effect of treatments adopting IPM (biotechniques)

e.g. 1. Drone brood removal



step 1

Use an empty frame.

step 2

Mark each frame on the top bar, so it can be recognized quickly. Hang the empty frame in the broodnest of the colony.

step 3

Wait for the bees to draw out and cap the drone comb. This usually occurs within 2 to 3 weeks.

step 4

Remove the frame. Ideally about 80% of the comb is capped. If done on a 3-week rhythm, no drones and mites can emerge, as drones take 24 days for development.

step 5

The drone comb is now either frozen or directly melted down. This kills the varroa mites. As mites preferentially enter drone brood, this technique can minimize the mite population.

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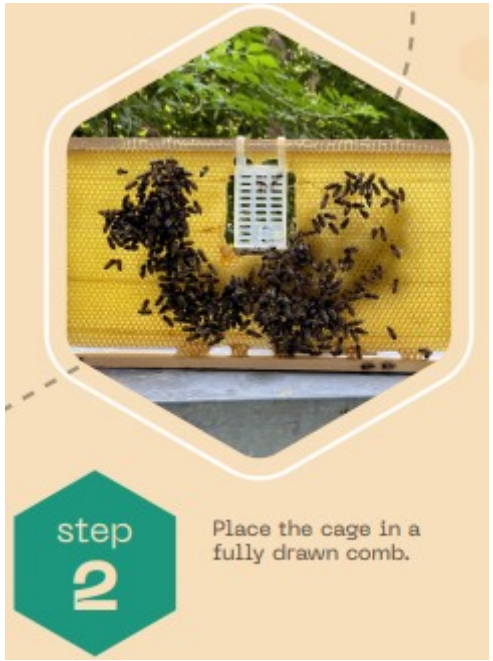
Maximise the effect of varroa treatment adopting IPM (e.g. biotechniques)

e.g. 2. Queen Caging



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… Queen Caging

step 5

Wear protective equipment for the treatment. Use an FFP2 mask, gloves, and a bucket with water for hand washing.

step 6

Prepare a registered oxalic acid-based product according to the specific usage recommendations. Some products may require dilution as part of the preparation process.

step 7

Apply the prepared product to the bee colonies as instructed for that product. Most products are administered via spraying or dribbling; ensure the recommended doses are strictly followed.

step 8

Check for fallen mites on the bottom board for the next 7 days.

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Useful B-THENET resources for beekeepers

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B-THENET Repository Platform

1. Register

2. Find and download the files of interest

Go to the Repository Platform

https://www.bthenet.eu/

Access the Repository platform

https://www.bthenet.eu/repository-platform/

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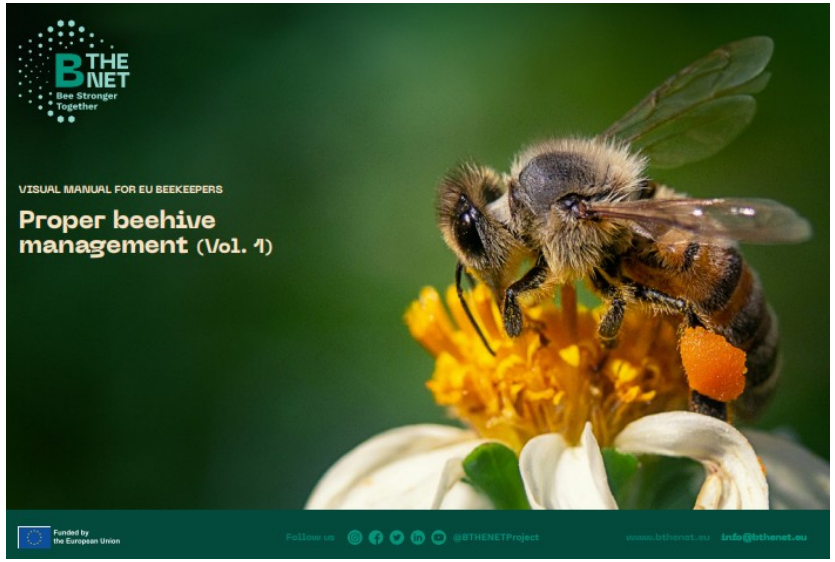
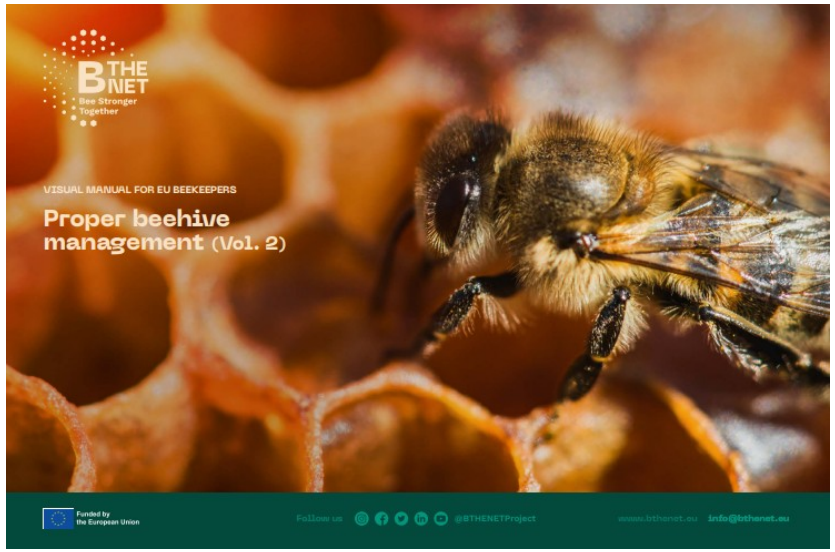
Resources to download: Booklet on Proper beehive management (in EN)





1 for each of the 4 years of the project

Digital Booklet # 1:

Download:

https://www.bthenet.eu/wp-content/uploads/2023/06/2023_B-THENET_Digital_Booklet.pdf

Digital Booklet # 2:

Download:

https://www.bthenet.eu/wp-content/uploads/2024/05/B-THENET_Digital_Booklet-2.pdf

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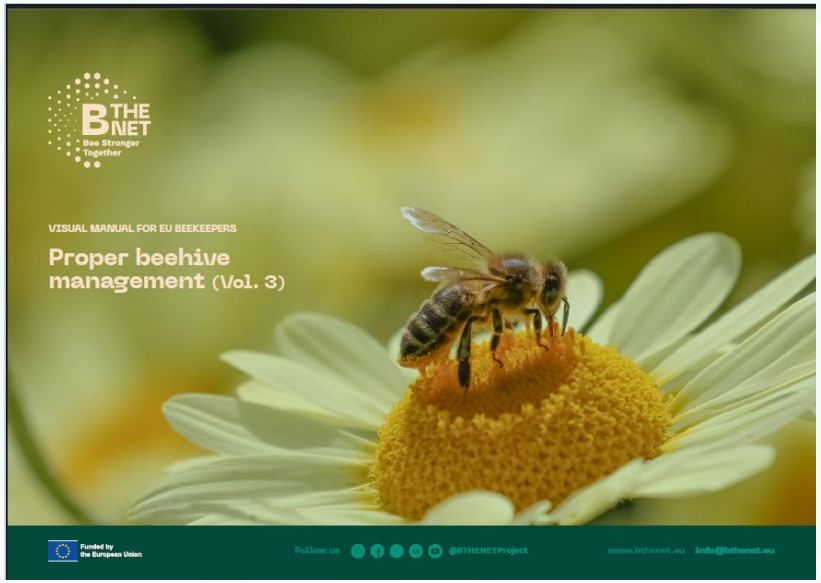
Resources to download: Booklet on Proper beehive management (in EN)



Digital Booklet # 3 | VISUAL MANUAL FOR EU BEEKEEPERS Proper beehive management (Vol. 3)

Download:

https://www.bthenet.eu/wp-content/uploads/2025/05/B-THENET_Digital_BookletV3.pdf

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Resources to download: Infographics on GBPs (in English)

Good Beekeeping Practices

Find the Right Spot for Your Apiary

- Setting-up apiaries in an area accessible to vehicles
- Avoiding areas exposed to excessive humidity and wind
- Ensuring presence of trees (or other barriers) to create protection against weather stressors
- Maintaining appropriate distance from other apiaries (f or hive production and bee health)
- Having enough space for storage rooms working tools
- Keeping safe distance from houses villages

Setting Up the Apiary

- Seasonally relocating the apiary
- Proper positioning of the hive
- Avoiding obstacles for the bees

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Resources to download: Infographics on BMBs (in English)

Biosecurity Measures

Biotechniques

- Catching mites in brood frames
- Brood Removal
- Queen caging
- Heat treatment

How to Use Organic Anti-Varroa Treatments

- Assessment of varroa infestation level during the beekeeping season – Alcohol wash
- Assessment of varroa infestation level during the beekeeping season – Sugar shaking
- Assessment of varroa infestation level during the beekeeping season

Using Low-Impact Compounds Properly

- Use of oxalic acid – Trickling
- Use of oxalic acid – Sublimation
- Use of formic acid
- Use of thymol

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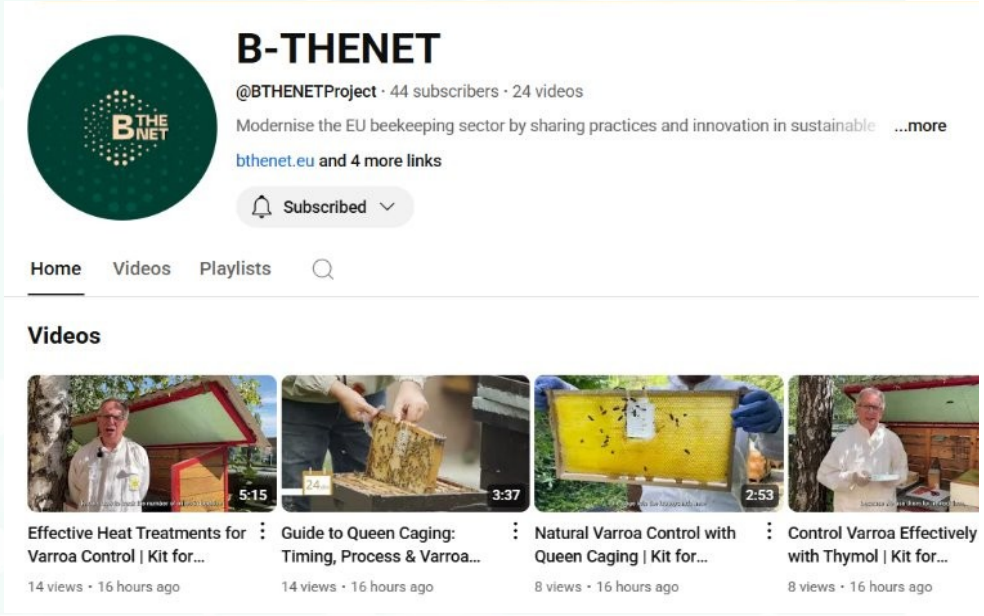
B-THENET kit for beekeepers'| **VIDEO CLIPS**

20 videos are online!

Kit for Beekeepers | Good Beekeeping Practices

Kit for Beekeepers | Biosecurity Measures in Beekeeping

1. Setting-up apiaries in an area accessible to vehicles
2. Avoiding areas where allergenic or toxic plants could be found in a significant quantity
3. Avoiding areas exposed to excessive humidity and wind
4. Having enough space for storage rooms/working tools
5. Keeping safe distance from houses/villages (for human safety)
6. Preventing theft of hives
7. Keeping an appropriate number of hives
8. Seasonally relocating the apiary
9. Proper positioning of the hive
10. Avoiding obstacles for the bees
11. Assessment of varroa infestation level during the beekeeping season| Alcohol wash
12. Assessment of varroa infestation level during the beekeeping season| Sugar shaking
13. Assessment of varroa infestation level during the beekeeping season| Soapy water wash
14. Use of oxalic acid| Trickling
15. Use of Oxalic Acid | Sublimation
16. Use of oxalic acid| Strips
17. Use of formic acid
18. Use of thymol
19. Heat treatments
20. Queen Caging



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Integration of Artificial Intelligence into the Platform

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Integration of Artificial Intelligence into the B-THENET Platform

- **Comprehensive multilingual translation** of platform content, covering 15 European languages to ensure accessibility for a global audience.
- **Keyword search functionality** enabling users to enter specific terms and instantly locate related content across the platform (e.g. best practices).
- **Content extraction and reformulation tool** that allows users to explore specific topics in depth, for example analysing, comparing, and summarising elements such as differences in best practices among EU countries involved in the project.

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Thank you for your kind attention!

Contact us

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Our Consortium

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BeeLife

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