

# Honey Bee Health in the EU: European Union Pilot Surveillance Programme

In 2011 the European Commission (EC) appointed the Sophia-Antipolis Laboratory of ANSES (French National Agency for Sanitary Safety of Food, Environment and Labour) as the first EU Reference Laboratory (EURL) for honey bee health. The EURL's activities are wide ranging (<http://www.anses.fr/index.htm>), but its primary mission is the implementation of a Pilot Surveillance Programme (PSP). The PSP's focus is to collect standard baseline data for over winter and within-season colony losses, and to identify any associated risk factors, i.e. particular pests or diseases, across the EU. Last autumn, Member States (MS) received an invitation to participate in the PSP, stipulating monitoring procedures that would have to be rigorously followed in all countries to ensure comparable data at the end of the project.

The NBU responded to this call on behalf of England and Wales, detailing how we could conduct national surveillance to contribute to the EU-wide dataset sought by the EURL. In late May 2012, we received the excellent news that our proposal met all the EC's requirements. We recognise the high importance of the PSP to our understanding of pan-European honey bee health and are delighted to be undertaking this work on behalf of the UK (England and Wales). The other participants are Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Slovak Republic, Spain and Sweden.

The initial PSP meeting, held in Brussels, was attended by representatives from all participating MS. Opening the meeting, the EC Directorate-General for Health and Consumers explained how this is the first time that such a pan-EU surveillance project has ever been undertaken. The EC has allocated €3.3m to achieve this goal. Key to the success of the project is a harmonised approach, to which all MS must adhere. Although a project of this scale will undoubtedly prove complex, the Directorate emphasised the unique opportunity that the EU PSP affords the international beekeeping community — data from this project will be invaluable in informing the EC's decision-making processes at the highest level.

For the purposes of the PSP, each participating country is required to 'target' the whole national beekeeping population in its surveillance regime, and geographical coverage should address the whole country. Sampling must be randomised to include all beekeeping sectors, i.e. professional and hobbyist, and encompass the various urban or rural landscapes found.

The UK's PSP combines the eight beekeeping regions of England and Wales as two, broad geographical zones, termed 'east' and 'west' respectively (Figure 1). Although due to national and regional boundaries, the density of beekeeping is unequal with the west zone comprising a slightly smaller population, this arrangement still ensures coverage across England and Wales, without imposing unrealistic inspection loads on Appointed Bee Inspectors in single regions. It also ensures that sufficient apiaries identified as at risk of exotic pest (small hive beetle and/or *Tropilaelaps* mites) incursion are included in each zone, which is another requirement of the PSP. In climatic terms this zoning

scheme takes into account the large differences in rainfall between eastern and western UK.

One hundred apiaries are being sampled in each zone so the total number of apiaries involved in the England and Wales is two hundred. Having generated a completely randomised list of apiaries from those registered on BeeBase, we have written to selected beekeepers inviting their participation. The first one hundred acceptances from each zone now comprise our sample population. Regarding the number of apiaries in other MS PSPs, these vary between 145 (Portugal) and 396 (France). The total number of apiaries involved across all MS is just 3,571 so if you are one of the UK participants you are in very select company. Our PSP is based on an assumption of pest/pathogen detection of 5% prevalence. This means that we will inspect sufficient hives to detect a pest/disease even if it is only present in 5% of colonies. Since the majority of apiaries in England and Wales comprise nineteen or fewer colonies, in most cases all colonies in an apiary will be sampled (Figure 2). In England and Wales the average number of colonies/apiary is five hives, thus the total sample population equates to about one thousand colonies.

During the PSP, NBU Inspectors will visit each selected apiary three times over a period of ten months, collecting a continuum of information about colony health. The timing of each visit in the PSP will take into account the seasonality of the beekeeping year in the country in question.

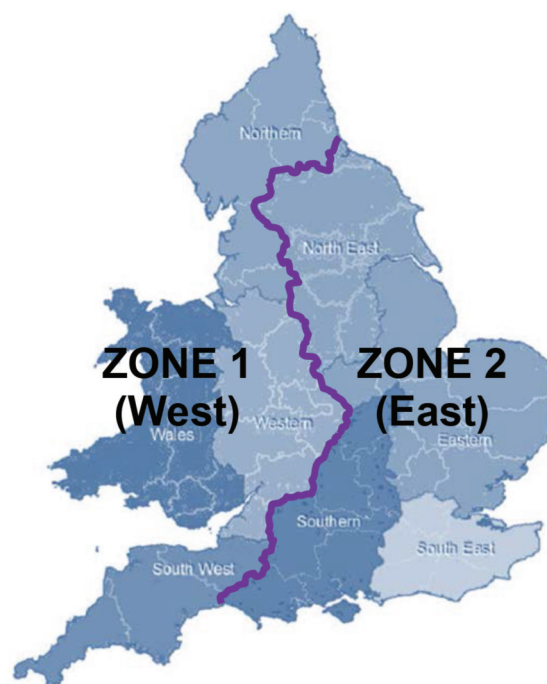


Figure 1. Division of England and Wales into two geographical sampling zones (West and East) for the EURL Pilot Surveillance Programme.

The schedule for the UK is:

- ❑ Visit one must take place at the end of the 2012 beekeeping season, before the bees overwinter. In the UK these first visits have already taken place between August and September. In other MS they may have been scheduled earlier or later in the calendar.
- ❑ Visit two takes place at the end of the over-wintering period, which in the UK is March–April 2013.
- ❑ Visit three takes place during the productive beekeeping season, so in July 2013 in the UK.

All apiaries are being monitored for a given list of pests and diseases. Colony sampling procedures and laboratory diagnostics follow standard protocols developed by the EURL, so data from different MS will be directly comparable for use in the EU policy context.

The first apiary visit will be the busiest of the three. First of all the inspector goes through a questionnaire with the beekeeper, recording the apiary's history, its location, e.g. rural farmland, forested, urban, and the type(s) of hive products harvested (honey, pollen, queens etc.). The beekeeper is also asked to describe any colony diseases, disorders or losses observed during the beekeeping season of 2012. Once the questionnaire is completed, colony inspections begin and up to four types of sample may be



*Figure 2. Top right and above, typically all colonies in an apiary will need to be sampled for the PSP. All photos courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; images supplied by the National Bee Unit at Fera.*

taken. The sample types are:

- (a) 300 adult honey bees will be collected from each colony in the apiary, irrespective of whether the colony shows any signs of disease;
- (b) If, upon inspection, any colony does show signs of disease, a smaller sample of 20–30 symptomatic adult bees will also be collected, but only from affected hives;
- (c) If symptoms of disease are seen in the brood, symptomatic bee larvae may be harvested from affected hives; EFB or AFB will be confirmed in the field using lateral flow device (LFD; based on detecting EFB or AFB using specific antibodies) test kits;
- (d) Any unusual beetles or mites observed inside the colony will be sampled individually.

The second and third visits in spring and summer 2013 should be comparatively less intense. The inspector will note any lost or ailing colonies and will record obvious symptoms of disease. Although all colonies will be opened and inspected, only sample types (b), (c) or (d) are required.

Adult bee samples from the first visit are now being screened for varroa (absence/presence and level of infestation), *Nosema* and viruses. Diseased brood samples not diagnosed in the field are undergoing confirmatory laboratory testing. Additional screening of unusual beetles or mites is carried out if the small hive beetle or *Tropilaelaps* are suspected.



The PSP will run until the end of September 2013. Once analyses are complete, which is anticipated to be December 2013, diagnostic results relating to each apiary will be available to participating beekeepers on the BeeBase database via their personal secure logins. Throughout the project, data will be entered onto the EURL's own secure online-database. The EURL will collate information from all MS to calculate a variety of 'epidemiological indicators' (measures of losses), including: rate of over-winter losses/MS; rate of within season losses/MS; incidence rates for the following pests and pathogens/MS: varroa, deformed wing virus, acute bee paralysis virus, *Nosema*, chronic paralysis, EFB and AFB.

The EC envisages that the PSP will continue on an annual basis and evolve as time goes by. The NBU is fully committed to the delivery of the UK contribution, and the realisation of the EC's aims. We welcome the opportunities the PSP afford us to enhance existing partnerships with our EU colleagues and to forge new ones.

**Gay Marris and Mike Brown,**  
National Bee Unit (NBU)

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