

Winter reflections from the NBU

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An opportunity to find out more about the work of the National Bee Unit and the services it offers

It is at this time of the year that members of the National Bee Unit have a little time to reflect upon the last year, as we prepare for the work of the forthcoming season.

We are all conscious that as 'Service Providers' to the beekeeping industry we need to learn from the beekeepers we visit (our clientele), whilst maintaining and improving our level of service, within an environment of budgetary constraint.

Most beekeepers' perception of the National Bee Unit (NBU) is that a Bee Inspector visits every once in a while to inspect their bees. Hopefully all is well and that is the end of the story until the next visit. Some beekeepers may also attend the various training events which are run by Beekeeping Associations and groups with NBU Bee Inspectors, or attend one of the courses on disease recognition and good husbandry run at the NBU Headquarters at the Central Science Laboratory (CSL) at Sand Hutton near York.

Throughout the working season we are asked questions by beekeepers on all manner of topics relating to apiculture. Invariably, they are answered by means of an individual-to-individual response. However, the likelihood is that if one beekeeper is asking these questions - then many others will be thinking the same.

So, the thrust of this article is to answer some of the main questions asked last season within my own region (East Anglia) and disseminate the answers to as many beekeepers as possible.

It has also been said by many beekeepers that the NBU doesn't 'blow its own trumpet enough', so here goes -



Photos supplied by the National Bee Unit

The CSL buildings in Sand Hutton, York

take a deep breath. Hopefully this narrative will dispel some of that criticism.

BACKGROUND

It is useful, I think, to begin with the rationale for the Government's funding of the bee health programmes in England and Wales which are delivered by the NBU. Bees make an important contribution to farming and the environment through pollination; they also produce honey and wax.

The honey bee (*Apis mellifera*) plays a dominant role, being the major pollinator available for field and outdoor fruit crops. Recent estimates for the value of agricultural and horticultural crops grown commercially in the UK that benefit from bee pollination are in the region of £120-200 million per annum, while the value of honey production annually in the UK fluctuates between £15 million and £30 million. Honey bees

also play an important role in respect of many wild species of flora, contributing to the pollination of many plants of significant ecological value, including major plants of woodland, heath and meadow.

The bee health programme

The primary role of the bee health programme is to control the spread of notifiable diseases of honey bees and to identify and manage the risks associated with new pests and diseases which may be introduced into the UK. This contributes to maintaining the sustainability of beekeeping and the farming industry, particularly for a healthy horticulture industry and rural economy.

The Defra (Department of Environment, Food and Rural Affairs) enforcement policy statement for the NBU reflects this role and states that 'The Central Science Laboratory's aim is: to be a

centre of excellence for the science underpinning sustainable agriculture, safe food and to be a contractor of choice for a broad use community'. The CSL's key enforcement objectives for the NBU are: to maintain effective control of endemic statutory pests and diseases of honey bees and to minimise the risk of introduction of potentially serious exotic pests and diseases through importation, and to protect consumers by minimising the risks of residues in harvested honey entering the food chain through the use of unauthorised treatments (<http://www.defra.gov.uk/corporate/enforcement/index/htm>).

Move to Plant Health Group

The National Bee Unit is due to move into Plant Health Group at CSL from 1 April 2006, to reflect the move of responsibility of Defra's Bee Health Policy from Horticulture and Potatoes Division in London to Plant Health Division in York (<http://www.defra.gov.uk/planth/ph.htm>).

EFFECTIVE AND EFFICIENT SERVICE

Behind the scenes, both at the NBU headquarters at Sand Hutton and within the eight NBU regions, a tremendous amount of work goes on to make sure that we are able to provide the beekeeping industry with an effective and efficient service by:

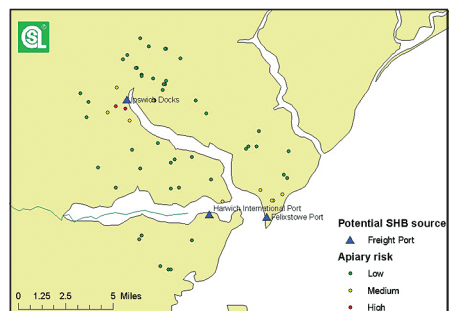
* **Provision** - We try to ensure that all of our key stakeholders are aware of the full range of services available to them. This includes the provision of a targeted statutory disease inspection programme under domestic bee health legislation on behalf of Defra and the Welsh Assembly Government's Department for Environment Planning and the Countryside. This comprises around 5000-6000 apiary visits per year, inspecting 24,000-29,000 bee colonies equating to approximately 10% of the colonies in England and Wales.

* **Performance** - We use 'performance-based' approaches to management of the programme, target setting and monitoring,

budgetary control and accountability. Results are reported to beekeepers via the CSL Bee Health Advisory Panel, through the Good Enforcement Concordat principles under Better Regulation Initiatives and direct to our policy customers. We also conduct annual customer satisfaction surveys with the NBU's major customers.

* **Problem Solving** - We use effective problem solving to manage risks, plan our resources and work allocation to include the dissemination of 'good practice' information to all beekeepers.

* **Sustainability for the Industry** - We are working hard on Strategic and Contingency Planning for the future sustainability of the beekeeping industry, through minimising the risk of importation of exotic pests and diseases and managing risks should serious exotic organisms be discovered.



Identifying 'at risk' apiaries

CONTINGENCY PLANNING AND SURVEILLANCE

Bee Inspectors incorporate pest surveillance inspections at identified 'risk apiaries' for the Small Hive Beetle (*Aethina tumida*) and also *Tropilaelaps* spp into Statutory Disease Inspections. 'At risk' apiaries have been identified across England and Wales, such as those close to importers of raw beeswax, container freight depots, airports, ports and wholesale fruit markets. These 'at risk' apiaries are then plotted onto surveillance maps using Graphical Information Systems and, from this, are graded to ascertain their perceived level of risk from potential exotic threats to

Question

What else does the National Bee Unit do in addition to inspecting bee colonies for statutory diseases?

Answer

In addition to the Statutory Bee Inspection Service, the National Bee Unit carries out a number of other major areas of work. It is an integrated unit comprising laboratory diagnostics, research, statutory inspections, training and extension.

apiculture. In the coming years, the emphasis of this statutory work is likely to shift more towards surveillance for exotic threats.

Together with Defra and the Welsh Assembly Government, the NBU has developed a contingency plan which prepares for the potential invasion of exotic pests and diseases. This will cover the emergency actions required to either attempt to eradicate an exotic threat to apiculture or contain it within a restricted area. The plan is shortly to go out to consultation.

ADVICE AND CONSULTANCY

The work of the NBU covers many issues, not just bee health and husbandry. Advice is provided to Government Departments, small-scale beekeepers and bee farmers on bee-related topics such as European Union Directives, formal health risk assessments for bee imports, contingency planning, effects of pesticides on bees and other beneficial insects, and also on the registration of bee-related veterinary medicine products.

The NBU has provided overseas consultancy to a number of countries including Israel, Malta, New Zealand, South Africa and China. It is a member of the European Integrated Varroa Control Group and the European Association for Bee Research (EurBee) and has good contacts internationally upon which it continues to build collaborative links.

NBU staff have given lectures at the Apimondia Congresses held in Slovenia and Ireland and at conferences



NBU staff also provide overseas consultancy

organised by the EU-funded Bee Research and Virology in Europe (BRAVE) and Office International des Epizooties (OIE) (the World Animal Health Organisation) (http://www.oie.int/eng/en_index.htm).

The Head of the Unit is also member of an expert advisory group that advises the EU Commission on matters relating to apiculture, including regulatory affairs.

The NBU also offers apicultural training and experience to workers from abroad, training them in beekeeping technologies, disease control measures and bee pathology. This contributes to the Unit's tradition of strong liaison and collaborative working with overseas researchers in bee-related subjects.

PEST AND DISEASE DIAGNOSIS **Development of novel detection methods for pests and diseases including the small hive beetle (*Aethina tumida*)**

As part of the implementation of the national bee health programme for England and Wales, the NBU is currently developing a suite of novel molecular tests to improve the detection and diagnosis of bee pests and diseases. These tests could be used for large-scale survey work as well as for general diagnosis and as a research tool. Testing is based on a technique called real-time PCR (TaqMan®), which is a highly sensitive, fast and accurate method of detecting the DNA or RNA of organisms. The NBU aims to develop tests for most of the different pests and diseases of

honey bees, a 'one stop shop' approach. These include bee viruses, foul brood diseases, pathogenic fungi, tracheal and varroa mites and Nosema species.

In addition, tests are being developed for the detection of exotic pests, such as tropical mites (beginning with *Tropilaelaps clareae* and *koenigerum*) and the small hive beetle (*Aethina tumida*). The TaqMan® technology can be used to screen individual bees but it can also be used to screen up to 1500 samples per week for the range of pests and diseases mentioned. As well as screening bees, methods are also being developed to screen hive debris. Again, it is anticipated that a large number of hive debris samples could be screened rapidly in the event of an incursion of an exotic pest, such as the small hive beetle or *Tropilaelaps* mites, both already notifiable in the European Union for the purposes of international trade and

shortly through impending legislation: *The Bee Diseases and Pests Control (England) Order 2006* (SI 2006 342) and similar legislation to be implemented in Wales, Scotland and Northern Ireland. The value of this technology was also demonstrated in 2004 during a survey for Kashmir bee virus (KBV) in England and Wales. In this survey, 458 hives were screened and KBV was found at two sites. Until this survey, it was thought that KBV was exotic to the UK. However, it seems likely that the virus has been present for some time but remained undetected.

Over the next two years, the NBU wishes to put this tool to wider use, such as carrying out further surveys using the TaqMan® assays to determine the health status of bee colonies at a national level.

Detection methods for foul brood-causing bacteria



The lateral flow device for field diagnosis of AFB

The aim in developing the foul brood test kits, known as lateral flow devices (LFDs), was to produce quick and simple field test kits for American Foul Brood (AFB) and European Foul Brood (EFB), for use by both bee inspectors and beekeepers. The kits are the result of a collaborative project between the Central Science Laboratory and Vita (Europe) Ltd and are based on existing generic technology, originally developed by CSL for plant pathogens and other antigens for use by the Defra Plant Health and Seeds Inspectorate (PHSI). The foul brood kits use monoclonal antibodies of either *Paenibacillus larvae* subsp. *larvae* (AFB) or *Melissococcus plutonius* (EFB), the organisms which cause the respective foul broods. The AFB kits were validated in 2004 and are now used as the routine

Question

Does the NBU work closely with other Government Departments, both National and Local upon matters of joint concern?

Answer

In addition to its advisory work for Government, the NBU also has a good working relationship with other agencies, both governmental and within private industry. Particular examples of this are recent liaison with the Associated British Ports Authority and private freight port owners as part of the preparation of the contingency plan for exotic pests and diseases, and also informal consultation and advisory work with honey packers and wax processors. It has to be remembered that, although there may be a 'tentative' link to many other areas, personnel of the NBU do not have any statutory rights, where statutory responsibility lies with other agencies or organisations, although on many occasions the NBU is contacted to offer advice on bee-related issues by local authority trading standards and environmental health departments.

Question

What happens if a beekeeper refuses to allow access to the bee inspector to inspect his or her colonies?

Answer

The most important thing to point out is that this is a very rare occurrence indeed. Most beekeepers know their local bee inspector and see him/her as a useful tool in their overall apiary management - not just from the point of disease and exotic pest inspections, but also for 'good practice' advice such as apiary management and safe varroa controls. On the whole, the NBU and its field staff have a tremendous rapport with beekeepers and bee farmers and are mindful of the two-way support mechanism, that exists.

The Bees Act 1980 makes provision for powers of access for Appointed Bee Inspectors to carry out Statutory Bee Inspections.

On the rare occasions where, for whatever reason, a beekeeper refuses to allow a bee inspector access, a process of diplomatic negotiation will immediately be attempted between the beekeeper and NBU regional management, Should this fail and entry be obstructed by the beekeeper then he/she is deemed to have committed an offence and action may be taken. If other information is required by the Bees Act, eg, the whereabouts of hives, is not supplied then details are passed to Defra or the Welsh Assembly who will examine the facts and, where necessary, instigate legal proceedings.

It has to be remembered that the acts of one beekeeper usually have a knock-on consequence for many others within a small area where disease or potential exotic threats are involved and, in general, beekeepers co-operate for their own benefit and the benefit of fellow beekeepers.

field diagnostic confirmatory method for AFB by the NBU inspectors.

TRAINING AND EXTENSION WORK

In addition to their statutory disease role, one of the major roles of NBU personnel is to provide training and extension services for beekeepers, the aim being that they can become more self-sufficient through improved bee husbandry.

This involves running themed training courses such as the recognition and management of bee diseases and good



An NBU training course

practice for the bee industry. The courses are typically provided by the Bee Health Inspectorate but are also held at the National Bee Unit HQ at CSL York.

Bee Inspectors work closely with beekeeping associations to ensure that the training provided is timely and relevant to the recipients and, where requested, training courses and seminars are tailored to an individual group's needs and requirements. In recent years, we have concentrated upon managing varroa, including resistance management and integrated varroa control using integrated pest management (IPM) methods and raising awareness of exotic pests. In the next few years, we will place greater emphasis on foul brood recognition and control and, in particular, management of EFB.

RESEARCH AND DEVELOPMENT

The NBU conducts an ongoing active programme of research which is designed to support bee health policy and provide the bee industry with the best advice for disease control. Some of

the work has already been highlighted, but it is essential to remember that the Field Team of Bee Inspectors plays a major part in the research work carried out by gathering samples and data and trialling equipment. We also get a tremendous amount of help from individual beekeepers and bee farmers who actively participate in what we do. This can be simply by sending in samples of bees for analysis or by allowing us to use their colonies for experiments.

Emphasis is placed upon research which is directly applicable to the practicalities of beekeeping in the field, working towards the ultimate goal of beekeeper self-reliance.

CONSUMER AND ENVIRONMENTAL PROTECTION

Why sample honey from beekeepers? The NBU is contracted to collect honey samples directly from beekeepers on behalf of the Veterinary Medicines Directorate (VMD) as part of Defra's statutory residue monitoring programme, which is known as the National Surveillance Scheme. Samples are tested for a range of substances including antibiotics, pesticide residues and environmental pollutants. Beekeepers who provide samples are given the results of the test and a full report on all samples is available from the VMD Website: (<http://www.vmd.gov.uk>) following the links to News and Mavis On-line.

Bee Inspectors also collect food samples from supermarkets and other retail outlets on behalf of the Food Standards Agency. This work contributes to the statutory responsibility of each EU Member State to monitor food for residues and ensure the safety of the consumer. The collection of honey samples helps to protect consumers by minimising the risks of residues in harvested honey entering the food chain.

The NBU also carries out work for Defra's Wildlife Incident Investigation Scheme (WIIS) which monitors the effects of pesticides upon wildlife, pets and



Collecting honey samples to minimise the risk of harmful residues entering the food chain

beneficial insects. The scheme sets the International Standard for environmental monitoring of its kind and is highly regarded. (<http://www.pesticides.gov.uk/environment.asp?id=58>)

COMMERCIAL SERVICES

The NBU has full Good Laboratory Practice (GLP) compliance, which is an internationally recognised standard for the production of regulatory data. Toxicity tests on adult worker honey bees are conducted at the NBU in line with international guidelines, where assessment of acute contact and oral toxicity of chemicals to bumblebees is carried out. In recent years, this work has expanded to encompass assessments of the effects of insect growth regulators upon honey bee brood and the NBU is among the most experienced in Europe in directing these studies.

On a larger scale, semi-field tests with honey bees or bumblebees are undertaken in bee-proof polytunnels or in computer-managed glasshouses. The NBU also assists with the development of new medicines, eg, varroacides. It has 150 colonies of bees used for research and training. Additionally, the network of Bee Inspectors with their local knowledge also gives access to a wide range of field sites throughout the UK.

For those beekeepers who do not have access to the website, the NBU, its network of Regional Bee Inspectors and, during the active season, Seasonal Bee Inspectors, are only a telephone call

away. In many cases a telephone call to the NBU Office, where the staff are fully conversant with most aspects and terminologies of the beekeeping world, will either yield the information required or put the individual in touch with the one to whom they need to speak.

BeeBase on line

This year, we are also in the middle of an important project funded by the Defra Challenge Fund to modify and improve the NBU's beekeeper database 'BeeBase on line'. The aim is to web-enable and expand the functionality of the database, which contains all the apicultural information relating to the statutory bee health programme in England and Wales.

The project will produce a centralised web-based information warehouse and management system on all regulatory aspects of apiculture, including bee health, disease incidence and control. It will include research data, general reports and interactive maps of disease incidence/spread for use across all of the Defra Divisions with work impinging on bee health and by beekeeping industry stakeholders.

Information technology specialists within CSL are currently completing the design, functionality and information content of BeeBase. Once completed, bee inspectors and beekeepers alike will

be able to download certain levels of information relating to pest and disease control and other areas of the NBU's bee health work. Up-to-date research findings will also be posted at regular intervals on the website. It is anticipated that the public access section for BeeBase will shortly go 'live'.

Question

What steps is the NBU taking to keep in contact with beekeepers who are not members of beekeeping associations and is lack of compulsory registration a problem?

Answer

The NBU recognises that approximately one half of beekeepers that are registered on its BeeBase (database of beekeepers) are not members of beekeeping associations. These beekeepers are contacted and treated in the same way as any other beekeeper. From the perspective of the NBU, the term 'beekeeper' is all-inclusive and the service provided is the same. The main difficulty arises from actually making initial contact with these beekeepers and information about them generally comes by word of mouth from another beekeeper in the area.

We also realise that there are many beekeepers out there that neither

Question

Is the information on the NBU's website up to date?

Answer

The information on the NBU's website is an important tool for use by any beekeeper or prospective beekeeper. The site contains a wealth of informative material including all of the NBU's Beekeeper Advisory Booklets in PDF Format which can be printed off or downloaded to a personal computer. Varroa information can also be accessed along with the 'Varroa Calculator' to assist in identifying optimum treatment of bee colonies at the correct time. There are also disease location statistics, pyrethroid-resistant varroa updates and, importantly, the names and contact details of everyone within the NBU, so that you can seek advice either from staff in York or your region if you need to.

It is sometimes highlighted that links from page to page on the website occasionally refuse to work and need attention. The site is used and monitored by NBU staff but if we do not identify a problem, we are pleased to be informed by a telephone call or e-mail so that we can keep things running smoothly. It is important that we receive and respond to any and all feedback (both good and bad).



Assisting with field trials in poly-tunnels

beekeeping associations nor we know about.

We encourage any beekeepers reading this who are not members of a beekeeping association and have never been contacted by their local bee inspector to get in touch with us. Our services are free and we cannot hope to inform you of important information in your area, such as disease outbreaks and training events, if we do not know about you. Any information held on our beekeepers' database is confidential, not shared with anyone else and is used in accordance with the Public Service Guarantee on Data Handling (http://www.csl.gov/aboutcsl/documents/data_guarantee.pdf).

We have found that when non-association beekeepers are contacted they are co-operative and are keen to have their bees inspected; they simply choose not to be a member of a beekeeping association or group which is, of course, their prerogative.

Beekeepers who have, for whatever reason, not been contacted for some time are periodically written to with a 'Confidential Beekeeping Survey' asking them their current beekeeping status and visits/inspections are arranged from this information.

The system on the whole works very well and, thus far, has negated the need for an administratively and financially burdensome system of compulsory beekeeper and apiary registration as operated in many other countries where, ultimately, the cost of administering the system is passed onto the beekeeper.

During the summer of 2005, I met with the Head of New Zealand's AgriQuality - Bee Inspection Service. Compulsory registration is in place there, but they still have some beekeepers that do not register and the same difficulties with initial contact also exist. It was interesting that when searches for varroa were instigated, it was found that approximately 15% of beekeepers in New Zealand were not registered with the Apiculture Service.

Question

What has happened to the recommendations from the 2001 ADAS 'Economic Evaluation' of Defra's Bee Health Programme, and how is the overall performance of the NBU measured?

Answer

The performance of the NBU is measured in several ways. In July 2001, ADAS Consulting Ltd carried out its

Economic Evaluation of Defra's Bee Health Programme. This was a lengthy consultative evaluation of the programme, which was published as a report which can be freely viewed at <http://statistics.defra.gov.uk/esg/evaluation/beehealth/default.asp>

The evaluation team noted 'that the organisation of the inspection service with home-based staff and seasonal inspectors is a relatively low-cost operation in comparison with other inspectorates and that the resources of the Bee Health Programme are efficiently managed and appropriately deployed'.

The evaluation report made 11 recommendations which covered bee health legislation, documentation, contact with beekeepers and beekeepers on BeeBase, importations, research, strategy and funding. Of those 11 recommendations, seven required direct action from the NBU with the other four being direct policy decisions which are made outside of the NBU.

The seven recommendations, which have been addressed by the NBU, centre on:

Updating and harmonisation of EU bee imports legislation

This has been addressed by Defra and the NBU, firstly by working with the European Commission to strengthen biosecurity controls to reduce the risk of introduction of novel pests and diseases through imports into the community and, secondly, through the updating of domestic bee health legislation in England through the new *Bee Diseases and Pests Control (England) Order 2006*.

More comprehensive information on the Bee Health Programme is now contained within the Bee Health Reports, NBU business plan and objectives for the period 2003 to 2007, the NBU website and new or updated beekeeper information booklets.

Registering and contacting beekeepers

This has been achieved through BeeBase audits and individual contact with

greater numbers of beekeepers. This will be greatly enhanced when 'BeeBase Online' is fully operational. This year alone, the NBU has written to well over 3500 beekeepers with Confidential Survey Letters.

Strategy Document for Training and Extension Activities

A document has been produced covering proposed training activities as part of the Bee Health Advisors Scheme and, although not accepted for that purpose at this time, it nevertheless provides a useful foundation for future training and extension activities.

The NBU's performance is also monitored in several other ways.

As part of CSL, the NBU is subject to the overarching Quality Systems of the organisation. These are overseen by CSL's Quality Systems Team who are responsible for making sure that both internal and external quality systems are maintained and expanded to suit the business needs of CSL. Practices and

procedures are revised and reviewed as an ongoing process of continuous improvement.

The quality standards in place at CSL are assessed by organisations completely external to CSL, although CSL's Quality Systems Team also carry out quality audits, for example, observing the work of Bee Inspectors and other NBU staff and auditing their actions and responses in line with agreed benchmarks called 'Standard Operating Procedures'.

The work of all Bee Inspectors is assessed as part of CSL's Performance Management system and they have 'Targeted Performances', eg, how many apiary visits, colony inspections, beekeepers' training and extension activities they undertake, which all form part of their overall performance.

Individual beekeepers can also be contacted at random through surveys and asked about their satisfaction with the Bee Inspector's performance at their apiary or event and if they have any other observations or comments to make.

We then try to learn from that feedback and improve the service we provide. Customer satisfaction surveys are conducted with major customers of the NBU, within Defra and the WAG, and beekeeping associations.

The NBU also receives many letters of comment each year - mostly good, occasionally bad and, as previously mentioned, the NBU welcomes all feedback and comment.

BEE HEALTH ADVISORY PANEL

Last but by no means least, another 'independent' way in which the NBU's performance is monitored and discussed is through the work of the Bee Health Advisory Panel (BHAP). This was set up in 1999 and its main remit is to look at the performance of the NBU against publicly agreed benchmarks for its work under the Government's bee health programme in England and Wales.

The BHAP is chaired by the head of the NBU (Mike Brown). It consists of three independent members with strong apicultural backgrounds and five representatives of national apicultural organisations across England and Wales, both small-scale and commercial, so they are able to look at the NBU objectively as users of its services. The Panel meets annually with other business being conducted by telephone and e-mail. It helps to develop a rapport between CSL and other stakeholder organisations with the aim of agreeing and improving working practices and co-operation towards better statutory control of bee diseases. Notes of the BHAP meetings and other associated documents are available on the NBU website: <http://www.csl.gov.uk/science/organ/environ/bee/adpanel/bhap.cfm>

Hopefully this narrative will have given all readers of *Bee Craft* a deeper insight into the broad range of work and responsibilities of the NBU and, importantly, further enhanced their own knowledge and the knowledge of the NBU through a two-way flow of information.

It is important that all beekeepers know that the integrated NBU is much more than 'just an inspection service'. □



BeeBase will provide access to a wide range of data