European Network for Rural Development

BeeScanning - an app for protecting bee colonies

EAFRD-funded projects

BeeScanning app combines the use of artificial intelligence and smartphones, enabling beekeepers to easily detect Varroa mites and reduce the risk of death in their bee communities.

SWEDEN

Farm's performance, restructuring & modernisation

Location
Lindesberg

Programming period
2014 – 2020

Priority
P2 – Competitiveness

Measure
M16 - Cooperation

Funding (EUR)[1]
Total budget 917 960
EAFRD 401 428
National/Regional 421 170
Other 95 362[2]

Project duration
2017 – 2020

Project promoter[3]
Fribi Holding AB

Contact
fribi@mac.com

Website
https://beescanning.com/

Summary

Bees are a particularly important renewable biological resource contributing not only to honey production but also to pollination, which is vital for all food production. Today, millions of bee communities die every year because of Varroa mites, the deadliest honeybee pests.

To reduce bee mortality and improve the health of bee communities, the BeeScanning app was developed by an EIP-AGRI Operational Group. BeeScanning uses Artificial Intelligence (AI) image analysis to detect Varroa mites. Beekeepers get infestation results together with recommended actions in a fast and user-friendly way using their smartphones. Healthy bees will generate value-added products through honey production and pollination.

Results

The app offers a fast and user-friendly way of detecting Varroa mites in bee communities, without having to use the traditional methods that involve killing bees. No sophisticated equipment is needed since the technique is adapted for smartphones.

The app is available for both iPhones and Androids and can be downloaded in 155 countries all over the world. In April 2019, the app had been downloaded 3 000 times with an average of 50 new users every week.

Lessons & Recommendations

- ❑ The app can be used in all EU countries. The use of the AI technique of analysing images could also be transferred to other areas in agriculture that face similar issues.

[1] BeeScanning has been granted funding at two applications under M16.1
[2] Kickstarter crowdfunding (EUR 10 433) and Vinnova (EUR 84 929).
[3] The Project promoter/beneficiary is an EIP-AGRI Operational Group (https://ec.europa.eu/eip/agriculture/en)

ENRD Contact Point
Rue de la Loi, 38 Boîte n.4 - 1040
Brussels, Belgium
Tel. +32 2 801 38 00
email: info@enrd.eu
website: http://enrd.ec.europa.eu/

Funded by the European Commission

Context

Varroa mites are identified as the deadliest pest to honeybees and kill millions of bee communities every year. The mites transmit the deformed wing virus to larval or pupating bees, resulting in death or severe deformation of bees. The disease is the biggest threat to the survival of bee communities all over the world. If a bee community is infected with the disease, the whole community usually dies within a 3-year period after the first infection.

In a pilot study from 2016, Fribi Holding AB found a correlation between the number of Varroa mites that can be detected with alcohol sampling and what is visible in an image. An EIP-AGRI Operational Group was then formed and started developing the BeeScanning app for beekeepers to use on their smartphone.

Objectives

The main action of the EIP-AGRI project is to develop the app to use on a smartphone. Through the app Varroa mites can be detected and this helps reduce the risk of death in bee communities.

Activities

In 2017, using the finding that the level of infection and imagery are correlated, the EIP-AGRI Operational Group started an in-depth study to evaluate different detection methods for the Varroa mites. The group started to build the app and refine the tool. The app and its AI system was built to detect the Varroa mites through image analysis.

To start the detection process, pictures are snapped at a 21 centimetres distance from live bees on the brood frame. 2-3 brood frames need to be photographed with four photos of each side and a total of eight photos per frame. The photos are then uploaded and analysed by the AI system. The user receives a message showing the percentage of infestation. The app then suggests appropriate actions.

The app is an alternative to traditional methods that involve killing bees to detect the Varroa mites. With this tool no bees need to be killed and there is no risk of harming the queen.

The first version of the BeScanning app was released on 6 June 2018.

Since the first version, the app has been updated 8 times, with improvements such as:

- tutorials for beginners – how pictures should be taken for the best results;
- support messages – where users can get help and send feedback; and
- geopositioning – to save data on locations where infestation levels are low.

During 2019, the project focused on validating a better performance in the existing technology. It also started developing new features for the app. The goal is to be able to diagnose all the important bee diseases, as well as to provide an overall evaluation of bee communities. Video analysis and sound would enable the detection of behaviour and indications of illness that cannot be detected through pictures alone.

A new update of the app, BeeScanning 2.0 is expected to be released in 2020.

Main results

The app offers a fast and user-friendly way of detecting Varroa mites in bee communities, without having to use the traditional methods that involve killing bees. No sophisticated equipment is needed since the technique is adapted for smartphones.

The app is available for both iPhones and Androids and can be downloaded in 155 countries all over the world. By April of 2019, the app had been downloaded 3 000 times with an average of 50 new users a week.

Key lessons

The app can be used in all EU countries. The use of the AI technique of analysing images could be transferred to other areas in agriculture that face similar issues.

Additional sources of information

n/a

Funded by the European Commission