

# La santé des abeilles

Apport de la recherche  
en évaluation  
des risques

9 décembre 2019

CONFERENCE INTERNATIONALE  
ANSES-EFSA

Espace du Centenaire  
Maison de la RATP,  
189, rue de Bercy - 75012 Paris



# EU Bee Partnership



# CONTEXTE



- Decline in biodiversity throughout Europe
- Beekeepers and their associations require information to present their concerns to authorities, influence decision-making, and seek for references on their practices and production
- EU institutions (e.g. EFSA) require bee data for their activities
- Launch of the **EU Bee Platform in 2017:**
  - Terms of Reference:  
<https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/sp.efsa.2018.EN-1423>
  - Objective: improve data collection, management, sharing and communications to achieve a holistic approach to the assessment of bee health in Europe and beyond

# SOURCES OF BEE-RELATED DATA

- EU projects: datasets from PoshBee, Insignia, B-Good, STEP + national projects + COLOSS + Epilobee
- Smart bee hives - sensors
- Beekeeping management apps/monitoring initiatives
- Biodiversity of bees and breeding
- DARs, and RARs
- Weather, Soil occupation, etc.
- Market data for bee products



# EU Bee Partnership

During the first 12 months, the EUBP focus on data standardisation, collection, processing and communication, using a '**Proof of Concept**' (**PoC**) approach

2 PoCs on the way:

**BeeXML** - standardisation of bee data

**The Bee Hub** - data collection, management, sharing and communication

## Funding:

Short-term: support the proposed 'proof of concept' on data sharing through in-kind contribution by stakeholders

Long-term: to allow the EU Bee Partnership to sustainably address data sharing for the benefit of bee health

# BIG DATA

- Big data enables better more robust analytics
  - Quality, Quantity and Relevance all matter when it comes to data
  - Breadth and Consistency also matter
- What matters most is the **free exchange of data**, the ability to put relevant anonymized data together, and merge it with secondary data (weather, crop outcomes, etc) for deep analysis
- Can also allow for better reporting for policy makers and governmental decision making

# BEEXML

## The Promise of Standardized Data

Proof of Concept (PoC) for a standardisation of bee  
data



# BEEXML

Apimondia Working Group #15 (AWG15)

Standardization of data on bees and beekeeping

Robert Brodshneider, Ph.D

Joseph Cazier, Ph.D (Presenting) and his team

Walter Haefeker

Peter Neumann, Ph.D

Marten Schoonman

Noa Simon Delso, Ph.D DVM

James T. Wilkes, Ph.D

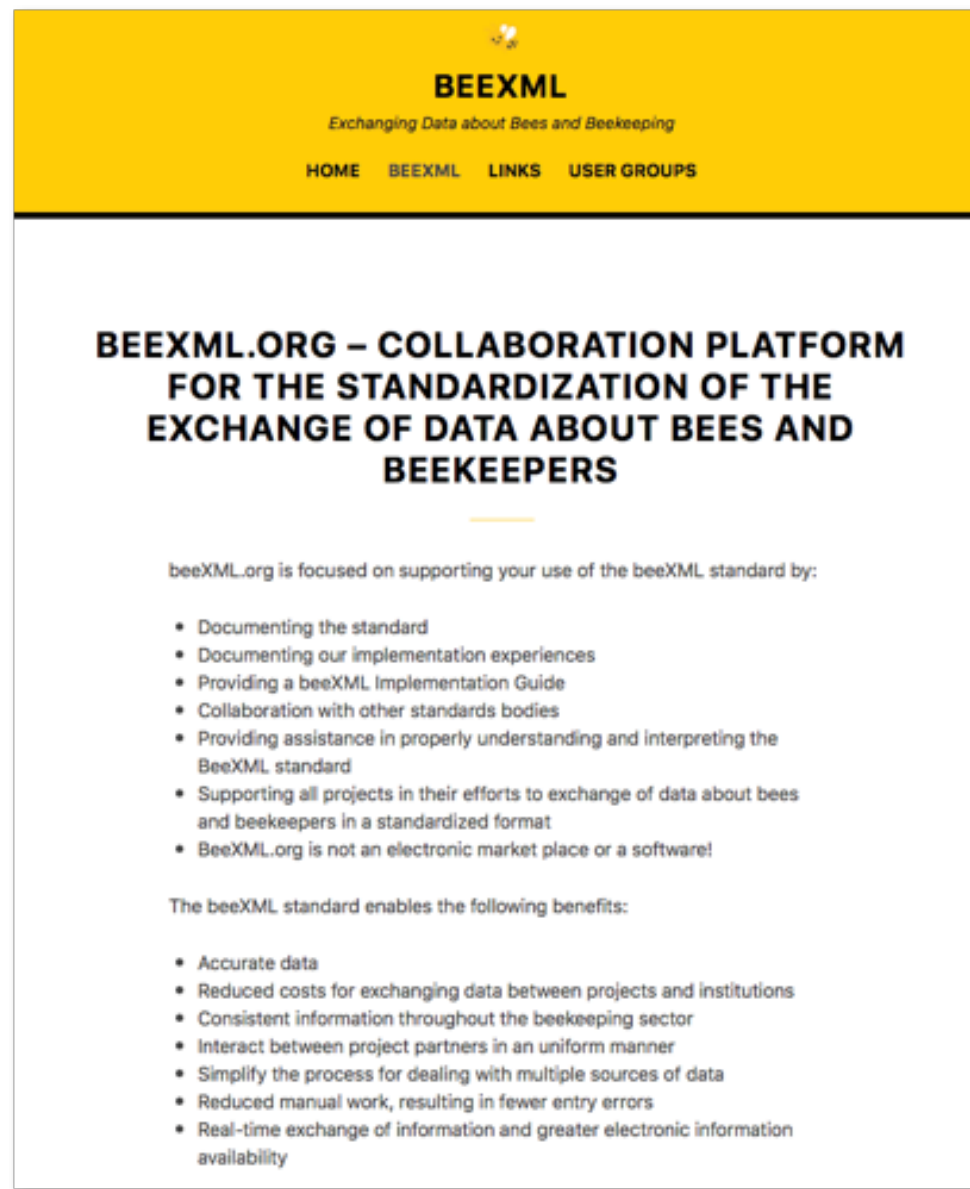
Pim Van Gennip





# BEEXML

- To promote standardized ways for exchange of data in all systems tracking bees and beekeepers.
- Make all systems open source to allow community to understand and get comfortable with what is being processed.



The screenshot shows the BEEXML website homepage. At the top, there is a yellow header with the BEEXML logo and the tagline "Exchanging Data about Bees and Beekeeping". Below the header, there are navigation links for HOME, BEEXML, LINKS, and USER GROUPS. The main content area features a large heading: "BEEXML.ORG – COLLABORATION PLATFORM FOR THE STANDARDIZATION OF THE EXCHANGE OF DATA ABOUT BEES AND BEEKEEPERS". Below this heading, there is a paragraph stating that beeXML.org is focused on supporting the use of the beeXML standard. This is followed by a bulleted list of services provided, such as documenting the standard, providing implementation guides, and supporting projects. Another section titled "The beeXML standard enables the following benefits:" lists advantages like accurate data, reduced costs, and real-time information exchange.

**BEEXML**  
Exchanging Data about Bees and Beekeeping

HOME BEEXML LINKS USER GROUPS

**BEEXML.ORG – COLLABORATION PLATFORM FOR THE STANDARDIZATION OF THE EXCHANGE OF DATA ABOUT BEES AND BEEKEEPERS**

beeXML.org is focused on supporting your use of the beeXML standard by:

- Documenting the standard
- Documenting our implementation experiences
- Providing a beeXML Implementation Guide
- Collaboration with other standards bodies
- Providing assistance in properly understanding and interpreting the BeeXML standard
- Supporting all projects in their efforts to exchange of data about bees and beekeepers in a standardized format
- BeeXML.org is not an electronic market place or a software!

The beeXML standard enables the following benefits:

- Accurate data
- Reduced costs for exchanging data between projects and institutions
- Consistent information throughout the beekeeping sector
- Interact between project partners in an uniform manner
- Simplify the process for dealing with multiple sources of data
- Reduced manual work, resulting in fewer entry errors
- Real-time exchange of information and greater electronic information availability

# Bee Culture

The Magazine of American Beekeeping



BEEKEEPING LIFE SCIENCE RESOURCES OPINIONS CATCH THE BUZZ



## DATA SHARING RISKS AND REWARDS

By: Joseph Cazier, Walter Haefeker, Edgar Hassler For Hobbyist Beekeepers. Introduction In our September Bee Culture article, "BeeXML Part I: The Power of Big Data and Analytics," we discussed how...

[READ MORE](#)



## BXML PART 2 ACHIEVING THE GOAL OF STANDARDIZED DATA

By Joseph Cazier, Walter Haefeker & Edgar Hassler I n Search Of The Genius Hive Last month, in the October issue of Bee Culture, our article "BeeXML Part I -...

[READ MORE](#)



## BXML PART 1 THE POWER OF BIG DATA & ANALYTICS

By Joseph Cazier & Walter Haefeker Enough Data To Build A True Genius Hive. Introduction In previous articles in this series, such as "Peering Into the Future: The Path to...

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CONFERENCE INTERNATIONALE ANSES EFSA - 9 DECEMBRE 2019



# Common Language and Standard

**Data categorization management**

List of existing categories

Categories (552)

Search

- Apiary
  - Location
    - Name
    - Number of bee colonies
    - Orientation
    - Photo
    - Status
    - Type
    - can\_be\_removed
    - Bee colony
  - Beekeeper
    - Beekeeper ID
    - Beekeeper since
    - Company
    - Date of birth
    - Email
    - Gender
    - Inspection role
    - Location
    - Method
    - Name
    - Photo
    - Role
    - Telephone
    - Disorder
      - Laboratory test
      - Severity
      - Treatment
      - Type
      - Varroa
    - Food
    - Hive
      - Production
      - Honey
      - Other
    - Weather

**Edit**

apiry / number\_of\_bee\_colonies

**Identifier & icon:**

**Parent & type:**

**Translations**

**English:** Grade (1-10) | min:1 | max:10 | decimals:0

**Dutch:** Hive name

**German:** Image

**Danish:** Label

**Fresh:** List

**Description:** List item

**Input Type:** Number

**Physical quantity (unit):** Number 0 decimals (whole) | decimals:0

**Information source:** Number 1 decimal | decimals:1

**Old (fixed) category ID:** Number 2 decimal | decimals:2

Number 3 decimal | decimals:3

Number degrees | min:-180 | max:180 | decimals:0

Number negative | max:0

Number percentage | min:0 | max:100

Number positive | min:0

Numeric slider (0-100) | min:0 | max:100

Options

Score (0-5) | min:1 | max:5 | decimals:0

Score quality (poor-excellent) | min:1 | max:4 | decimals:0

Score severity (low-extreme) | min:1 | max:4 | decimals:0

Select apiary popup

Select continent

Select country

Select hive layer frame popup

Select hive layer popup

Select hive popup

Select location popup

Smileys (3) | min:1 | max:3 | decimals:0

Text

Nick Name

06/06/15

100%

**Stores**

Frames: 5.5 | Pollen: Medium | Feed: Candy | ALERT

**Brood**

Frames: 5 | Eggs: YES | Fresh: NO | Capped: YES

**Queen**

Present: Yes | Cups: 2 | Cells: No | ALERT

**Mood**

☺ ☹ ☹ ☹ ☹ ☹

**Varroa**

Treatment: API Guard | Count: 5 per cm | ALERT

**Config**

☰ ☰ ☰ ☰

**Weather**

☀ ☁ ☁ ☁ ☁ 20°C

**Notes**

Colony not strong enough maybe?

**Health**

- Chalk Brood
- AFB
- EFB
- DWV
- CBP V
- Irregular brood
- Consuming jelly
- Strange smell
- Wax moth
- Hive beetle

Open source bee monitor 2018 - BEEP Foundation



# BEEXML = Common Language and Standard

- Obviously the first agreement we have implicitly made is that the exported data would be provided in **XML format**
- To be **universally understandable**, the proposal for the standard would use **english** element names for the minimum data set
- Optimal minimal set of data:
  - hive data require a **hive ID**
  - **location**
  - **date and time of the observation**
  - **source of the data**

# STATE OF THE ART

## APIMONDIA MONTRÉAL (Sept 2019)

meeting of the Apimondia Working Group #15 (AWG15) - Standardization of data on bees and beekeeping. STEPS:

1. create a minimal BeeXML dataset
2. Identification of commonalities in databases, e.g. Date, Hive ID, Apiary ID, Observer, Recorder
3. Agree on definitions: e.g. what is a colony?

**NEXT MEETING - Next week in Munich!!**

# THE BEE HUB

Proof of Concept (PoC) for an integrated big data  
platform on pollinators



# THE BEE HUB

Initiative of BEELIFE European Beekeeping  
Coordination - [www.bee-life.eu](http://www.bee-life.eu)



Noa Simon Delso  
Data interpretation  
Data gathering



Andrés Salazar  
Data communication and  
accessibility



Gregor Susanj  
Bee Hub architect  
and developer

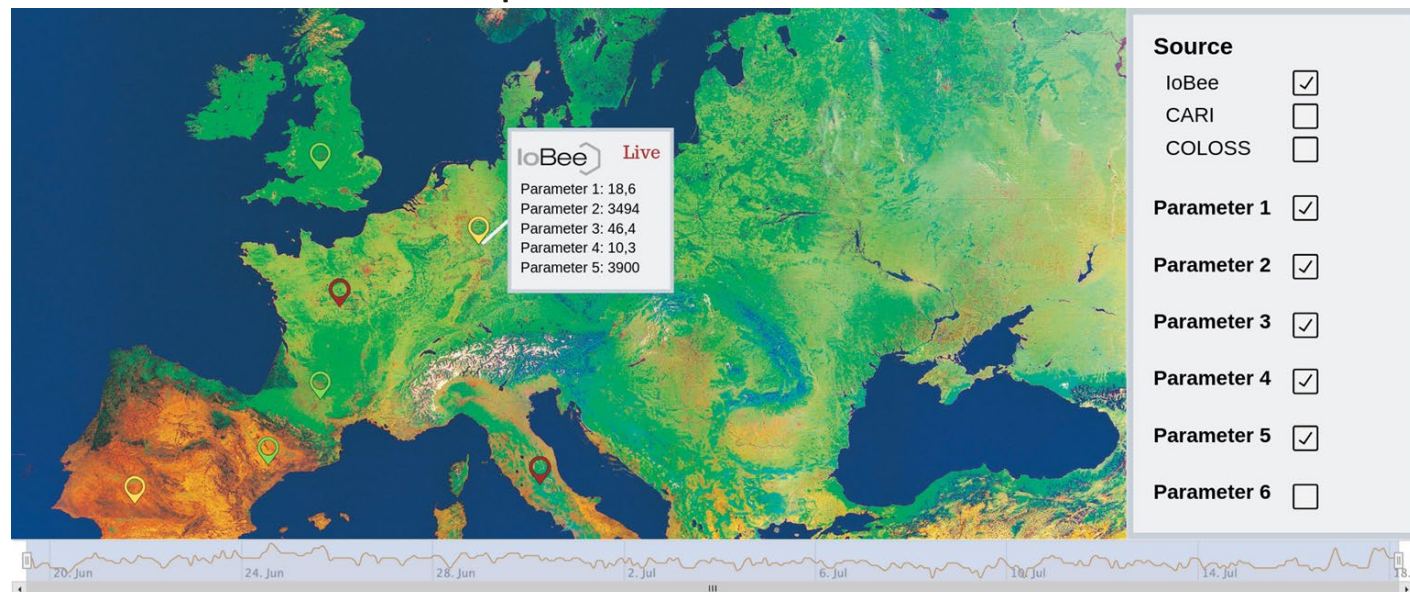




# THE BEE HUB

European (even worldwide) platform that integrates any relevant data linked to pollinators which specialises in bees.

A user-friendly and accessible platform to monitor the status of pollinators in real-time.



# Rationale and objectives

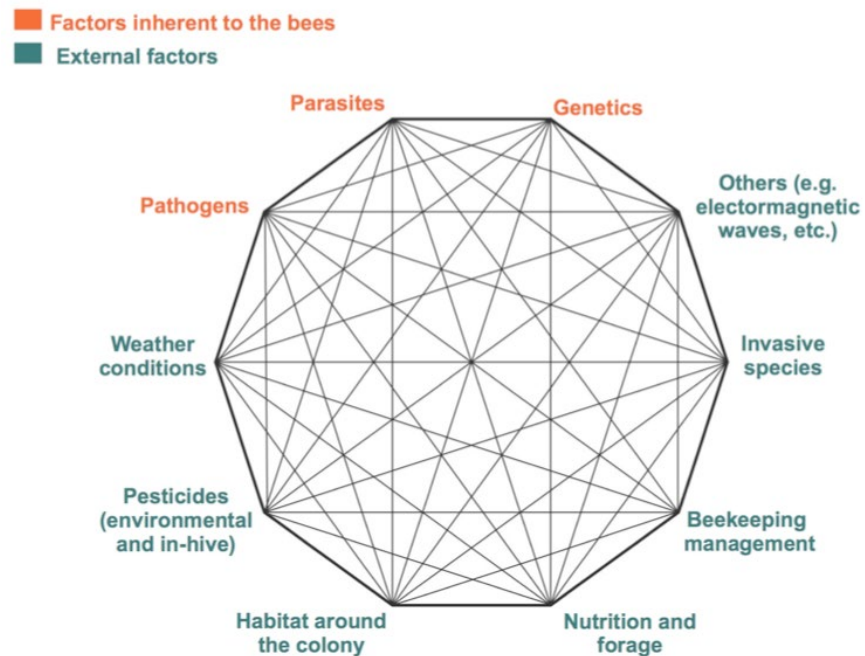
- Useful and effective **tool** in **data gathering/sharing/processing/communication**
- Its focus relies on a non-profit, open, accessible scheme
- **Collaborative tool** in which beekeepers, monitoring device producers, institutions and/or research centres see a new level of cooperation
- Interdisciplinary approach, reliable and objective
- Starts simple and in the future it aims to integrate any bee-related data
- End users:
  - Field practitioners: beekeepers, veterinarians or naturalists.
  - Researchers
  - General public
  - Policy makers
  - Industry

# Data integration

PoC integrates:

- Two initial sources from beehive digital monitoring (LIVE DATA)
  - Data from IoBee field tests (BE, FR, IT, RO, ES, SE) - Arnia
  - Data from CARI and Danish beekeepers (BE, DK, SE, FI) - CAPAZ
- Two other sources of data (STATIC DATA)
  - COLOSS data - Belgium
  - varroa counts -

[bienengesundheit.at](http://bienengesundheit.at)



Factors affecting bee health and interesting to be integrated. Source: Simon Delso 2017

# Privacy and data management

- Not interested in personal data of the data owners
- A tool of integration and visualization of bee related data, but does not own the data itself
  - Data owners decide if they want to share the data or when to share the data
  - Data owners are informed about what is done with their data
  - Data owners can provide feedback anytime on the use of their data by the Bee Hub
- Data could be available to researchers, governments and commercial organization under a common license agreement, with knowledge sharing back to the bee community

# CHALLENGES AND OPPORTUNITIES

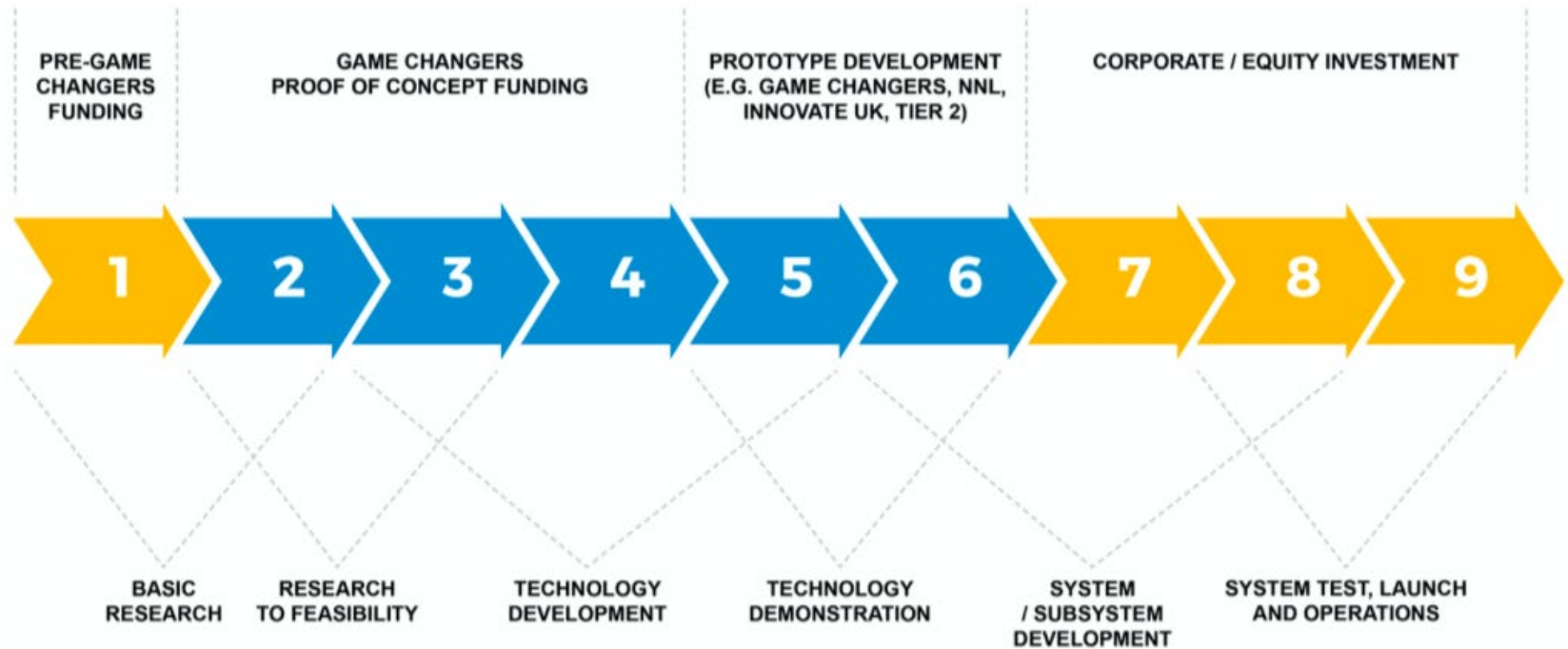
## Opportunities

- Analysis and reporting of data for better decision making
- Development of the Genius Hive
- All can learn from the anonymized data
- Efficiency in data sharing

## Challenges

- Commercial incentives are to own the data, likely leading to near monopoly control if one group owned all the data (e.g. Google)
- Agreement on that standard, and what is important to collect
- Lack of APIs developpement
- Privacy Issues

# Following steps



## Guide to Technology Readiness Levels for the NDA Estate and its Supply Chain

# THANK YOU FOR YOUR ATTENTION

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(cazierja@appstate.edu)

THE BEE HUB - Noa Simon Delso (simon@bee-life.eu), BeeLife (info@bee-life.eu)

