

A SmartBees Update: Season One

Katherine E Roberts and **Jason Learner**, National Bee Unit, provide an update on progress

SmartBees is a collaborative research project between 16 partners from a range of institutes including universities, research organisations and companies across Europe. The project seeks to analyse the current level of genetic diversity among Europe's honey bees and understand the critical interactions between bees, varroa and the viruses associated with the host and parasite interaction. The project started on 1 November 2014 and this is an update of the first season's activities which

the National Bee Unit (NBU) has been working on.

Local Populations

A crucial aim of the SmartBees project is the conservation of local populations and sub species 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 the traits beekeepers would typically 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). Selection for these more specific traits must include procedures for estimating hygienic behaviour and varroa tolerance.

Skills and Expertise

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

Dr Aleksandar Uzunov explaining the methods that beekeepers can use to estimate Varroa loads in their colonies



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More than 150 beekeepers and breeders from across 19 European countries have been educated through 12 training events. These events were managed and run by Dr Uzunov with the support of representatives from each host nation. One of these training events was held in York at the NBU in May 2015.

Twenty three participants from across the UK were invited to take part in the exercise. Some of these people were from interested beekeeping associations, some were bee breeders and some were 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 enabled not only the training of beekeepers and potential breeders, but also the development of any necessary adjustments to the testing methods. This ensured that the methods would be suitable for varying local conditions across Europe.

On the day of the training there were presentations on breeding and its history in the UK as well as practical in-field demonstrations of the newly developed breeding and selection methods. A very important part of the day was the dynamic exchange of ideas and constructive debates about the ways 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 local bees fits the requirements for rigorous statistical analysis of the bees produced.

Data from the field testing of local bees will be input into an online database 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 whilst meeting the requirements for the local practices of beekeepers for the best colony management.

The protocols for the performance testing of colonies and the setting up of apiaries are now available online and in a downloadable free booklet providing all the necessary information for beekeepers and breeders in order to insure proper



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

implementation of the testing procedure. See the SmartBees website.

Summary

Despite a difficult season, with variable and often unfavourable weather, there has been progress in setting up testing apiaries and engaging beekeepers into the spirit of SmartBees. If anyone is interested in taking part or just being kept up to date with activities we would like to invite you to contact Dr Maureen Wakefield at Fera (maureen.wakefield@fera.co.uk). See also the SmartBees website or the NBU website for further information and updates. □

Links

Online database of the Institute for Bee Research, Hohen Neuendorf, Germany
www.beebreed.eu

SmartBees
www.smartbees-fp7.eu

National Bee Unit
www.nationalbeeunit.com

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