

EU Pollinator Hub Workshop on Data Sharing and Standardisation

WORKSHOP REPORT

1st December 2022, 14:00 - 18:00
Brussels, Belgium (Online)

In collaboration with:



EXECUTIVE SUMMARY

On 2 December, the EU Pollinator Hub - Workshop on Data Sharing and Standardisation, organised by the European Food Safety Authority (EFSA) and BeeLife, occurred online. The event aimed to discuss with European stakeholders related to bees, beekeeping and insect pollinators about their experience in data sharing and their needs towards the EU Pollinator Hub. Participation in the workshop was limited and invitation-based, for it was meant to be interactive and aimed at co-creation among the participants.

More than 60 participants from various stakeholder groups gathered online. They exchanged their experience in insect pollinator-related data collection and standardisation and detailed views on developing the EU Pollinator Hub further. This online platform will be fully operational by 2024, centralising standardised pollinators-related data from all across Europe.

The event started with a plenary session with presentations about the European data policy framework and data collection efforts, setting the scene for an engaging afternoon. First, Agnes Rortais, senior scientific officer at EFSA, presented EFSA's efforts to improve sharing data on insect pollinators and the EU Bee Partnership achievements. Joeri Robbrecht, the European Commission's officer, introduced the instruments available in the EU framework for data sharing, data reuse and interoperability and the [INSPIRE](#) and [Open Data Directives \(2019\)](#). Marie-Pierre Chauzat, Deputy Head of the European Reference Laboratory for Honey Bee Health (ANSES), continued and gave further insights into the collaborative work developed among European national reference labs within the [EPILOBEE](#) project. Noa Simon Delso, Scientific Director of BeeLife, closed the introductory presentations by presenting participants with the EU Pollinator Hub, an online platform financed by EFSA centralising existing information about insect pollinators' health and the factors affecting it.

After the plenary presentations, participants were divided into four groups according to their field of expertise and stakeholder group: (1) Decision makers from Member States and public institutions; (2) Academia; (3) Field practitioners, Beekeeping, Industry, and Veterinarian organisations; (4) Producers/Users of software and hardware of insect pollinator monitoring.

The first break-out session aimed to discuss their experiences in data sharing and their needs as pollinator data collectors and possible providers of the EU Pollinator Hub. The participants raised many valuable points about their difficulties when sharing their data. Among others, confidentiality and privacy issues were mentioned by all different stakeholder groups. Some of them also highlighted the problem of time limitations in research projects. Discussions were also focused on the necessity for standardisation ([BeeXML](#) data standardisation already exists), avoiding data duplication and the topic of orphaned data.

A second break-out session aimed at understanding participants' needs as end users of the EU Pollinator Hub. Participants would be interested to see a lot of different data types on the EU Pollinator Hub. One of the most requested fields of information was bee health, e.g., honey bee diseases, pathogen/predators (invasive species) distribution, colony losses and Varroa treatments. Participants were also keen to see data on wild insect pollinators and their diversity and distribution. Furthermore, attendees would like to see data on crop rotation and beekeeping practices. The utmost importance of the need for pesticide data on a European and local level was also raised.

The possible communication options from the EU Pollinator Hub are under development, but all participants agreed they would be interested in some news from the platform. A newsletter or a new data alert could be developed, but users mentioned they don't want to be overwhelmed with the information arriving from the Hub. That's why it is really important and recommended to develop filtering options when designing the newsletter or notification system.

The different needs to be fulfilled by the Hub were showing a diverse picture. People would be interested in using the platform for data storage, helping give them guidance, and seeing historical data from previous research results. The EU Pollinator Hub is ready to develop APIs, connect the Hub with other platforms and visualise live data on the site. This feature would definitely be welcomed by users.

The full summary of the different needs of the stakeholders [can checked in the summary slides](#) that participants put together at the end of each breakout session and moderators presented in the plenary at the end of the meeting.

BeeLife European Beekeeping Coordination and EFSA thanked all participants for the fruitful event, which will help continue improving and developing the EU Pollinator Hub.

Participants were invited to contact BeeLife at info@bee-life.eu if they wanted to be part of the growing community and share their pollinator data with the Hub.

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INTRODUCTION

Despite the ongoing and almost global challenges faced by insect pollinators, there is no simple and freely accessible knowledge-base solution providing high-quality data and information on this topic. There is also a lack of efforts to develop the analytic capacities necessary to transform the wealth of available pollinator- and other environmental-related data into valid information. As a result, finding providers that meet the quality requirements of all stakeholders involved in investigating, exploiting and protecting pollinators is even more challenging. Furthermore, there is a lack of a comprehensive, output-driven and up-to-date overview of ecologically and economically relevant information on insect pollinators and pollination. The situation hampers the implementation and evaluation of efficient, evidence-based policies, limits risk assessment of possible stressors (i.e. pesticides, GMOs, invasive species, etc.), and the identification and accurate framing of research projects aimed at improving the condition of insect pollinators.

For this reason, the EU Pollinator Hub has been developed since 2019, bringing together any insect pollinator-related data, curating and standardising them to merge observations and extract useful information for decision-making. However, the efforts of such a tool can only thrive if the community working on bees, beekeeping, and pollination-related issues collaborates with the tool, uses it and becomes a data provider. For this reason, on the 1st of December, a Workshop on Data Sharing and Standardisation of the EU Pollinator Hub was organised by the European Food Safety Authority (EFSA) and BeeLife. The objective of the work was to increase the knowledge and recognition of the platform while creating a data-sharing community and promoting data standards. For so doing, the event aimed to discuss with the stakeholders their experience in data sharing and their needs towards the EU Pollinator Hub should they eventually become data providers or platform users. The online platform will be fully operational by 2024, centralising standardised European insect pollinator-related data. This workshop helps shape the development of the Hub by identifying special features that answer the needs of its potential users.

METHODOLOGY

The event was not open to the public, and participation was by invitation only. This was because the organisers aimed for an interactive and co-creating event in which participants became real actors and interacted with each other. Consequently, the participation needed to be restricted to a selected number of experts. For this reason, before the event, the organisers screened for institutions all over Europe generating insect pollinator-related data. From the initiative guest list, more than 60 people accepted the invitation and participated online from all over Europe. Participants were divided into 4 different breakout groups based on the stakeholder category they belonged to (1) Decision Makers from Member States and Public Institutions; (2) Academia: researchers from EU-funded projects, COLOSS members, and other research networks; (3) Field practitioners, Beekeeping, Industry, and Veterinarian organisations; (4) Producers/Users of software and hardware of insect pollinator monitoring.

The agenda of the workshop can be found hereby.

| Agenda | | |
|---------------|--|--|
| Time | Activity | Speakers |
| 14:00 - 14:05 | Welcome from the host | Steve Pagani, EFSA |
| 14:05 - 14:45 | Setting the scene: Efforts to improve sharing data on insect pollinators The power of data for decision making Honey bee data The EU Pollinator Hub | Agnes Rortais, EFSA Joeri Robbrecht, DG ENVI Marie-Pierre Chauzat, ANSES Noa Simon Delso, BeeLife |
| 14:45 - 14:50 | Presentation of parallel sessions | Steve Pagani, EFSA |
| 14:50 - 15:50 | 4 parallel sessions TOPIC 1: What conditions need to be in place for you to share your data? | Moderator: EU Bee Partnership members Rapporteur: EUBP project partners Anne Alix, Corteva Michael Rubinigg, Steirischer Landsverband für Bienenzucht Martin Dermine, PAN Europe Gilles San Martin, CRA-W Walter Haefeker, EPBA Kata Gócs, BeeLife Noa Simon, BeeLife Gregor Susanj, Zip Solutions |
| 15:50 - 16:15 | Coffee break | |
| 16:15 - 17:15 | Continue the parallel sessions TOPIC 2: What needs do you have as a user? | |
| 17:15 - 18:00 | Report from sessions and take-home messages | Stephen Pagani + group moderators |

As shown in the agenda, the event started with a plenary session where the overall framework of the EU Pollinator Hub was presented as well as the European policy field, setting the scene for an engaging afternoon discussion. First, Agnes Rortais, senior scientific officer at EFSA, set the scene and motivation for the workshop with the inspiring quote from Edgar Cahn: “*We have what we need if we use what we have*”. This is the motto of the EU Pollinator Hub and its philosophy: Let’s bring together all the good jobs done so far by so many people. Then, she presented the efforts already developed by EFSA and the [EU Bee Partnership](#) to improve data sharing on insect pollinators. Presentation by Agnes Rortais, EFSA - [Setting the scene: Efforts to improve sharing data on insect pollinators](#)

Her presentation was followed by Joeri Robbrecht from the European Commission's Directorate-General for Environment (DG ENVI). He introduced the participants to the different instruments available in the EU framework for data sharing, reuse and interoperability. He introduced the possibilities for the Hub in the [INSPIRE Directive](#) and the [Open Data Directive \(2019\)](#). Presentation by Joeri Robbrecht, DG AGRI - [A European Common Data space where data flows freely](#)

Marie-Pierre Chauzat, Deputy Head of the European Reference Laboratory for Honeybee Health ([ANSES](#)), continued and gave further insights into the work developed when coordinating the [EPILOBEE](#) project in sharing and standardising protocols among official veterinarians.

The presentations were closed by Noa Simon Delso, Scientific Director of BeeLife, who introduced participants to the EU Pollinator Hub, its objective, features and development status. The new online platform, financed by EFSA, centralises existing information on insect pollinators' health, beekeeping and pollination. Presentation by Noa Simon, BeeLife - [The EU Pollinator Hub](#).

After these presentations, participants were divided into four groups to discuss their experiences and needs as pollinator data collectors and possible providers of the EU Pollinator Hub. The following stakeholder groups were formed:

1. Decision Makers from Member States and Public Institutions;
2. Academia: researchers from EU-funded projects, COLOSS members, and other research networks;
3. Field practitioners, Beekeeping, Industry, and Veterinarian Organisations;
4. Producers/Users of Software and Hardware of Insect Pollinator Monitoring.

Two exchange sessions were held for 1 hour and a half duration. The first one aimed to understand the conditions needed to be in place for participants to share their data with the EU Pollinator Hub. The moderator of each group explained the session's objective and proposed an icebreaker to the participants (approx. 10 minutes). It consists of two questions that help set up the break-out topic scene. Mentimeter was used to collect the answers so that the participants' reactions were instantly shared with the group. The questions were:

1. If you are involved in collecting insect pollinator-related data, please describe which type of data. A set of pre-given answers was proposed, among which participants could choose multiple options.
2. What is the added value in your opinion of data sharing? Here, participants could answer freely.

The answers are provided in the following section. A short exchange of the results was shared with each of the break our groups and served as an ice-breaker.

The ice-breaker was followed by the discussion session (40 minutes) in which the moderators led the participants to share their views and exchange on the following questions, which had been pre-written on a whiteboard used to accommodate the participants' answers:

1. Do you have experience with data sharing or data sharing platforms? Please share it with group
2. What is/would be your motivation for data sharing? / What prevents you from sharing your data?
3. Sometimes there are legal data sharing issues (e.g., data ownership, confidentiality, etc.) → Do you have suggestions to overcome the problem?

Break-out moderators initially invited participants to reflect individually for 1-2 minutes on these questions, and then each participant was invited to present their reflections for 1-2 minutes. The moderator provoked debate or exchange of experiences among the participants, while note-takers allocated to each of the breakout sessions noted the interventions and ideas of the participants.

After the 40-minute exchange, each break-out session finished with the participants co-creating a summary slide with the main ideas discussed during the session (10 minutes). The layout and organisation of slides for each break-out session had been prepared in advance.

Participants had a 25-minute virtual coffee break, after which they resummoned for the second breakout session, aiming to understand the needs they would have should they become end-users of the EU Pollinator Hub. Again, these sessions started with a short introduction of the objective and an icebreaker. This time, the icebreaker aimed to understand:

1. How would you prefer to access the information in the EU Pollinator Hub? A set of answers is pre-given for choice: Interactive graphs/maps, Databases, Reports, All of them.
2. The following are features that the EU Pollinator Hub will integrate. Please rank the features according to your criteria of relevance. Answers are pre-given: Dataset research and download tool; Information on privacy and data ownership; Multi-language platform; Rating system and feedback tool; Maps, charts and other visualisations.

Similarly, as in the previous session, moderators invited participants to reflect for 2-3 minutes on the questions below, present their views for 2-3 minutes each and debate about the answers provided (45 minutes).

1. What kind of services would you be interested in? E.g., data quality checks, peer review of your data (doi), data visualisation, reporting, etc.
2. What kind of datasets/information would you be interested in?
3. Would you like reports or communications from the Hub as a registered user? (e.g., novelties in your location, new datasets available in the Hub, etc.).
4. What needs would you like to fulfil with the EU Pollinator Hub?

After the 45-minute exchange, each break-out session finished with the participants co-creating a summary slide with the main ideas discussed during the session (10 minutes). The layout and organisation of slides for each break-out session had been prepared in advance.

Participants finalised the breakout sessions and returned to the plenary, where moderators presented the summary slides prepared for the eight breakout sessions (24 minutes, 6 minutes/moderator). Finally, Steve Pagani from EFSA summarised the outcome of all the slides, provided the participants with an overview of the next steps in developing the EU Pollinator Hub and thanked everybody for their participation and contribution to the event.

RESULTS

1. FEEDBACK FROM THE FIRST BREAK OUT SESSIONS

1.1. MENTIMETERS OF THE DIFFERENT GROUPS

The first breakout session was dedicated to discussing what would be needed if participants became EU Pollinator Hub data providers. From the Mentimeter icebreakers, we learned that participants were involved in data collection related to insect pollinators, mainly the groups from academia, field experts and national

research centres. The data collected ranged from beekeeping management practices, agricultural management practices, nectar flow and hive conditions, pollinator population monitoring, pesticide exposure, land use and landscape composition, pathogens and parasites, and weather. A minority claimed they were collecting other sorts of data but did not provide more information.

As for the added value participants recognised in data sharing, there is data reuse for collaboration, research use, learning, and verification of the data analyses already performed; lower cost and improve the efficiency of the data generated; to perform better-informed decisions; to get more knowledge about problems in other areas, and compare results from different areas or years, perform meta-analyses and surveys at the European level. Others recognised the increased efficiency that may come from using standardised and centralised data, the possibility of providing scientific validation of datasets, and having a big data approach to insect pollinator-related problems. Finally, academia identified the possibility of teamwork in data analysis.

1.2. FEEDBACK FROM MODERATORS ON THE DISCUSSION AND EXCHANGES

The four moderators for each breakout group (each person is a member of the EU Bee Partnership) presented the summaries from their groups in two slides. They discussed what, in their opinion, were the main take-home messages in their breakout sessions.

Decision Makers from Member States and Public Institutions

Anne Alix (CropLife representative, EU Bee Partnership member) moderated the group “Decision Makers from Member States and Public Institutions”, and notes were taken by Michael Rubinigg (EU Pollinator Hub Team). The following slide summarises the discussion of the first session of this breakout group.



I. Summary - First session - Moderator: Anne

- Do you have experience with data sharing or data sharing platforms and suggestions for improvements?
 - Use best practice guidelines to facilitate sharing (SOP, GLP)
 - Prevent misuse or misinterpretation
- What is/would be your motivation for data sharing?
 - Utilization of data for prediction and prevention of spread of diseases and threats
 - Share in exchange for data from other providers
 - Interest of data from beekeepers
 - Give data that can have value in a bigger context
- Which legal issues in sharing data do you see?
 - Legal constraints for data sharing (GDPR compliance)
 - Position data as critical issue
- What prevents you from sharing data?
 - Publication of data contrasts with policies of editors
 - Confidentiality, privacy, time management for data providers

The participants in this group also remained high-level in their feedback but proposed some concrete actions. They raised the need to have guidelines and clarity about data sharing and how it is done to avoid misuse/misinterpretation and a common understanding when people share their data with the platform (through Standard Operating Procedures (SOPs) or Good Laboratory Practices (GLPs)).

Regarding the motivation to share data, participants mentioned the opportunity to avoid the further spread of pests whenever up-to-date data is available. Beekeepers need data on practices and factors that affect their animals' good health. But their data can be helpful for someone else or give us a bigger picture of the field situation.

Limitations for data sharing are (1) privacy issues (including GDPR and location data of the apiary), (2) the publication of data conflicts with the journal editor's policy, (3) confidentiality issues, and (4) time shortage of data holders.

Academia

Martin Dermine (PAN Europe representative, EU Bee Partnership member) moderated the group of "Academia", and notes were taken by Gilles San Martin (EU Pollinator Hub Team). The following slide summarises the discussion of the first session of this breakout group.



I. Summary - First session - Moderator: Martin

- Motivations for data sharing :
 - Having access to other's data to better interpret your own data + reciprocity (giving for receiving)
 - Better open scientific process (open data with every published paper): reproducibility, errors can be spotted by others... but uncomfortable to be scrutinized
 - Datasets can be considered as publications (DOI)
- Motivation for not sharing + issues
 - Time consuming + difficulty and boringness of standardisation (Maybe better we encode the data directly into a standard → less time consuming + better data quality)
 - Collecting data is a lot of work + Publish or perish → we want to exploit as much as possible the data by ourselves (even if in the end we often don't have the time)
 - Commercial use / patents → you might need embargo on the data or not be able to share everything
- Legal problems should be fixed by the legal department of the data collecting institution (contract) but consent not transitive to other people → sometimes difficult to share data further

The group discussed motivations and blockers for data sharing, discussing these in detail. The former was the possibility to interpret one's data better, imprint transparency in the scientific process, reproducibility, and errors. The latter was the time needed for data sharing and the difficulty and tediousness of the standardisation process, the need for researchers to publish, hampering data to being publicly available before it gets published in a journal, or the existence of data for commercial use or patents, which may require an embargo. Finally,

legal issues on using data by third parties also lock the publication or transfer of data already used in projects or used for publication.

Field practitioners, Beekeeping, Industry, and Veterinarian organisations

Walter Haefeker (EPBA representative, member of the EU Bee Partnership) moderated the group “Public and national institutions, national research institutions”, and the notes were taken by Kata Gocs (EU Pollinator Hub Team). The following slide summarises the discussion of the first session of this breakout group.



I. Summary - First session - Moderator: Walter

- Publicly funded projects → requirement that data needs to be contributed to the EU Pollinator Hub in a STANDARDISED/harmonised way ([BeeXML](#) - international)
- What happens with data when a project is finished? - The EU Pollinator Hub is there to avoid “orphaned” data
- Publicly available data through the internet (it is not enough)--> need to have a hub where people can find it and make use out of it
- Having a standard and a hub → avoid reinventing data storing → Guidance is already there [BeeXML](#), EU Pollinator Hub is there to store → no need to invent a new data structure
- API is available (possible to design) to be designed to link other platforms with the EU Pollinator Hub
- Access of data is a technical, legal and motivation question (do I want , am I allowed to share data?)
- Increase motivation to share data by addressing privacy issues. - take covid tracing apps as example. Datasource is always anonymised, the source should never traceable
- Work together with the EU Pollinator Monitoring Scheme is ongoing → no duplications

The overall interactions were positive and constructive, for the group members were knowledgeable about the topic, even though they discussed high-level issues and not technical ones, e.g., data from publicly funded projects. The group did not know about the BeeXML standardisation group and efforts. Furthermore, the group was informed about the role and utility of the EU Pollinator Hub. Orphaned data was also discussed to reduce or integrate them into the Hub. Discussions were also focused on the necessity for standardisation ([BeeXML](#) data standardisation already exists), avoiding data duplication and the topic of orphaned data.

Some participants mentioned they make data publicly available on their ministry website (e.g., The Netherlands or France). There was a discussion among the participants about how to engage them to share it with the EU Pollinator Hub.

Participants agreed that there should be a requirement for publicly funded projects to provide the data generated to the EU. When new projects start, it would be ideal to use the EU Pollinator Hub as a centralised storage place or standardised data to ensure the future usability of the generated data. In doing so, duplication would be avoided.

Finally, integrating the real-time data through APIs (Automated Programme Interfaces) and providing the EU Pollinator Hub with one would also be welcomed to ensure interoperability and communication among technological systems.

Producers/Users of Software and Hardware of Insect Pollinator Monitoring.

Noa Simon Delso (BeeLife representative, EU Bee Partnership member) moderated the group of “Field experts, Software, hardware, and industry”, and notes were taken by Gregor Susanj (EU Pollinator Hub Team). The following slide summarises the discussion of the first session of this breakout group.



I. Summary - First session - Moderator: Noa

- The field practitioners have experience with data sharing related to bee health, production and beekeeping data.
- Motivation for data sharing:
 - avoiding data duplication
 - answering individual, thematic, well defined questions
 - immediate feedback feels important
 - Contextualize observations to interpret correctly the data.
- Motivations for not sharing data:
 - licencing, intellectual property ,
 - feeling of losing control of the data
 - lack of well defined consortium data sharing agreements
 - Lack of resources.
- Better understanding of practical implementation GDPR is required to avoid becoming a large obstacle for many researchers and the industry.

This group was composed of people with extensive experience in data collection and sharing, and discussions went into detail. They already know about the EU Pollinator Hub. They saw the interest in data sharing to avoid duplication and answer individual or thematic questions. They identified the provision of immediate feedback on the data shared as necessary by the data provider and the need to contextualise observations to interpret data correctly. They felt that the over-conservative interpretation and implementation of GDPR is a significant obstacle for many researchers and field industries to get or share data.

However, they had experienced problems with licensing and intellectual property and a lack of resources to share the data. They felt they were losing data control due to the need for more well-defined data-sharing agreements.

2. FEEDBACK FROM THE SECOND BREAKOUT SESSIONS

The second breakout session was dedicated to reflecting on the participants’ needs should they were to become end users of the platform.

2.1. MENTIMETERS OF THE DIFFERENT GROUPS

The Mentimeters revealed that participants were interested in accessing the information in the EU Pollinator Hub via interactive graphs/maps, databases and reports. Academia representatives provided more priority to features related to dataset research and download tools, leaving features related to visualisation and information on privacy and data ownership is less relevant. Academia seems more comfortable with having an English-based platform. The prioritisation for feature development was slightly different for field practitioners, who provided more priority to visualisation and rating systems, feedback tools and multi-language platforms.

2.2. FEEDBACK FROM MODERATORS ON THE DISCUSSION AND EXCHANGES

Decision Makers from Member States and Public Institutions

Representatives from Ministries and public institutions would be interested in a shelf-life tool. User-friendly with access to attractive and informative visualisations, with the possibility to use filters and customisations. They need mainly data contextualisation, interoperable, accessible and standardised. As potential end users of the platform, participants People want to see the platform as a long-term tool.

Language is an issue as field practitioners do not necessarily speak other languages.

Participants were interested in having information about diseases, pathogens, invasive species, e.g., the Asian hornet, beekeeping practices, weather, pesticide use, and honey quality.

II. Summary - Second session - Moderator: Anne



- What kind of services would you be interested in?
 - shelf life of the tool
 - user friendly visualisation, user centered design, one language vs. translations
 - standardisation/interoperability/accessibility
- What kind of datasets/information would you be interested in?
 - diseases, pathogen/predators (invasive species) distribution
 - pollinator diversity and distribution
 - beekeeping practices
 - link different data layers/datasets
- As a registered user, would you be interested in reports of communication from the Hub?
 - newsletter/specific updates on datasets
 - API for automated data sharing in both directions
- As a registered user, would you be interested in reports of communication from the Hub?
 - advocacy
 - contextualisation of data

Academia

For Academia, they are mainly interested in open, downloadable, reusable data of ensured quality. They are also interested in data standards or formats; the datasets get a doi and can be cited on their own. Again, they are interested in historical and real-time data, bee health data, pesticide and farming practices, pests and pathogens, etc. As registered users, they would be interested in reports related to bee health, with the possibility of filtering the news to avoid spamming. The issue of GDPR also came up in this group, needing the EU Pollinator Hub to provide guidance.

II. Summary - Second session - Moderator: Martin



- What kind of services would you be interested in ?
 - Open data, downloadable and reusable, with quality checks and standardised
 - Data standards / formats → to be used for new data collection
 - DOIs/citation for each dataset provided
- What kind of datasets/information would you be interested in?
 - Both historic data and real time data uploaded regularly (+alerts)
 - Bee health/mortality and colony development, pesticides and farming practices, pests and pathogens, bee activity, food resources, land use, sensors data (eg in-hive) ...
- As a registered user, would you be interested in reports or communications from the Hub?
 - If yes, with good filtering options to avoid overload/spamming
 - Alerts for bee health problems eg outbreaks of diseases, unusual mortality events,...
- What needs would you like to fulfil with the EU Pollinator Hub?
 - Open data accessibility (as a user) and diffusion (as a provider)
 - User friendly and not too much time consuming
 - API for real time data access

Field practitioners, Beekeeping, Industry, and Veterinarian organisations

Representatives of public research institutions were interested in maps, visualisations, reports or citation tools for publications, especially on wild bees and managed bees populations over time, varroa treatments, pesticide use at the EU level, American Foulbrood outbreaks or management practices, among others. There is a clear interest in such outcomes from the EU Pollinator Hub, and as data providers, participants show it as interesting to know how often and by whom their data were accessed/used.

Participants would like the EU Pollinator Hub to provide historical data, long-term availability of project data, comparable data among member states, and guidance on data collection, standardisation and storage.

II. Summary - Second session - Moderator: Walter

What kind of services: Maps / visualisation / reports / citation tool for publication - e.g.: on periodical health of pollinators, weather, population densities, professional vs non-professional ("hobby") bee holdings

What kind of services would you be interested in? - Data on wild bees, Evolution of the number of pollinator populations between years, and loss of bee colonies, VARROA TREATMENTS, **Pesticide use in EU level**, American FOULBROOD Circles, data on crop rotation, **management practices**, data on planned spraying of pesticides

Would you be interested in reports of communication from the Hub? - YES!

Also reports about how frequently my data sets are accessed and who is accessing the data. Local alert system for beekeepers/vets (possible option to regional or smaller level).

What needs would you like to fulfil with the EU Pollinator Hub? - Historical data, long availability of project data, comparable data among member states, complete missing data faster access to the data (no need to look for everywhere on the net) guidance on how to store data to compare them, **guidance**, data storing

Producers/Users of Software and Hardware of Insect Pollinator Monitoring.

Field experts were much more interested in socio-economic information about the beekeeping, farming and industry sectors, getting access to data describing the context of field observations and problematic symptoms described by beekeepers. They were keen on getting a service helping them standardise their data, provide other uses to their datasets and have access to other databases. They were interested to know about novelties included in the Hub, like new datasets or reports published).

II. Summary - Second session - Moderator: Noa

- **Data of interest:** Socio-economic about the beekeeping sector, contextual information (land use, environment), honey bee colony development, symptoms described by beekeepers.
- **Services of interest:** Primarily on standardization services and access to other databases. Access to information about possible issues within a dataset.
- **Reports and Communication on Hub:** YES, about novelties included in the hub (data availability, new datasets, etc.)
- **Needs to fulfill:**
 - Services for standardization and protocols for the metadata.
 - A need to provide answers by crossing relevant data on questions that stakeholders would have related to pollinators.

RECOMMENDATIONS AND CONCLUSIONS

Despite the fact that many participants came for the first time in contact with the EU Pollinator Hub, it raised great interest, and participants revealed to be seeking many different types of data related to pollinators. One of the most requested fields of information was bee health, e.g., honey bee diseases, pathogen/predators (invasive species) distribution, colony losses and Varroa treatments and their context (pesticide exposure, landscape, etc.). Participants were also keen to see data on wild insect pollinators and their diversity and distribution.

The wishlist of the participants serves as a roadmap or priority list for data hunting from EFSA and the Team developing the EU Pollinator Hub. The Team will also use the feedback provided within the workshop to prioritise the features to be developed within the Hub.

The possible communication options from the EU Pollinator Hub are under development, but all participants agreed they would be interested in some news from the platform. A newsletter or a new data alert could be developed, but users mentioned they do not want to be overwhelmed with the information arriving from the Hub. That is why it is important to develop filtering options when designing the newsletter or notification system.

The different needs to be fulfilled by the Hub were showing a diverse picture and horizons. Some people would be interested in using the platform for data storage, helping guide them, and seeing historical data from previous research results. Others would be consumers of processed data. The EU Pollinator Hub is ready to develop APIs linking it with other technological platforms and visualising live data on the site.

It could be possible to organise a follow-up conference in 2023 or 2024, showing the advances in the platform and the crystallisation of some of the recommendations provided during the workshop.

APPENDIXES

1. [Presentation Agnes Rortais](#)
2. [Presentation Joeri Robbrecht](#)
3. **Presentation Marie-Pierre Chauzat**
4. [Presentation Noa Simón Delso](#)



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