SUSTAINABLE MANAGEMENT OF RESILIENT BEE POPULATIONS

SmartBees Update: Season One

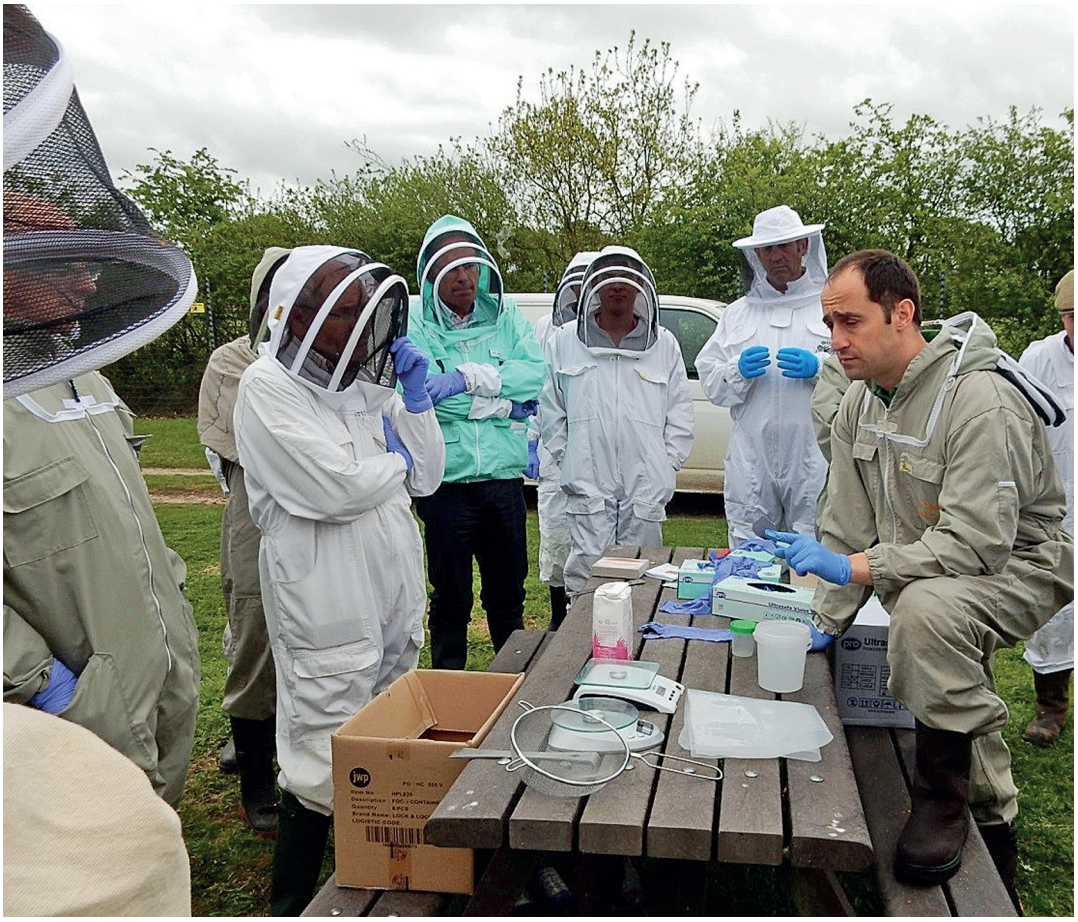
Katherine E Roberts and Jason Learner (National Bee Unit, York)

SmartBees is a collaborative research project between 16 partners from a range of institutes including universities, research organisations and companies across Europe (see May 2015, page 16).

The project seeks to analyse the current level of genetic diversity among Europe's honey bees and understand the critical interactions between bees, the varroa mite and the viruses associated with this host and parasite interaction. The project started on 1 November 2014 and this is an update of the first season's activities on which the National Bee Unit (NBU) has been working.

Crucial Aim

A crucial aim of the SmartBees project is the conservation of local populations and subspecies of honey bee, through their active use. In order to ensure that these local bees are appealing to beekeepers, they need to be bred sustainably for genetic improvement and enhancement of any attractive traits. These include not only the traditional desirable traits beekeepers would look for, such as honey production, calmness and reduced swarming behaviour, but also those that are more specifically related to the interaction of honey bees with varroa and deformed wing virus (DWV). These more specific traits include hygienic behaviour and varroa tolerance and they require procedures for their estimation.



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Dr Aleksandar Uzunov explaining the methods that beekeepers can use to estimate varroa mite levels in their colonies

Protocols and Activities

In order to equip beekeepers with the necessary skill and expertise to breed improved local bees, a range of extensive protocols and activities has been developed by Dr Aleksandar Uzunov and Dr Ralph Büchler, experts from the Kirchhain bee institute (Germany).

More than 150 beekeepers and breeders from 19 European countries have been educated during 12 training events across Europe. These events were managed and run by Dr Uzunov

alongside representatives from the host nations.

Training Day

One of these training events was coordinated and held in York at the National Bee Unit (NBU) in May this year.

Twenty-three participants from diverse regions across the UK were invited to take part in the exercise. Some of these people were from beekeeping associations and some were bee breeders or individual beekeepers. All of them had expressed an interest in taking part in selective breeding of local bee populations and in carrying out field testing of bee traits in order to inform selective breeding.

The training events allowed not just the training of beekeepers and potential breeders, but the development of any necessary adjustments to the testing methods. This ensured that the methods would be suitable for the various European local conditions.

On the training day there were theoretical presentations on breeding and the history of breeding in the UK as well as practical in-field demonstrations of the newly developed breeding and selection methods. The photographs show the field demonstrations of the performance protocols that participants were taught during the event.

A very important part of the day was the dynamic exchange of ideas and constructive debates about the ways in which methods can be adjusted to suit the diversity of different environmental conditions that can be found across the UK and also the culture of beekeeping practices.

These were, and will continue to be, fundamental in order to ensure that the project is manageable and sustainable, but also so that the results of the field testing of the local bees fits the requirements for rigorous statistical analysis of the bees produced.

Demonstration of the best method for recording colony development of a test colony through the estimation of the numbers of frames covered by bees

Demonstration of the hygienic behaviour pin-test protocol

BEEBREED Database

The data from the field testing of the local bees will be input into an online database, BEEBREED (http://www.beebreed.eu/), developed by the Institute for Bee Research, Hohen Neuendorf, Germany. Here, the data will be analysed, standardised and archived in order to provide a 'pedigree' of the bees from the breeding apiaries.

This database will provide a base for estimation of breeding values while meeting the requirements for the local practices undertaken by beekeepers for the best colony management.

Protocols Online

The protocols for the performance testing of colonies and the setting up of apiaries are now available online, on the SmartBees website (http://www.smartbees-fp7.eu/Extension/Performance/), in 11 European languages, in a downloadable free booklet providing all the necessary information for beekeepers and breeders in order to ensure proper implementation of the testing procedure. Currently a number of testing apiaries has been set up across the UK. Despite a difficult season, with variable and often unfavourable weather, there has been some great progress in establishing testing apiaries and engaging beekeepers into the spirit of SmartBees.

Acknowledgement

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Want to Take Part?

If you are interested in taking part or just being kept up to date with activities, we would like to invite you to visit the SmartBees website (www.smartbees-fp7.eu) and the NBU website, Beebase (www.nationalbeeunit.com), for further information and updates.