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One language for Bees

How beekeepers around the world are finally starting to speak the same data language — and why it matters for every hive.

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The problem hiding in plain sight

Imagine you are a beekeeper in Spain. Every autumn, you record your colony losses, your Varroa counts, and the honeys you harvested. Your neighbour in Belgium does the same. A beekeeper in Egypt does the same. Scientists across the world do the same. Year after year, mountains of careful observations pile up in notebooks, spreadsheets and farm management apps.

And yet — when a government agency or a research team tries to understand what is really happening to bees across the continent, they find themselves staring at an impossible jigsaw puzzle: thousands of pieces that simply do not fit together. Not because the information is wrong, but because everyone recorded it differently.

"Colony strength" means one thing in a Dutch monitoring scheme and something slightly different in a Romanian one. "Varroa infestation" might be expressed as mites per hundred bees in one dataset and as a percentage in another. The name of a disease may appear in four different forms across four databases. When computers try to analyse these records automatically, they fail — and the insights that could save bees are lost.

This is not a small problem. It affects disease surveillance, the ability to track whether protection policies are working, and even the reliability of honey market statistics. As long as bee data remains fragmented, the beekeeping community speaks with a voice that policymakers and scientists cannot fully hear.



The solution: a shared dictionary for the bee world

The answer, developed over years of voluntary work by members of the Apimondia Working Party on Bee Data Standardisation (WP12) together with the technical teams at Dr. Michael Rubinigg, BeeLife European Beekeeping Coordination and ZIP Solutions, is both simple in concept and remarkable in scale.

Think of it not only as a universal dictionary but as operating instructions that define the terms and describe the functional relationships between them. Every term relevant to bees and beekeeping is given a unique, permanent address on the internet: a kind of postal code for knowledge. "Small hive beetle infestation" has its address. "queenless"

has its address. "Honey bee colony" has its address. The same applies to the relationships between the terms. The term "queenless" is a "quality of" a honey bee colony. The term "Small hive beetle infestation" is a "disposition of" a honey bee colony. When anyone — a beekeeper, a researcher, a government database — attaches that address to their data, every computer system in the world can immediately understand what that piece of information means, to which other pieces of information it is connected, and compare it with data from anywhere else, regardless of the human language used.

This dictionary, called the [Pollinator Ontology \(PolOn\)](#), forms the heart of the EU Pollinator Hub Controlled Vocabulary (EUPH-CV). In plain figures: currently, more than 2,600 defined terms are part of the PolOn, while over 8,000 terms build the EUPH-CV, covering everything from bee anatomy to honey chemistry to veterinary medicines, translated into 88 languages so that a beekeeper in Morocco, Japan or Brazil can contribute data in their own language and have it understood everywhere.

What does "FAIR data" mean?

Scientists and data specialists talk about data being "FAIR" — Findable, Accessible, Interoperable and Reusable. In everyday language: your data should be easy to find, open to anyone who needs it, compatible with data from other sources, and useful for purposes beyond its original use. Most bee data today fails all four tests. The Pollinator Ontology is the tool that allows it to pass them.

A real example: one disease, three names. American foulbrood — the bacterial disease that destroys bee larvae — appears in European databases as "AFB", "American foulbrood", "Faulbrut" and "loque américaine". A computer searching for outbreaks sees four separate things where there is only one. With the Pollinator Ontology, all four labels point to the same shared address, and the computer finds them all.

How it was built: a community effort

This dictionary did not appear overnight. It is the fruit of years of patient, largely unpaid work by beekeepers, scientists, veterinarians, and data specialists from across the world who came together in Apimondia's WP12 (within the Quality and Technology Committee).

Their job was not to answer thousands of questions like: What exactly is a "nucleus colony"? How do we distinguish a "swarm" from a "cast"? What are all the different words beekeepers use for the same thing in English, French, Spanish, Arabic and German? Much of this knowledge existed only in specialist print dictionaries — above all, Eva Crane's legendary Dictionary of Beekeeping Terms series — or in the heads of experienced beekeepers. The WP12 volunteers brought it into the digital world.

The technical platform that made this possible was the EU Pollinator Hub, built by BeeLife and ZIP Solutions with support from the European Food Safety Authority (EFSA) and guidance from the EU Bee Health Partnership. It gave the working party the tools to create, debate, translate and publish each concept through a guided online system — accessible to experts with no technical background. Any registered user can propose a new term or suggest a translation. The most experienced members review and approve. Everything is versioned, cited and permanently archived, free for anyone to use.

Ready to use — and open to all

The [Pollinator Ontology is live](#). It is freely available to anyone — no subscription, no fee, no registration needed to consult it. You can browse every concept, read its definition and see its translation in your language. Researchers and database managers can link their own systems to it, making their data automatically comparable to that of others who have done the same.



For individual beekeepers, the most immediate benefit comes through the EU Pollinator Hub itself: a platform where you can deposit data on your colonies, your harvests, your observations — and know that your records will be preserved in a format that scientists and policymakers can actually use, now and in the future. Your knowledge, captured once, works forever.

The vocabulary is hosted at:

- EU Pollinator Hub — explore the vocabulary, deposit data, contribute translations:
- <https://pollinatorhub.eu>
- The complete dictionary, downloadable and permanently archived:
- <https://app.pollinatorhub.eu/vocabulary>
- Permanent repository of the pollinator ontology - <https://gitlab.com/bee-life/controlled-vocabulary>
- A scientific publication that explains how it was constructed and it works: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0353382&utm_id=plos111&utm_source=internal&utm_medium=email&utm_campaign=author

The work continues. New terms are added as science advances. More languages are translated. The Apimondia WP12 and BeeLife will continue to steward the vocabulary in the years ahead, with the goal of making it the global standard for anyone who cares about bees — from the backyard beekeeper recording their first harvest to the international agency tracking pollinator decline across continents.

Bees have always crossed borders. Now, at last, the data about them can too.