



People Science & Policy



A Study of Beekeeping Practices: Influences and Information Sources

Final Report Prepared for Defra

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11 May 2010

PSP/09/038

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Executive Summary

Background

The Department for Environment, Food and Rural Affairs (Defra) commissioned People Science & Policy Ltd (PSP) and East Malling Research (EMR) to undertake a study to enable the department to better understand beekeepers' husbandry practices and approaches to managing pests and diseases. The focus of the study was to build an understanding of how beekeepers access and respond to advice and information about beekeeping husbandry. This will help Defra and the Welsh Assembly in consultation with stakeholders to deliver the Healthy Bees Plan¹, which sets out ways to sustain:

"the health of honey bees and beekeeping in England and Wales over the next decade".
Healthy Bees

Methodology

The study comprised the following elements:

- a scoping stage to prepare the team;
- 20 semi-structured qualitative telephone interviews with bee farmers;
- 30 semi-structured qualitative telephone interviews with amateur beekeepers who had two or more years' experience;
- an internet survey of 906 beekeepers and 31 bee farmers; and
- 20 in-depth follow-up interviews conducted by telephone with respondents to the internet survey who had been keeping bees for fewer than two years.

Profile of Beekeepers

There is no robust data about the national population of beekeepers with which the survey respondents can be compared. Thus, even though we have a large number of respondents, they cannot be said to be representative of any wider beekeeping community. Nevertheless, the findings are indicative of the community's views and experiences.

Responses to the internet survey

- 47% of respondents had been keeping bees for less than two years.
- There were at least 50 respondents from each of the seven NBU English regions, 11% of respondents were living in Wales.
- 68% of the respondents were male, and 32% were female.
- The overall age profile of respondents indicates a relatively mature population.

Reasons for beekeeping

General interest was the key motivation for people taking up beekeeping, although harvesting honey for personal use, environmental benefits and concern about declining bee numbers were all important motivators. Beekeepers with less than two years' experience were twice as likely to be motivated by environmental factors as those with two or more years' experience.

Attitudes to beekeeping practices

An analysis of attitude statements within the survey revealed the following points.

Modern husbandry methods

- Whilst a majority of beekeepers endorsed the need for modern beekeeping methods, this belief is more prevalent among those with more experience and a larger number of colonies.
- Nearly half of respondents aspired to chemical free beekeeping, this is particularly true for beekeepers with less than two years' experience.

¹ "Healthy Bees: Protecting and improving the health of honey bees in England and Wales"



Vigilance

- A large majority of beekeepers accept the need for vigilance and keeping up-to-date with the latest husbandry advice.

Information preferences

- Information preferences tended to reflect beekeepers' level of experience. Newer beekeepers were more likely to express a preference for obtaining information from other beekeepers, while more experienced beekeepers, who are likely to have a greater degree of confidence in their practical skills, were more likely to prefer written sources of information.

Practices

Almost everyone who took part in the survey said that they regularly monitored their bees for pests and diseases (97%). Virtually all survey respondents (96%) said that they controlled for varroa mite. The few who did not cited low levels of infestation and allowing bees to build up their own immunity as explanations. By far the most common control for varroa was Apiguard, with the use of open mesh floor and oxalic acid also popular. Those who had six or more colonies used the largest combination of varroa controls (4.7 controls on average), whilst those who had one or two colonies used 2.7 controls on average.

Integrated Pest Management

About a third (35%) of respondents used Integrated Pest Management (IPM) to control for varroa. Indicators of being well integrated into the beekeeping world, such as awareness of BeeBase and a wide range of contacts among other beekeepers were the most important factors associated with use of IPM.

Choosing husbandry methods

The follow-up interviews revealed that newer beekeepers often considered recommendations from other beekeepers alongside their own judgement based on the information they had available, to decide which monitoring methods and treatments to use. These interviews also revealed that such advice was often thought to be conflicting, which made it hard to determine best practice.

History and awareness of pests and diseases

A majority of respondents (86%) said that their bees had experienced varroa, while 44% had experienced chalkbrood and 22% Nosema. Additionally, 6% had experienced acarine, 6% sacbrood, 5% European foulbrood (EFB) and 2% American foulbrood (AFB). The telephone interviews confirmed that varroa was often diagnosed by beekeepers themselves, but inspectors were called in where notifiable pests and diseases, particularly AFB and EFB, were suspected. One in five (21%) respondents to the internet survey reported that they had lost all or most of their colonies in one season.

How has beekeeping changed?

Beekeepers with more than two years' experience reported that beekeeping had become more labour intensive, it was no longer possible to be a "*leave alone beekeeper*" because of the increase in pests and diseases, in particular varroa. This group was also pessimistic about the future with respect to the prevalence of pests and diseases.

Knowledge of regulation

Almost all the respondents (97%) were aware that by law some diseases and pests must be reported to the bee inspectorate. The telephone interviews with more experienced beekeepers found that these beekeepers were much more likely to identify AFB and EFB as notifiable pests and diseases than small hive beetle or Tropilaelaps mites.

Very few of the beekeepers we interviewed over the telephone were aware of the legal requirement to keep a list of treatments applied to the hive. However, they were aware of regulations relating to food labelling and sales.



Influences

Beekeeping associations

The overwhelming majority (98%) of the survey respondents were members of a beekeeping association.

The semi-structured telephone interviews with more experienced beekeepers revealed that on the whole membership of an association was “*invaluable*”, mainly because of access to informal networks. Follow-up interviews with beekeepers with less experience revealed the supportive nature of the local associations and many newer beekeepers described them as the most important source of information.

Training before obtaining bees

Two thirds (66%) of those who answered had some sort of training before they owned their own hives, with those who had kept bees for the longest the least likely to have had training before owning their own hives.

Of those who had received training before owning hives, the two principal providers were local beekeeping associations (72%) and other beekeepers (30%). Some follow-up interviewees with less experience reported difficulty accessing training courses because of high demand.

Virtually all of those who had training before they owned their own hives (99%) found it ‘beneficial’ and the great majority (90%) found it ‘very beneficial’. A few who had no, or limited, training before owning their hives admitted that on reflection having more knowledge before they started would have been helpful.

Courses/talks since obtaining bees

The respondents to the internet survey regarded it as very important to keep up-to-date with bee husbandry advice. The telephone interviews found that some of the more experienced beekeepers felt that they would not learn anything new from attending courses. Others were keen to learn as much as possible and go to as many talks as possible.

The internet survey found that local beekeeping associations, NBU inspectors and other beekeepers were all important providers of on-going training. The most popular courses/talks were those on general husbandry techniques, with the great majority of the respondents (91%) attending this sort of event.

As would be expected, more experienced beekeepers were more likely to have attended talks on a range of more specialised subjects. However, a majority of respondents who had fewer than two years’ experience had attended courses on a range of subjects (for example control of pests and diseases and preventing colony loss). Overwhelmingly, the respondents reported that the courses and talks were beneficial, although the skill of the trainers was variable.

Future training needs

Almost all (94%) of the respondents reported that they would like to attend training, talks or courses in the future, with control of pests and diseases, general husbandry techniques, diagnosis of pest and disease problems and preventing colony loss all cited as topics that would be of interest.

Sources of information

Over half of the respondents to the internet survey (57%) obtained information from a beekeeping association **before** getting bees, 43% used written materials such as books and journals, while a third (33%) got information from a friend or acquaintance and a quarter (24%) had used the internet.

With regards to current sources of information, no respondents to the internet survey answered ‘Nowhere/do not need information or advice’ to the question ‘Where do you look for information or advice about beekeeping?’ Many of the respondents used multiple sources of information and 81% reported using four or more of the sources listed.



Magazines and newsletters

Over three quarters (78%) of the beekeepers who responded to the internet survey sought general information and advice about beekeeping from 'Magazines/newsletters', with BBKA News (82%), local newsletters (74%) and BeeCraft (64%) the dominant publications.

Websites

Over three quarters (78%) of the beekeepers who responded to the internet survey sought information and advice from websites, with a search engine, the BBKA website, local beekeeping associations, BeeBase and the Defra website the most commonly cited.

Pests and diseases and colony loss

Respondents to the internet survey reported that they were most likely go to contacts at a beekeeping association, leaflets from organisations such as the NBU and websites for information about treatments for pests and diseases and separately colony loss. Newer beekeepers were more reliant on local contacts, while those who had been keeping bees for longer placed greater emphasis on leaflets from organisations such as the NBU.

The NBU

Awareness of the NBU is very high, in the internet survey only 8% of respondents said that they had not heard of the NBU.

Awareness of and registration on BeeBase

BeeBase has an important role to play in the beekeeping community both as a source of information and as a database for the bee inspectorate from which beekeepers can access their records. It is therefore surprising that nearly one in four (23%) respondents to the internet survey were not aware of BeeBase. The factors associated with high awareness of BeeBase were:

- the number of other beekeepers known; and
- beekeepers' preferences for written sources of information.

The main reason given for registering on BeeBase was to gain 'access to information and advice', while the most frequent reasons given for not registering were that the beekeeper had not yet 'got round to it' or did 'not see the benefit'.

Some beekeepers were unsure of whether their association or the local bee inspector had registered them on BeeBase. It was also reported that there was no benefit to registering on BeeBase.

NBU as a source of information

Just under half (47%) of the internet survey respondents had sought information or advice from the NBU. Beekeepers with longer experience of beekeeping were not only more likely to have heard of the NBU than those who had taken up the craft more recently, they were also more likely to have sought information from the NBU.

The great majority (97%) of the beekeepers who had contacted the NBU had obtained the information or advice they wanted at least 'to a certain extent', with just over half (52%) indicating that they had obtained **all** the information they wanted. The follow-up interviews with less experienced beekeepers confirmed that the NBU was generally seen as useful, but many commented that it was just one of a number of sources used.

What beekeepers want of the NBU

Many of the more experienced interviewees could not think of anything extra that the NBU could offer. Others expressed a variety of views, including sponsorship of research into pests and diseases and greater provision of, or support for, training and training materials. The importance of the NBU's communication role was emphasised, in particular the need for more active dissemination and advice. Some also suggested compulsory registration of beekeepers, although others were against this.



The bee inspectorate

Just over half of the respondents (55%) had been visited by a bee inspector. Almost all reported that the visit was helpful, with the “reassuring” aspect of visits being highlighted by follow-up interviews with less experienced beekeepers. However, a number of these newer beekeepers were not actively planning to seek a visit from a bee inspector.

Information needs

Interviewees highlighted a need for information for ‘potential’ beekeepers, as well as clearer guidance on the level of knowledge needed to use different publications. It was also suggested that beekeepers would be very interested in learning more about the scientific research being conducted in the UK and any possible implications for husbandry practices.

Bee farmers

Most of the 31 bee farmers in the survey had been keeping bees for 20 years or more and between them had over 2082 colonies. Some respondents gave a range instead of an exact number, in which case the minimum number was used to calculate this total. This total also excludes one bee farmer who refused to answer the question.

Husbandry practices

All the bee farmers regularly monitored their bees for pests and diseases and controlled for varroa. Importantly, bee farmers with more than 20 hives tended to treat all the hives if they saw pests and diseases in just one because they believed that any pests and diseases would spread.

Bee farmers who took part in semi-structured telephone interviews felt that beekeeping had got harder, mainly because of the increase in disease and the need for a more scientific approach. Some bee farmers felt that a new breed of better educated amateur was coming in to the craft and that this might serve to raise the level of practice. These bee farmers were very concerned about some older beekeepers who, in their opinion, had not yet adopted modern practices.

Bee farmers were split between those who felt that pests and diseases were now under control and those who feared that the situation would get worse in the future.

All 31 bee farmers who responded to the internet survey said that they were aware that some pests and diseases had to be reported to the bee inspectorate. All of the 20 interviewed by telephone stated that AFB was notifiable and all but one stated that EFB should be notified. Other legal requirements mentioned related to insurance and to food standards for honey. Some also mentioned logging products applied to the hives.

Information sources

Only one bee farmer from the internet survey was not a member of some kind of association. Meeting other beekeepers and the provision of information were given as the main reasons for joining associations.

The majority of bee farmers in both the internet survey and telephone questionnaire indicated that they were interested in attending more courses. There was particular interest in knowing more about research into pests and diseases and the husbandry implications of the findings. The bee farmers were keen to know about developments outside the UK and the implications for the UK, either in respect of pests and diseases coming into the UK, treatments or the development of husbandry methods.

The NBU

All of the bee farmers were aware that the bee inspectorate is part of the NBU, and nearly two thirds had registered themselves on BeeBase. Bee farmers mainly registered so that they could gain access to information or to be able to track their inspection history. A few of the telephone respondents were concerned that registering the location of their hives would lead to hives being stolen. However, several were in favour of registration being compulsory.



Most bee farmers had been visited by a bee inspector in the 12 months prior to the internet survey. Most who completed the internet survey indicated that they found the bee inspectors' visits helpful. However, the telephone interviews revealed that some thought that the inspector who visited did not have enough experience. Some of the telephone respondents expressed concern about the independence of some bee inspectors and felt that they should not, for example, be members of local associations. Some also regretted that the system of county inspectors, which they felt helped to maintain standards and provided training for beekeepers in general, had been discontinued. The bee farmers reported that they would like feedback after any tests on their bees or colonies have been completed.

Some of these bee farmers stressed that bee farming is a commercial undertaking and is part of the farming sector but they feel that they are treated differently from those farming other livestock.

Conclusions and Recommendations

Our conclusions relate to each of the objectives of this study.

How do beekeepers decide which husbandry methods to employ, and what are their experiences of, and attitudes to, those methods?

Nearly all of the beekeepers who took part in this study were conscious of the benefits of keeping up-to-date with the latest husbandry advice. This openness to new ideas is striking and is driven by a widespread awareness of the threat from the varroa mite in particular and other pests and diseases in general. Those who had more recently taken-up beekeeping looked to more experienced beekeepers for advice about which husbandry methods to use. More experienced beekeepers were more likely to express a preference for using written sources of information such as journals, newsletters and websites for advice about issues such as dealing with pests and diseases.

How are beekeepers' behaviours and practices influenced by the advice available to them?

The beekeepers who responded to the internet survey were hungry for information and drew on a wide range of sources. Most beekeepers were keen to keep their knowledge up-to-date, and had attended courses, talks and training events since owning colonies.

One of the main factors that influenced behaviour was the degree of integration into the beekeeping world as measured by:

- the number of contacts with other beekeepers;
- knowledge of BeeBase; and
- the use of written information.

The other important factor that influenced behaviour was the level of experience of the beekeeper both in the length of time they had kept bees and the number of colonies that they managed.

Those who were more experienced and integrated into the beekeeping world tended to use a wider variety of control and monitoring methods, including more complex bio-technical control methods. They were also more likely to use IPM. This seemed to be due to a higher level of technical ability and greater confidence in applying information from a variety of sources.

What are the drivers for, and barriers to, new beekeepers adopting good husbandry methods?

The beekeeping community in England and Wales has increased substantially over recent years as a new cohort of people have been attracted to the craft, possibly spurred on by media publicity about the declining bee population. Awareness of varroa and other threats is the main driver for new beekeepers to adopt good husbandry methods.

The new cohort of beekeepers recognises the need for training. However, difficulty getting a place on courses is a barrier to new beekeepers adopting good husbandry methods.



BeeBase has an important role to play in the beekeeping community both as a source of information and as a database for the bee inspectorate from which beekeepers can access their records. Given this important role and that most of the respondents were members of local associations, it is surprising that many beekeepers (especially those with less experience) were unaware of BeeBase. Being unaware of and unregistered on BeeBase may be a barrier to beekeepers receiving information about, and therefore adopting, good husbandry methods.

The beekeepers we interviewed did not have a strong sense that there was such a thing as 'good practice' in beekeeping. This poses a barrier to beekeepers' understanding of which husbandry methods they should adopt.

What are the most effective ways of influencing beekeepers to adopt better husbandry of their bees?

Taking into account the conclusions presented in the preceding sections, we recommend that Defra promotes four key courses of action to influence beekeepers in their choice of husbandry practices.

Tailor the message

Defra should promote the dissemination of information about good husbandry practice. To do this effectively, it should recognise that the message needs to be tailored to different types of beekeeper.

Newer beekeepers are less likely to be comfortable using written information without support from a more experienced beekeeper, especially if it contains a high level of scientific and technical detail. More experienced and integrated beekeepers often welcome information with a high level of scientific and technical detail, and are influential in training and mentoring newer beekeepers. Defra should therefore disseminate good husbandry practice by producing information that meets the different needs of these two audiences.

Clarify what constitutes 'good practice'

Some beekeepers expressed confusion over what might constitute 'good husbandry practice'. Defra should promote headline messages about good practice, such as the use of IPM to control varroa.

Support introductory training

The large size of the cohort of new beekeepers and their substantial demand for introductory training has led to a shortfall in the supply of training places. Some experienced beekeepers expressed a concern that the quality of training may suffer if inexperienced trainers attempt to meet this demand. Defra should support introductory training by making good quality training materials publicly available. Other potential measures may include encouraging seasonal bee inspectors to provide training courses 'out of season'.

Promote registration on BeeBase

BeeBase should be a valuable tool for disseminating information. Our study has found that Defra needs to improve both:

- BeeBase's profile among the beekeeping community; and
- use of BeeBase amongst the beekeeping community.

A surprisingly large number of beekeepers were not aware of BeeBase, even though many were members of local associations and have attended talks and training. This suggests that beekeepers do not talk to one another about BeeBase. BeeBase should take advantage of the demand for information among beekeepers by actively promoting itself as a useful information resource for the beekeeping community. This will encourage registration by giving those who are aware of BeeBase a reason to register, and a reason to talk about it to those who may not know of it, thus increasing awareness through 'word of mouth'. Defra could promote awareness of BeeBase through measures such as search engine optimisation and Google 'AdWords'.



1 Introduction

1.1 Background

The Department for Environment, Food and Rural Affairs (Defra) commissioned People Science & Policy Ltd (PSP) and East Malling Research (EMR) to undertake a study of beekeeping practices in England and Wales in November 2009.

An upsurge in beekeeping at an amateur level during 2009 led the British Beekeepers Association (BBKA) to report a 25% increase in membership. There is a wealth of information available to beekeepers at both a national and local level from Government departments and associations such as the BBKA and the Welsh Beekeepers Association (WBKA). The focus of the study was to build an understanding of how beekeepers access and respond to advice and information about beekeeping husbandry and how Defra could improve communications with all beekeepers.

1.2 The Healthy Bees Plan

Honey bees contribute to the country's food security, primarily through crop pollination but also through local food production. They are an essential pollinator of wild plants and therefore contribute to local environmental biodiversity.

Defra and the Welsh Assembly Government (WAG) jointly produced "*Healthy Bees: Protecting and improving the health of honey bees in England and Wales*" known as the Healthy Bees Plan in March 2009. The plan sets out ways to sustain:

"the health of honey bees and beekeeping in England and Wales over the next decade".
The Healthy Bees Plan

In the Healthy Bees Plan Defra committed to the provision of an additional £2.3 million to support the achievement of the five main goals covered in the Healthy Bees Plan.

1.2.1 The five goals of the Plan

The five goals of the Healthy Bees Plan are to:

- keep pests, diseases and other hazards to the lowest levels achievable;
- promote good standards of husbandry to minimise pest and disease risks and contribute to sustaining honey bee populations – prevention is better than cure;
- encourage effective biosecurity to minimise risks from pests, diseases and undesirable species;
- ensure that sound science underpins bee health policy and its implementation; and
- get everyone to work together on bee health.

The last of these is particularly important as the Plan makes it clear that implementation, and thus the safeguarding of the health of honey bees in England and Wales, is dependant upon contributions from individual beekeepers and associations as well as Government input.

1.2.2 Responsibilities

The Healthy Bees Plan emphasises that it is primarily the responsibility of individual beekeepers to manage the health and welfare of their bees. The roles of beekeeping associations are to support beekeepers and work together with Government represented by Defra and WAG to achieve the objectives of the plan. Government will contribute to honey bee health in a number of ways including setting strategic objectives on managing and protecting the health of honey bees in consultation with stakeholders and using the most up-to-date evidence base for decision making and to inform policy and operations.



1.3 Aims of the study

The aims of this study were to enable Defra to have a better understanding of:

- the way that beekeepers decide which husbandry methods to employ, and their experiences of, and attitudes to, these methods;
- how beekeepers' behaviours and practices are influenced by the advice available to them;
- drivers for, and barriers to, new beekeepers adopting good husbandry methods, including examples of good practice and the factors that have promoted good practice; and
- the most effective ways of influencing beekeepers to adopt better husbandry of their bees.

The findings will inform Defra policy making and contribute to more effective communications with beekeepers. The study was confined to beekeepers in England and Wales.

1.4 Methodology

The study comprised the following elements:

- a scoping stage to prepare the team;
- 20 semi-structured qualitative telephone interviews with bee farmers;
- 30 semi-structured qualitative telephone interviews with amateur beekeepers who had two or more years' experience;
- an internet survey of 906 beekeepers and 31 bee farmers; and
- 20 in-depth follow-up interviews conducted by telephone with respondents to the internet survey who had been keeping bees for fewer than two years.

Full details of the methodology, the tools used, analysis methods and the publicity strategy are contained in the technical appendix to this report.

1.4.1 Scoping stage

The scoping stage involved briefing conversations with the Defra team and interviews with five bee inspectors. As well as ensuring that the project team were up-to-date with key issues in the beekeeping community, this stage informed the rest of the study by highlighting the language used by beekeepers and providing an understanding of husbandry practices, pests and diseases, and their treatments which were necessary for the design of the questionnaire and to facilitate telephone interviews with beekeepers. This was supported by a briefing meeting between PSP and EMR in which the project team shared their expertise on beekeeping and social research methodologies.

1.4.2 Semi-structured interviews with bee farmers and beekeepers with two or more years' experience

We conducted semi-structured in-depth telephone interviews with 20 bee farmers and 30 amateur beekeepers with two or more years' experience in England and Wales. The purpose of these interviews was to explore:

- reasons for keeping bees;
- husbandry methods used;
- adaptation of husbandry methods by individual beekeepers;
- sources of information and the role of the National Bee Unit (NBU) and its field inspectors;
- communication channels used by beekeepers; and
- underlying attitudes towards adopting new husbandry practices based on up-to-date science.



1.4.3 Internet survey of beekeepers

The core of the study was an internet survey that explored the following issues:

- what attracted respondents to beekeeping;
- where respondents obtain their information and advice;
- respondents' awareness of pests and diseases;
- training undertaken and who delivered this training;
- the role of the NBU and its network of bee inspectors in England and Wales;
- the role of the NBU's BeeBase; and
- responsibilities of beekeepers in relation to notifiable pests and diseases.

The initial publicity for the survey emphasised that we were especially interested in hearing from those with less than two years' experience, to ensure that the survey achieved a good response from newer beekeepers. Later publicity did not have this same emphasis.

This report is based on 906 responses from beekeepers and 31 from bee farmers.

We know a good deal about the characteristics of the beekeepers who responded to the survey. However, there is no robust data about the national population of beekeepers with which the survey respondents can be compared. Thus, even though we have a large number of respondents, they cannot be said to be representative of any wider beekeeping community. Nevertheless, the findings are indicative of the community's views and experiences and the differences between specific subgroups are enlightening.

Throughout this report, we have only remarked upon differences in internet survey responses that are significant at a 95% confidence interval. The number of beekeepers who responded to each question varies, so base sizes are given for the tables and charts. Percentages may not add up to 100 due to rounding.

1.4.4 Telephone follow-up interviews with beekeepers with less than two years' experience

We conducted 20 follow-up interviews by telephone with internet survey respondents who had fewer than two years of beekeeping experience. These in-depth interviews allowed us to explore in greater detail the key issues identified in their internet survey responses.

1.4.5 Recruitment

Beekeepers could volunteer to take part either by calling Defra or PSP, or directly via the study web page on the PSP website. The study web page introduced the purpose and methodology of the study and reassured potential respondents about anonymity. The study web page directed those with two years' or more experience who were eligible for the telephone interviews to register their contact details. Those with less than two years' experience were directed straight to the internet questionnaire. Once selection of participants for the in-depth telephone interviews was complete, all volunteers were routed directly to the internet questionnaire.

Experienced beekeepers were selected to take part in the in-depth interviews to provide a quota of respondents from each region². Some beekeepers were approached by the bee inspectorate and asked to volunteer because they were deemed to be less likely to become aware of the study through other routes. These were beekeepers thought not to have internet access or much involvement with beekeeping associations.

² The quota was based on NBU regions. There are seven NBU regions in England, plus Wales. The borders of each region can be found on the NBU website.



The Bee Farmers Association (BFA) contacted a random sample of its members to make them aware of the study, and to give them the opportunity to 'opt out'. The BFA then provided a list of names and telephone numbers to the project team, and the sample of bee farmers was drawn from this list.

Full details can be found in the technical appendix.

1.5 Terminology

Throughout this report the following terminology is used.

- **Respondents** – Beekeepers and bee farmers who completed the internet survey.
- **Follow-up interviewees** – Beekeepers with less than two years' experience who took part in a telephone follow-up interview based on their questionnaire responses.
- **Semi-structured interviewees** - Beekeepers with two or more years' experience and bee farmers who took part in in-depth telephone interviews.

1.6 This report

There are five further sections to this report. Section 2 explains why those who contributed to the study took up beekeeping and section 3 discusses current beekeeping practices. Section 4 explores in some detail the information, and its sources, that influence beekeepers. That section covers the use of information prior to starting to keep bees, as well as on-going access to, and use of, information. Section 5 focuses specifically on bee farmers, drawing on both the telephone interviews with bee farmers and the survey responses of those individuals who reported that they were members of the Bee Farmers Association, or that they had 40 or more hives. Finally, section 6 sets out our conclusions and recommendations.

The technical report includes:

- Introduction
- Scoping stage
- Semi-structured qualitative telephone interviews
- Internet survey of new beekeepers
 - Questionnaire development
 - Publicity
 - Response
- Follow-up in-depth interviews
 - Selection criteria
 - Structure

Appendix 1: Semi-structured qualitative telephone questionnaire for established beekeepers

Appendix 2: Semi-structured qualitative telephone questionnaire for bee farmers

Appendix 3: Internet survey questionnaire

Appendix 4: Follow-up topic guide for new beekeepers



2 Profile of Beekeepers

2.1 Introduction

This section describes the characteristics of the 906 beekeepers who responded to the internet survey. Bee farmers who responded are profiled in chapter 5 of this report.

The characteristics we consider are:

- experience;
- location;
- number of colonies;
- age;
- gender; and
- media consumption.

It then explores some of the factors that led respondents to take up beekeeping.

2.2 Characteristics of beekeepers in the internet survey

2.2.1 Experience

The internet survey respondents included long established beekeepers as well as those new to the craft. To ensure a good response from those new to beekeeping, initial publicity emphasised that we were especially interested in hearing from those with less than two years' experience, although later publicity did not have this emphasis. A third (31%) of internet survey respondents had been keeping bees for less than 12 months at the time that they completed the questionnaire. A further one in six (16%) had kept bees for between 12 months and two years with the remainder (just over half) having kept bees for longer; see table 2.1 below for more details.

Table 2.1 Beekeeping experience

How long is it since you started keeping your own bees?	(%)
Less than 12 months	31
More than 12 months but less than 2 years	16
2 years to 5 years	20
6 years to 10 years	10
11 years to 20 years	9
More than 20 years	14

Base: All respondents (906)

2.2.2 Location

This was a survey of beekeepers in England and Wales. The majority of respondents (89%) lived in England with the remaining 11% living in Wales (5.6% of the population of England and Wales live in Wales).

There were at least 50 respondents from each of the seven National Bee Unit (NBU) English regions, with the greatest number living in the South East (222), South (151) and East (144) regions.



2.2.3 Number of colonies

We asked respondents how many live colonies they had to over-winter in the autumn of 2009. Numbers varied widely from none (reported by eleven respondents) up to 40 hives (those with more than 40 hives were classified as bee farmers).

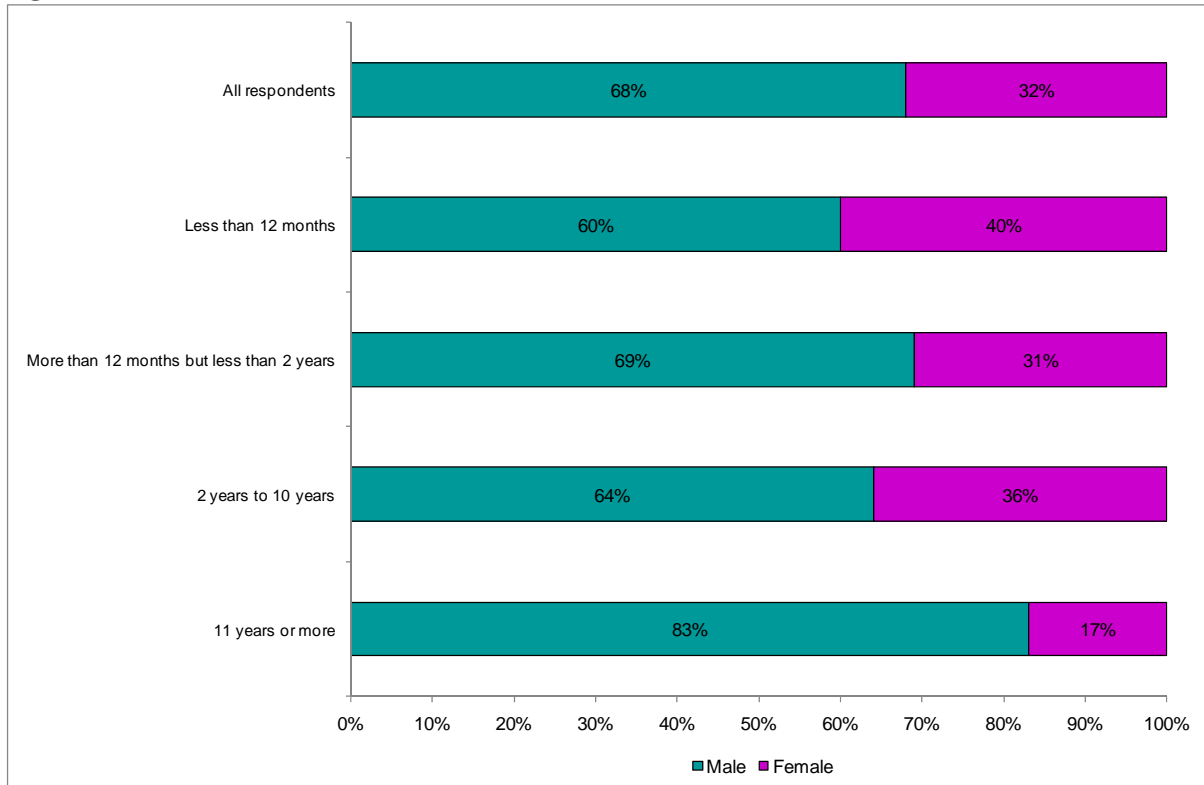
As would be expected, the number of colonies increased in line with the length of time the respondent had been keeping bees. Of those with fewer than two years of experience, 81% had up to two colonies, whereas 74% of those with two or more years of experience had more than two colonies.

2.2.4 Gender

Overall, just over two thirds (68%) of the respondents were male, and just under a third (32%) were female.

A smaller proportion of beekeepers with 11 years of experience or more were women. (See figure 2.1 below).

Figure 2.1 Gender of respondents



Base: All respondents (all who responded – 877) (Less than 12 months – 274; More than 12 months but less than 2 years – 140; 2 years to 10 years – 257; 11 years or more – 206)

2.2.5 Age

The overall age profile suggests a relatively mature population. One third (34%) were under 50, just under a third (27%) were aged between 50 and 59 and rather more than a third (39%) were 60 or older. It is no surprise that those who have been keeping bees the longest tended to be older, but over half (53%) of those who had taken up beekeeping in the 12 months prior to the survey were aged 50 or over.



2.2.6 Media consumption

Of the respondents to the internet survey, six out of ten (63%) listened to Radio 4 ‘regularly’³. A third (32%) regularly listened to Radio 2 and a fifth (21%) listened to Classic FM. One in ten (11%) regularly listened to BBC local radio and the same percentage (11%) listened to other local radio.

Just over a third (36%) did not read any national newspaper at least once a week. About half (49%) read at least one broadsheet newspaper title at least once a week, such as The Times (including The Sunday Times) and the Telegraph (including the Sunday Telegraph), each read by a fifth of respondents (20%) whilst 15% read the Guardian/Observer. Just one in fifty (2%) read a ‘red top’ tabloid newspaper title once a week, whilst 12% read the Daily Mail (including the Mail on Sunday) at least once a week.

In their media consumption habits beekeepers tend to be more ‘high-brow’ than the population in general, suggesting a higher level of income and education than average.

2.3 Reasons for beekeeping

Nine out of ten (89%) of the beekeepers who responded to the survey said that they took up beekeeping out of interest or as a hobby. Almost half (46%) wanted to harvest honey or other bee products for personal use, whereas only 12% wanted to sell honey or other bee products as an extra source of income. However, more than four out of ten (43%) were motivated by the environmental benefits of bees as pollinators and 31% by concern about the declining number of bees.

Table 2.2 Reasons for taking up beekeeping

Why did you decide to take up beekeeping?	(%)
Out of interest/as a hobby	89
Harvest honey/bee products for personal use	46
Environmental benefits of bees as pollinators	43
Concern about declining numbers of bees	31
To sell honey/bee products	12
Other reason	10

Base: All respondents (906)

The fundamental importance of ‘general interest’ was reflected in the qualitative work. In the semi-structured telephone interviews with beekeepers who had been keeping bees for two or more years, a number of interviewees referred to a general interest or having their interest captured by an event or training session, sometimes advertised in the local newspaper or through other local channels. These interviews also suggested that personal contacts, such as friends, family members and informal networks were important:

“[My] father kept bees.”

Male, two or more years’ experience, semi-structured interviewee

“Some people in my wine-making group were beekeepers... I slid into it.”

Male, two or more years’ experience, semi-structured interviewee

The internet survey found that two thirds (66%) of newer beekeepers with less than two years’ experience were motivated to start keeping bees by the environmental benefits and/or concern about the declining number of bees, compared to just one third (31%) of those with two or more years’

³ Respondents were asked which radio stations they listened to ‘regularly’; regularly was therefore self-defined.



experience.

Whilst results from the internet survey suggest that recent publicity about declining bee numbers may have attracted many of those who started beekeeping recently, responses to the follow-up telephone interviews with newer beekeepers demonstrate this more clearly. One interviewee said:

“It’s high profile at the moment, there’s a lot in the news. I’m a big environmentalist and when I heard that the bee population won’t survive without any human input any more then I thought I’d better do something about it or see if I can help.”

Female, less than two years’ experience, follow-up interviewee

Other follow-up interviewees expressed concern over people’s motivations. One interviewee suggested beekeeping was a bit *“bandwagon-ish at the moment”*, while another suggested some were not fully prepared before taking up beekeeping.

“It does concern me slightly that like the campaign that the RSPCA had, ‘A dog’s for life not just for Christmas’, people might be going into beekeeping for the wrong reasons... with little or no knowledge, thinking I’ll get a colony of bees and every summer I’ll get loads of honey and give it to my friends. It’s not quite that easy.”

Male, less than two years’ experience, follow-up interviewee

Some of the follow-up interviewees were asked whether their beekeeping experiences matched their expectations. Several reported that they had become more involved and enjoyed it more than they had expected. A number had found that beekeeping was more involved and time consuming than they had anticipated. The follow-up interviewees we spoke to tended to find beekeeping very rewarding, and to be prepared to learn from experience:

“It’s given me more than I expected. I find it very, very soothing, just to sit down there in the summer amongst them. It’s a lot more involved than I expected. I thought you literally just put a box at the end of the garden and let them get on with it; you don’t have to do anything. I wasn’t aware of this weekly sort of task, and I think actually it’s good to make sure that I’m doing this weekly task. But where I got it wrong and they swarmed, it probably gave me a lesson.”

Male, less than two years’ experience, follow-up interviewee

2.4 Attitudes to beekeeping practices

In the internet questionnaire respondents were asked for their views on seven statements on a five point scale: strongly agree, agree, neither agree nor disagree, disagree or strongly disagree. The overall responses to these questions are presented in table 2.3 below



Table 2.3 Attitudes to beekeeping

Statement	Strongly agree (%)	Agree (%)	Neither /nor (%)	Disagree (%)	Strongly disagree (%)
Old methods are better than new ones (base: 899)	2	7	43	40	8
Modern beekeeping methods cause colony losses (base: 899)	4	17	47	26	5
Beekeeping should be chemical free (base: 905)	15	32	36	15	2
You have to be vigilant or your colonies will die (base: 903)	41	46	9	3	1
It is important to keep up to date with the latest husbandry advice (base: 904)	52	43	4	1	1
I prefer to learn from other beekeepers (base: 899)	10	27	52	9	1
I prefer to learn from written information (base: 900)	2	10	56	29	3

The statements explored views on three different themes; information preferences, modern husbandry techniques, and the importance of vigilance and being up-to-date. The following section discusses responses to each of these areas in turn.

Modern husbandry methods

These statements reveal that whilst a majority of beekeepers endorsed the need for modern beekeeping methods, this belief is more prevalent among those with more experience and a larger number of colonies. Even so, nearly half of respondents (47%) aspired to chemical free beekeeping.

Very few (9%) agreed or strongly agreed with the statement ‘beekeeping is an ancient craft and old methods are better than new ones’, and nearly half (48%) disagreed or strongly disagreed with it. Those who disagreed were likely to have been keeping bees for two or more years, and to have three or more colonies.

Approximately two in ten (21%) respondents agreed or strongly agreed that ‘modern beekeeping methods cause colony losses’ and about three in ten (32%) disagreed or strongly disagreed, and about half (47%) neither agreed nor disagreed. Those who disagreed were more likely to have six or more colonies, and to have been keeping bees for 11 years or more.

Nearly half of respondents (47%) agreed or strongly agreed with the aspiration ‘beekeeping should be chemical free’ and only two in ten (17%) disagreed or strongly disagreed. Those who had been keeping bees for 11 years or more were somewhat more likely to disagree (24%) than those with less than 12 months’ experience (14%). This reflects the pro-environmental motivations we have noted among the newer cohort of beekeepers. However, it may also reflect a relative lack of experience in dealing with pests and diseases. One follow-up interviewee with less than 12 months’ experience recounted how he had aspired to retain chemical free colonies and had answered the questionnaire accordingly, but had since found a high varroa count in his colonies. He has sought advice from experienced beekeepers at his association and will now apply a chemical treatment to the hives.

Vigilance

A large majority of beekeepers accept the need for vigilance and keeping up-to-date with the latest husbandry advice.



The majority (87%) of beekeepers agreed that 'you have to be vigilant or your colonies will die', with a small minority (4%) having disagreed.

The majority (94%) of beekeepers agreed that 'it is important to keep up-to-date with the latest husbandry advice', and about half (52%) strongly agreed. Those with two or more years' experience were more likely to strongly agree (58%) than those with less than two years' experience (45%).

Information preferences

Information preferences tended to reflect level of experience. Newer beekeepers were more likely to express a preference for obtaining information from other beekeepers by 'word of mouth' or from practical demonstration. Other information from the questionnaire and from the telephone follow-up interviews demonstrates that newer beekeepers often placed great trust in the advice of more experienced beekeepers that they have met at local association meetings.

More than a third of respondents (38%) agreed strongly or agreed to the statement 'I prefer to learn from other beekeepers rather than written information', whilst about half (52%) neither agreed nor disagreed with this statement. Only one in ten (11%) disagreed. Answers given to this statement were re-enforced by answers to subsequent questions, as those who agreed with this statement tended to say that they would most likely go to friends or contacts for information about treatments for pests and diseases.

Those who agreed with the statement 'I prefer to learn from other beekeepers rather than written information' tended to be less experienced than those who gave other answers: 48% of those with less than two years' experience agreed compared to 29% of those with more experience. They were also likely to have fewer colonies (47% of those with one or two colonies agreed compared to only 20% of those with six or more colonies).

As expected, patterns of response were reversed to the statement 'I prefer to learn from written information than from other beekeepers'. About one third (32%) of beekeepers disagreed with the statement, and the characteristics of this group are similar to those who agreed that 'I prefer to learn from other beekeepers than from written information'.

2.5 Conclusion

The beekeepers who responded to the internet survey were predominantly male and over 50 years of age, and their media consumption suggests that they are relatively well educated and affluent.

As a group, there is not great support for 'traditional' methods over more modern approaches. However, many beekeepers aspire to not using chemicals, especially newer beekeepers. This may be because newer beekeepers have been attracted to the craft by publicity surrounding the declining bee population and are more likely to have pro-environmental motivations. It is also likely that greater experience of dealing with pests and diseases leads beekeepers to use chemicals as a pragmatic control measure.

The beekeepers who took part in this study tended to be very aware of the importance of being vigilant in order to prevent colony loss. Whilst many have an aspiration to keep their colonies chemical free, nearly all are conscious of the benefits of keeping up to date with the latest husbandry advice. These widely held attitudes to beekeeping resonate with the aims of the Healthy Bees Plan.

Less experienced beekeepers were more likely to prefer obtaining information from other beekeepers rather than from written sources such as magazines and websites. This may reflect the practical nature of the 'craft', basic elements of which may be difficult to learn from books or magazines alone. More experienced beekeepers that were likely to have a greater degree of confidence in their practical skills were more likely to prefer written sources of information.



3 Practices

3.1 Introduction

This section looks at husbandry practices, awareness and experiences of pests and diseases and knowledge of regulation, highlighting differences between specific groups where they appear important.

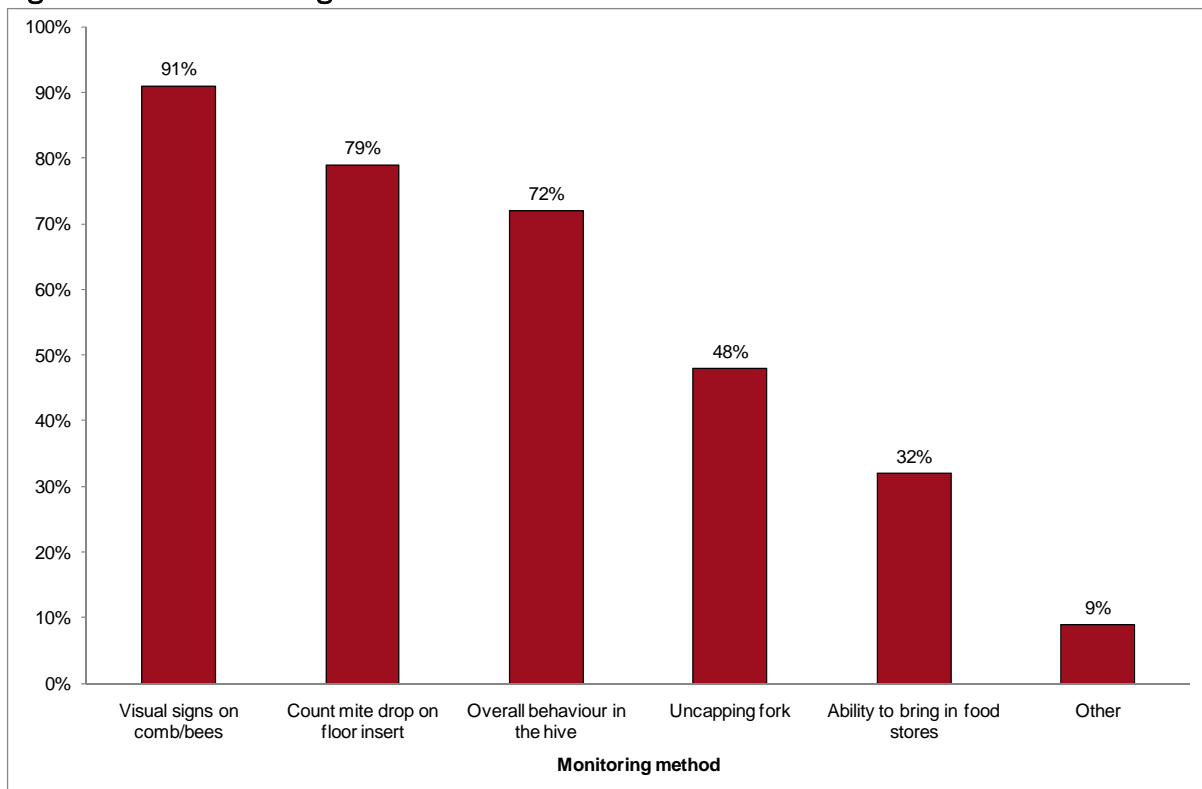
3.2 Husbandry practices

Almost everyone who took part in the survey said that they regularly monitored their bees for pests and diseases (97%).

3.2.1 Pest and disease monitoring methods

Most respondents were using more than one monitoring method but looking for visual signs on the comb or the bees was most common and used by almost all respondents (91%). See figure 3.1 below.

Figure 3.1 Monitoring methods used



Base: All who regularly monitor for pests and diseases (868)

Around eight out of ten respondents (79%) measured the 'mite drop' and seven out of ten (72%) looked at the overall behaviour in the hive. Half used the 'drone brood uncapping' method (48%). Fewer looked at the ability of the bees to bring in food stores (32%).

Beekeepers with less than two years' experience were more likely to measure the mite drop than more experienced beekeepers (84% compared with 75%, respectively). More experienced beekeepers were much more likely to use drone brood uncapping (62% of experienced beekeepers compared with 32% with less than two years' experience).

We conducted multivariate analysis to identify which characteristics of beekeepers were associated with their monitoring behaviour. This identified that those who were well integrated into the beekeeping



world, having a larger number of beekeeping contacts and awareness of BeeBase, tended to use a larger number of monitoring methods.

3.2.2 Frequency of monitoring

Half (48%) of those who monitored their hives during the season did so at least once a week and a further third (30%) at least every 10 to 12 days. Almost all other respondents monitored at least every two weeks (14%) during the season, with about one in ten (8%) monitoring their hives less often.

Those who had been keeping bees for less than two years were more likely to monitor their hives weekly during the season than those who had kept bees for longer (58% compared to 40%).

The 62 respondents who monitored their hives less often than once every two weeks during the season were asked whether they thought they were monitoring often enough. Three quarters of these said that they felt their monitoring was often enough but about a quarter (23%) said that they thought that they did not monitor their hives often enough, mainly because of lack of time.

3.2.3 Controlling for varroa

Virtually all respondents (96%) said that they controlled for varroa. The telephone follow-up interviews with beekeepers with less than two years' experience explored why some did not control for varroa. These few interviewees cited low levels of infestation and allowing bees to build up their own immunity as explanations.

By far the most common control for varroa was Apiguard, used by 73% of respondents. The other methods used by more than half of those who control for varroa were the open mesh floor, used by 57%, and oxalic acid in some form, used by 53%. Other common measures included dusting icing sugar/ground rice (35%), drone comb removal (32%), shook swarm (16%), Apistan, (18%), and artificial swarm (15%). Table 3.1 gives a list of control methods and the percentage using each method.



Table 3.1 Varroa controls used

Treatment	(%)
Apiguard	73
Open mesh floor	57
Oxalic acid (solution pre mix)	36
Dusting icing sugar/Ground rice	35
Drone comb removal	32
Oxalic acid (solution self mix)	18
Shook swarm	16
Apistan	18
Swarm (artificial swarm)	15
Bee Vital Hive Clean	11
Thymol crystals	10
Bayvarol	8
Formic acid	3
Apivar	3
Api-Life Var	2
Lactic acid	2
Oxalic acid (sublimation)	2
Exomite apis	2
Queen comb caging	1
Thymomite	1
CheckMite+	0
Perizin	0
Other	8

Base: All respondents who control for varroa and responded to the question (873)

We conducted multivariate analysis to identify which characteristics of beekeepers were associated with using a larger combination of controls. The most important characteristic was the number of colonies. Those who had six or more colonies used the largest combination of controls (4.7 on average), whilst those who had one or two colonies used 2.7 controls on average. Other important characteristics included the length of beekeeping experience and whether or not beekeepers were aware of BeeBase. Those with one or two colonies who had been keeping bees for less than two years and were not aware of BeeBase used the lowest average number of controls (2).

The semi-structured interviews with established beekeepers revealed an awareness that resistance to treatments can develop. This was a reason for switching treatment method – either because resistance had developed or to prevent resistance.

Most respondents who control for varroa (72%) indicated that they decided how to control based on best practice guidance/most up-to-date information. However, two thirds (66%) made decisions based on the time of year, half (50%) on the varroa count and a third (37%) on whether honey was being harvested.



Integrated Pest Management

Integrated Pest Management (IPM) is a technique used to keep levels of pests below the level where they cause significant harm, by using a combination of controls applied at different times of the year. More or fewer controls are employed depending on the levels of pests present. We analysed responses for beekeepers who used a combination of chemical and non-chemical methods, and who said that they chose controls based on the varroa count and the time of year. This behaviour broadly corresponds to IPM. About a third (35%) of respondents met this condition.

Multivariate analysis identified characteristics of beekeepers associated with using IPM. Indicators of being well integrated into the beekeeping world, such as awareness of BeeBase and a wide range of contacts among other beekeepers, were the most important factors. Those who were aware of BeeBase, had self-registered and who knew more than ten other beekeepers were more likely to report having used IPM (54%). Few of those who were not aware of BeeBase appeared to use IPM (15%).

Choosing husbandry methods

The follow-up interviews with beekeepers with less than two years' experience revealed that new beekeepers often considered recommendations from other beekeepers at local associations or on internet fora and that this was a key factor in deciding which methods to use. They also reported using their own judgement based on the information they had available, to decide which monitoring methods and treatments to use, given the area in which they lived and their observation of their own bees. A few respondents highlighted the need to focus on their own bees when deciding on 'best practice'.

"I think best practice is watching your bees and seeing what they're doing, because they're trying to communicate to you, aren't they? I mean, not in a kind of clairvoyant sense or anything like that, but their behaviour is going to be needs-led, so if you're studying the behaviour then I think, you know, that's pretty good husbandry really."

Female, less than two years' experience, follow-up interviewee

In the telephone interviews, many of the beekeepers with less than two years' experience pointed out that beekeepers had different opinions about hive management and that advice was often conflicting. Some reported *"trying things out"* to see if they worked, while others followed the advice of their local association. Some interviewees reported that they were not comfortable with the methods they were using, for example using chemicals, smoking and marking and clipping bees, but said that they did not yet feel confident enough to move away from standard advice. They were however considering changing their practices in the future. Some interviewees reported that they would change practices as methods or advice developed or because of *"making the mistakes"*, others felt that their practices would change as they became more experienced.

"Well, I mean so far I've just made a judgement and pursued one sort of course of action really. I mean as the years go by I have no doubt I shall try out different things."

Male, less than two years' experience, follow-up interviewee

A number of the beekeepers with less than two years' experience interviewed by telephone outlined the difficulties faced in deciding on best practice because of the range of information available.

"It's easy to decide what's really bad practice, but deciding what's best practice out of the good practice is quite difficult because there's a lot of conflicting information. All you can get is advice on what people are using, you don't know in what ways they came to that decision and what necessarily they were thinking when they decided they were going to do something in that particular way."

Male, less than two years' experience, follow-up interviewee

One interviewee called for the Government to impose specific treatments through regulation.



Changing brood combs

Three quarters of respondents to the internet survey indicated that they changed the brood combs. While nine out of ten (91%) of those with two years' or more experience of keeping bees did so, 58% of those with less than two years' experience of beekeeping did. As the recommended turnover time for brood combs is three years, this difference is not surprising.

Shook swarm technique

About three in ten respondents (28%) used the shook swarm technique. Beekeepers with two or more years' experience (39%) and those registered on BeeBase (36%) were more likely to use it than beekeepers with less than two years' experience (16%) and those not aware of BeeBase (14%). However, this technique is more appropriate for some pests and diseases than others.

3.3 History and awareness of pests and diseases

When asked which pests and diseases their bees had suffered the most commonly cited was varroa – 86% of respondents said that their bees had experienced varroa. Nearly half had suffered from chalkbrood (44%) and just under a quarter (22%) from Nosema. Additionally, 6% had experienced acarine, 6% sacbrood, 5% European foulbrood (EFB) and 2% American foulbrood (AFB). One in ten (11%) had experienced none of these.

Generally, as might be expected, the longer a respondent had been keeping bees the more likely it was that their bees had experienced each of these pests and diseases.

Almost all respondents whose bees had suffered from a pest or disease said that they diagnosed it themselves (93%) but a quarter (26%) said a bee inspector had made the diagnosis and 14% said the diagnosis had been made by someone else. The telephone interviews with beekeepers confirmed that varroa was often diagnosed by beekeepers themselves, but inspectors were called in where notifiable pests and diseases, particularly AFB and EFB, were suspected.

Respondents with two years' or more experience were more likely to have had a diagnosis made or confirmed by a bee inspector than those with less experience (36% compared with 13%). This is unsurprising considering that those who had been keeping bees for longer were more likely to have experienced notifiable disease in their colonies and to have been visited by the bee inspectorate. Follow-up telephone interviews revealed that many of those with less than two years' experience sought advice from local beekeepers, such as those at their association, and were often referred to the inspector if it was considered necessary.

"I think the first thing is, if I thought it was serious I would get a fellow member to look at the hive, and if they gave me the nod and they thought it was serious and the inspector came [they would look into it]."

Female, less than two years' experience, follow-up interviewee

Respondents to the internet survey were also asked how confident they felt of being able to correctly diagnose a problem in the hive. Some 9% of respondents indicated that they were 'very confident' of being able to correctly diagnose a problem in the hive, while 68% answered 'fairly confident'; 21% answered 'not very confident' and 2% answered 'not at all confident'.

The confidence beekeepers expressed in their own knowledge and recognition of pests and diseases is related to their experience both in years and the number of colonies they kept. Those with two years' experience or more were more likely to be 'very confident' than those with less than two years' experience (13% and 3% respectively). Those with six or more colonies were more likely to be 'very confident' (23%) than those with one or two colonies (3%).

3.3.1 Colony loss

One in five (21%) respondents to the internet survey reported that they had lost all or most of their colonies in one season. As one would expect, those who had been keeping bees for two years or more



were more likely to have lost all or most of their colonies (30%) than those with less experience (11%). The in-depth interviews with established beekeepers confirm that colony loss is a concern for experienced beekeepers, not just a problem afflicting inexperienced beekeepers.

Some of the in-depth interviewees with two or more years' experience reported having changed their husbandry methods as a result of having suffered large colony losses in the past. For some, colony loss was an experience that prompted them to reflect on their husbandry methods and to search for new techniques.

3.3.2 How has beekeeping changed?

Beekeepers with two or more years' experience who took part in semi-structured interviews were asked if they felt beekeeping had changed as a craft since they first started. The large majority of respondents felt that beekeeping had become more labour intensive because of the increase in pests and diseases, in particular varroa. Interviewees reported that whereas in the past it was possible to be a *"leave alone beekeeper"*, the situation now meant that bees were livestock that needed to be constantly maintained. Other words used to describe how beekeeping had changed included:

- more sophisticated;
- more technical;
- more expensive; and
- more regulated.

3.3.3 The future

The telephone interviews with beekeepers with two or more years' experience found beekeepers somewhat pessimistic about the future with respect to the prevalence of disease. Interviewees expressed a feeling that they had a constant battle against pests and diseases, particularly varroa, and that this situation was worsening for a variety of reasons, including imported bees and wet summers. This prognosis was supported by the internet survey in which 50% of respondents indicated that their bees were 'very likely' to be affected by pests and diseases in the future while 39% responded that it was 'fairly likely'.

Some of those interviewed by telephone with two or more years' experience believed that British bees were adapted to the British climate. Climate change more broadly was therefore identified as an issue and was said to *"confuse the bees"*.

These telephone interviewees recognised that beekeeping is changing. There was widespread recognition that keeping bees is more time consuming now compared with in the past because of the need for the active management of hives. Several interviewees used the same phrase to sum-up this sentiment:

"I used to keep bees, now I am a beekeeper."

Female, two or more years' experience, semi-structured interviewee

Those with two or more years' experience who were interviewed by telephone were also aware that their behaviour had changed over time as they grew more confident and learned more and in response to changing circumstances. Nevertheless, the actual techniques were said to have changed very little.

Some of those with two or more years' experience who were interviewed by telephone voiced concern about a small number of 'older' beekeepers who were not taking on board new ideas and were resistant to, or ignorant of, the need for more active hive management to combat disease. Some felt that such beekeepers posed a disease threat to their own colonies, since they may not be registered with the bee inspectorate and could therefore maintain diseased hives without detection. However, the great majority of beekeepers who took part in this study, both through interview and internet survey, were aware of the threat of pests and diseases and were interested in learning to update their husbandry methods.



3.4 Knowledge of regulation

Almost all the respondents (97%) were aware that by law some diseases and pests must be reported to the bee inspectorate. However, as this question required either a 'yes' or 'no' box to be checked, respondents who were unaware may have been reluctant to admit their ignorance.

The telephone interviews with beekeepers who had two or more years' experience found that these beekeepers were much more likely to identify AFB and EFB as notifiable pests and diseases than small hive beetle or *Tropilaelaps* mites. These last two have not been found in the UK and these interviewees were being asked to recall information without the aid of prompts.

Beekeepers with two or more years' experience who took part in semi-structured interviews were also asked if they were aware of any other legal requirements relating to beekeeping; the responses given are summarised below.

- Regulations relating to the handling, food safety, weighing and labelling of honey.
- Regulations relating to feeding bees with sugar and honey.
- Regulation relating to the positioning of hives and the protection of neighbours.
- Restrictions on moving bees between countries.
- Gaining permission from landowners before using land to hold bees.
- Maintaining records of bee treatments used.
- General good practice and acting responsibly.

Very few of the beekeepers we interviewed over the telephone were aware of the legal requirement to keep a list of treatments applied to the hive. This requirement is intended to facilitate investigation if toxic substances are alleged to have entered into the human food chain.

3.5 Conclusion

Husbandry behaviour is related to two main factors:

- how experienced the beekeeper is, in years and the number of colonies that they manage; and
- how well 'networked' they were into the beekeeping world, including the number of other beekeepers that they know and awareness of, and registration on, BeeBase.

We have seen that more experienced beekeepers are likely to use a larger number of controls, and to feel more confident about their ability to correctly diagnose a problem in the hive. Integrated Pest Management (IPM) is recommended by the NBU as "*a much more effective approach than the alternative*"⁴. Only a minority (35%) of the beekeepers who responded to the survey appeared to use IPM techniques, but the factors most strongly associated with this behaviour are awareness of, and self-registration on, BeeBase, and contact with a large number of other beekeepers.

In-depth interviews with experienced beekeepers found that pests and diseases are thought to pose a significant and increasing challenge to beekeeping in the UK. Some felt that this could be made worse by climate change.

Nearly all of the beekeepers who took part in this study were aware of their duty to report notifiable diseases to the bee inspectorate. However, in-depth interviews with experienced beekeepers revealed that very few were aware of their legal requirement to keep a list of treatments they apply to their colonies. Defra may wish to raise the profile of this area of regulation amongst the beekeeping community.

⁴ Managing Varroa, FERA, 2009



4 Influences

4.1 Introduction

This section covers a range of factors that might influence beekeeping practice, including:

- membership of beekeeping associations and participation in association activities;
- training prior to keeping bees;
- training undertaken since first obtaining bees and future training requirements;
- sources of information about beekeeping, including publications and websites;
- the role of the NBU; and
- the role of informal networks of beekeepers.

Each of these is explored in the following sub-sections.

4.2 Beekeeping associations

4.2.1 Membership of beekeeping associations

The overwhelming majority (98%) of the survey respondents were members of a beekeeping association. One of the routes used to promote awareness of this study was via beekeeping associations, so this finding may not be surprising and it should not be assumed that membership of an association is necessarily so prevalent throughout the beekeeping community.

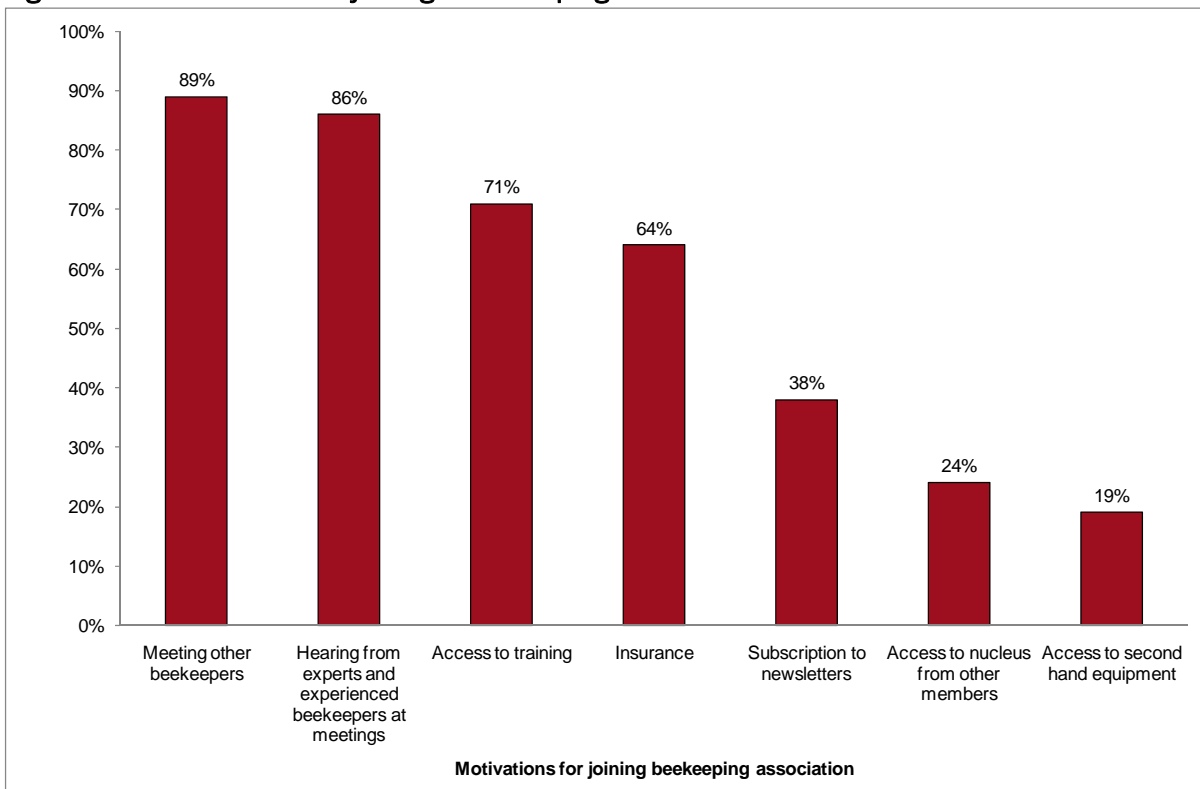
Just over two thirds (67%) of respondents were members of the British Beekeeping Association (BBKA) and 65% of the respondents from Wales were members of the Welsh Beekeeping Association (WBKA). Eight out of ten (80%) respondents were members of a local beekeeping association affiliated to either the BBKA or the WBKA. Almost all of the respondents (88%) attended meetings at their local beekeeping association.

4.2.2 Reasons for joining a beekeeping association

Respondents reported wide-ranging reasons for joining a beekeeping association as shown in figure 4.1. The top three reasons were: to meet other beekeepers; to hear from experts and experienced beekeepers at meetings; and for access to training.



Figure 4.1 Reasons for joining a beekeeping association



Base: All who are members of an association and responded (888)

The motivating factors did not vary much according to the characteristics of the individual beekeepers. However, there is an indication that newer beekeepers were more likely to cite access to other people, training or equipment as reasons for joining a beekeeping association.

The semi-structured telephone interviews with beekeepers with two or more years' experience revealed that, on the whole, membership of an association was "invaluable". The telephone interviews found that while membership provides insurance and that is appreciated, and keeping up-to-date and access to more formal talks and training is useful, it is the ability to discuss specific issues and talk informally with experienced beekeepers that seems to be most valued.

This response was mirrored by the beekeepers with less than two years' experience in the follow-up telephone interviews. When asked if they got what they had expected out of membership many respondents said that they had, and more.

"I think more so really, the good thing about it is you can build up contacts, and there's an exchange of ideas and there's always help."

Female, less than two years' experience, follow-up interviewee

This group also identified the importance of practical sessions and visits to an apiary for newer beekeepers. However, it was the support from other beekeepers which interviewees identified as key and the "reassurance" that they gained from listening to the experiences of other members.

"Yeah, and moral support as well, you think you're the only one having any problems with anything and then you find everybody else has gone through the same hurdles, and it's quite reassuring really."

Female, less than two years' experience, follow-up interviewee



The majority of follow-up interviewees emphasised the supportive nature of their local association and commented on the willingness of other beekeepers to help. Many interviewees had a 'mentor' assigned by their local association to provide support and guidance.

"They gave numbers of local beekeepers and they made it clear that if you had any questions to give somebody a call...they were really incredibly supportive."
Female, less than two years' experience, follow-up interviewee

Many follow-up interviewees identified the local association and the members as the most important source of information.

"The most important is really from the experienced beekeepers in the association; they've retired and they keep themselves up-to-date with current information."
Male, less than two years' experience, follow-up interviewee

The importance of local associations as a source of information is explored further in section 4.5 below.

4.3 Training before obtaining bees

Two thirds (66%) of those who answered had some sort of training before they owned their own hives. Those who had been keeping bees the longest (11 years or more) were the least likely to have had training before owning their own hives. Just under half of this group (43%) reported undergoing this sort of early training.

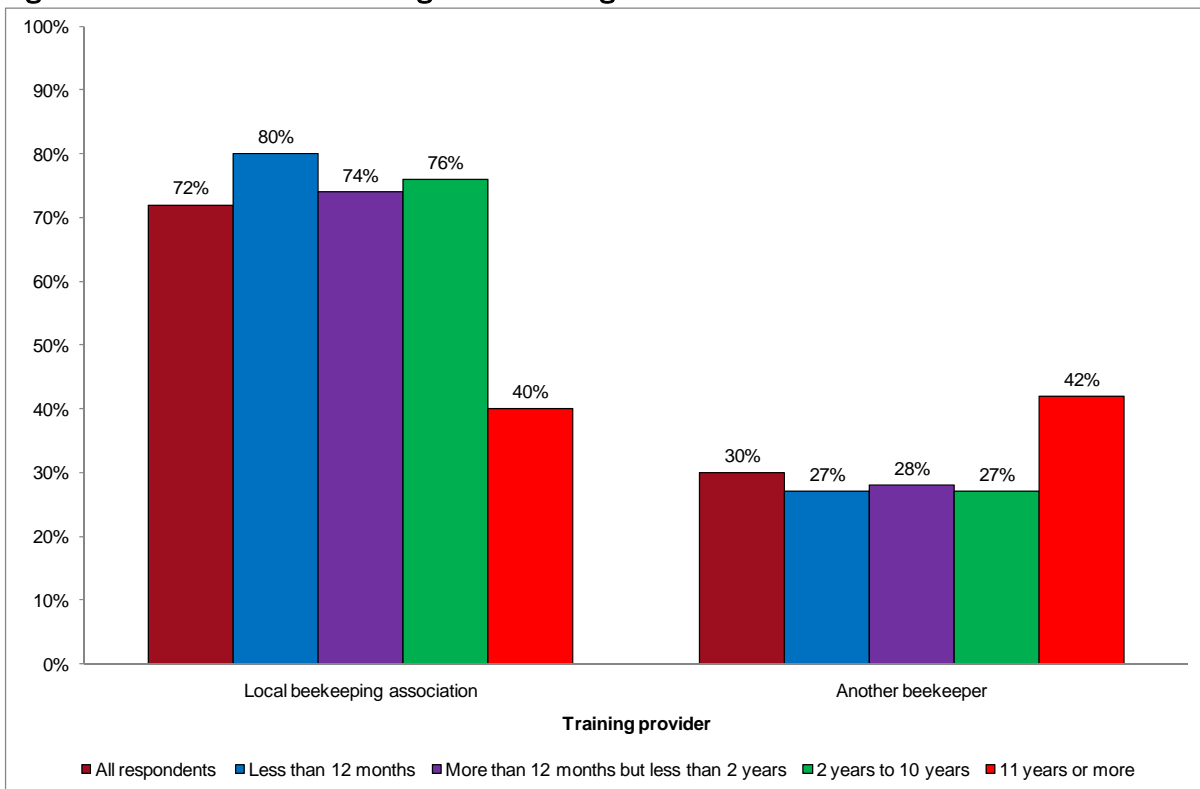
The telephone interviews with beekeepers with two or more years' experience found that some of those who had not had training before keeping bees had family or sometimes friends who had owned bees and they had spent time watching others handle their bees before taking it up. Beyond this, initial information sources tended to be books, beekeeping courses, beekeeping associations and personal contacts with beekeepers. Initial information sources are explored further in section 4.5.1.

4.3.1 Providers of training before owning hives

For those who had training before owning hives there were two principal providers, local beekeeping associations (72%) and other beekeepers (30%). Local beekeeping associations were a more important source of training before owning hives for those who started keeping bees within the last ten years. (See figure 4.2 below). Formal training by county bee lecturers' at local agricultural colleges was mentioned by some more experienced beekeepers, although this system is no longer operating.



Figure 4.2 Provider of training before owning hives



Base: All respondents (all who received training before owning hives – 551) (Less than 12 months – 202; More than 12 months but less than 2 years – 95; 2 years to 10 years – 170; 11 years or more – 84)

Some follow-up interviewees with less than two years' experience expressed difficulty in getting on to training courses because of high demand.

4.3.2 Content/scale of training before owning hives

The follow-up interviews with beekeepers with less than two years' experience also revealed some of the content and scale of the training. Training varied from evening training courses run over six weeks to two day training sessions. Courses covered basic theory, general husbandry practices, details of pest and disease recognition and often included a practical session or visit to an apiary. Some interviewees mentioned BBKA training modules. Many interviewees highlighted the practical aspect as the most important part of training.

“I think that going to see people doing things practically is hugely educational. I’ve grown up with books, academically, I’ve always just bought the book and taught myself, I’ve even taught myself knitting from a book, but actually watching people knitting, even on YouTube, is far more informative.”

Female, less than two years' experience, follow-up interviewee

4.3.3 Usefulness of training before owning hives

Of those who had training before they owned their own hives, virtually all (99%) found it 'beneficial' and the great majority (90%) found it 'very beneficial'. One telephone interviewee with two or more years' experience believed that attending a course prior to getting bees should be compulsory and another described the benefits of attending a course before getting bees very clearly:

“It is an insight into what is required from you. It made you realise that it wasn't just a romantic idea about opening up a hive and getting out honey, it is a commitment and an expense.”

Female, two or more years' experience, semi-structured interviewee



The follow-up interviews with beekeepers with less than two years' experience confirmed the importance of training in advance of owning bees. A few who had no or limited training before owning their own hives admitted that on reflection having more knowledge before they started would have been helpful.

Others commented that even though pre-training was helpful, it cannot fully prepare new beekeepers for what to expect.

"I think at the end of that quite a few of us felt like 'oh yes, we do have quite a good idea about beekeeping now', but it's not until you start, and bees are individual creatures so they kind of do what they want to do really, and it's learning about looking for signs and being proactive."
Female, less than two years' experience, follow-up interviewee

4.4 Courses/talks since obtaining bees

The respondents to the internet survey regarded it as very important to keep up-to-date with bee husbandry advice. Overall 94% of the respondents agreed that 'It is important to keep up-to-date with the latest husbandry advice' and 52% strongly agreed. It is therefore no surprise that the great majority of respondents (89%) reported that they had attended courses or talks to learn about beekeeping since they had owned their own hives and that even more (94%) indicated that they would like to attend training, talks or courses in the future.

Past uptake of learning opportunities was more prevalent amongst more experienced beekeepers, with 82% of those with fewer than two years' experience having attended courses or talks compared with 94% of those with two years' or more experience. However, intentions to attend training in the future were much more comparable (93% of those with two years' or more experience, compared to 96% for those with less than two years' experience).

The telephone interviews found that some of the beekeepers with two or more years' experience felt that they would not learn anything new from attending courses. Others were keen to learn as much as possible and to go to as many as talks as possible. Many were themselves speakers. Some of those who were trainers or speakers were being asked to attend 'train the trainer' courses, and while most were enthusiastic about this, concern was also expressed that this approach was *"too bureaucratic"*. One respondent commented that he was very experienced and he did not think amateur beekeepers would be interested enough in training to complete a qualification and attend evening classes; he was concerned that this training should not be compulsory.

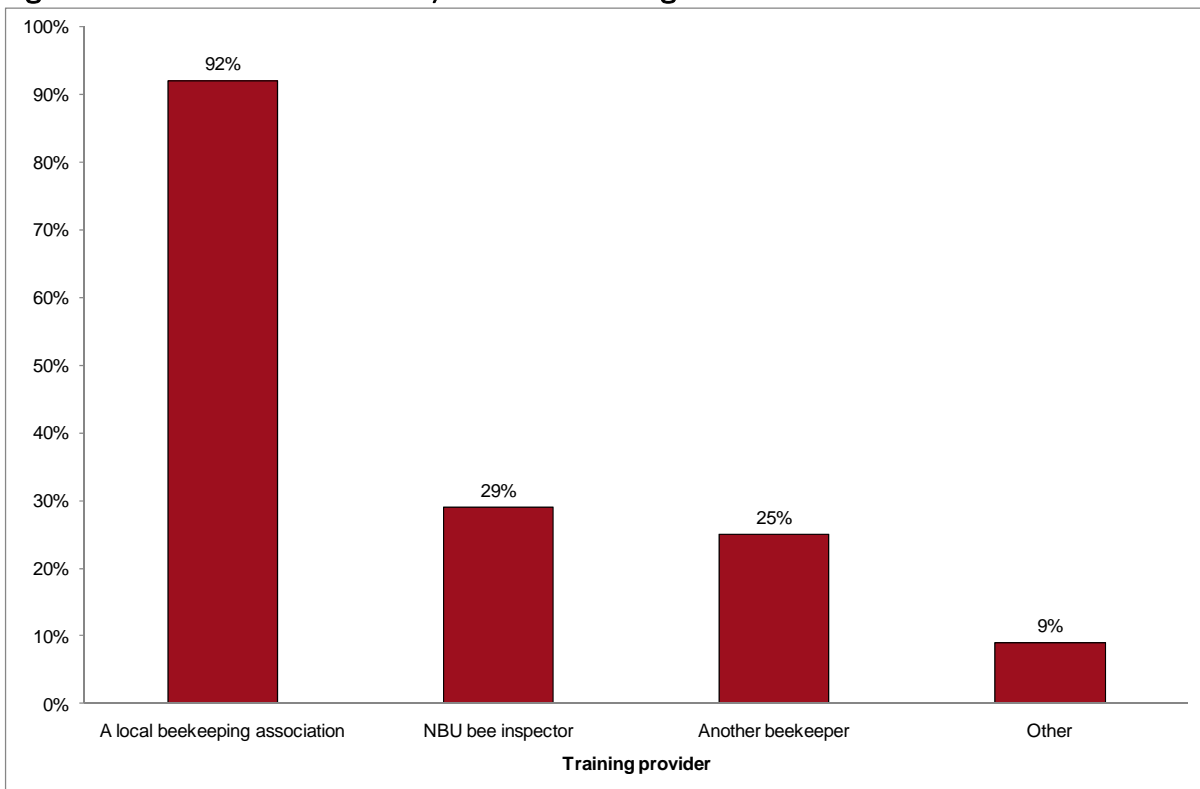
The internet survey showed that the barriers to attending talks, apart from not being interested in the topic or attending courses in general were mainly to do with the location of the talk and its distance from the beekeeper.

4.4.1 Providers of courses/talks

The internet survey found that local beekeeping associations, NBU inspectors and other beekeepers were all important providers of on-going training as shown in figure 4.3.



Figure 4.3 Provider of courses/talks since owning hives



Base: All who have attended courses or talks since owning hives and responded (802)

Several interviewees with two or more years' experience reported that they themselves had become involved in training new beekeepers, often through the local association. However, there was some concern expressed by a few beekeepers with two or more years' experience that the large uptake of beekeeping and the lack of courses may have led to relatively inexperienced beekeepers becoming trainers, which could impact on the quality of training.

4.4.2 Subject matter of courses/talks

The most popular courses/talks were those on general husbandry techniques. The great majority of respondents who had attended courses or talks (91%) had attended this sort of event and attendance levels were similar across all types of respondents.

As would be expected, more experienced beekeepers were more likely to have attended talks on a range of more specialised subjects. Some 90% of respondents with two or more years' experience had attended courses/talks on control of pests and diseases compared to 76% of respondents with less than two years' experience, while 81% of respondents with two or more years' experience had attended courses/talks on preventing colony loss compared to 61% of respondents with less than two years' experience.

Interviews with beekeepers of all levels of experience revealed that while some interviewees selected courses because of the topic, others regularly attended local association sessions, and the particular topic was less important.

“Well I suppose, the weekly one at the beekeepers association, I mean that’s easy, I just go every week sort of thing, you know that’s not really a problem, it’s just on a continuous learning basis really.”

Male, less than two years' experience, follow-up interviewee



4.4.3 Usefulness of courses/talks

Overwhelmingly, the respondents who had attended courses or talks reported that they were beneficial. Just under three quarters (72%) reported that participation had been 'very beneficial' with a further quarter (26%) viewing them as 'fairly beneficial'.

The follow-up interviews with beekeepers with less than two years' experience revealed that practical courses run by experienced beekeepers were seen as particularly valuable. The opportunity to ask questions and access to tools such as microscopes were seen as particularly important. One respondent commented that if he had attended courses before getting bees it would have impacted on his approach.

"It was run by experienced beekeepers and it was kept very simple, and it was structured very well, it was just an excellent course. I had I think six weeks of various aspects and then it had a day of practical with hives, making hives. If I'd been on the course before I'd got the bees then I would have made my own hive, or bought a kit and assembled my own hive. Because I bought a complete package I paid a lot of money for it, with hindsight I could have reduced the cost by say two thirds by buying a kit and assembling it."

Male, less than two years' experience, follow-up interviewee

The semi-structured interviews with beekeepers with two or more years' experience revealed that while most respondents found courses very helpful, others commented on the variability of the skills and knowledge of speakers. These interviewees did not identify any types of speaker or course that were less helpful, but it was felt that the quality of training was dependent on the personality of the trainer. One respondent commented that it was hard for speakers to know at which level to pitch talks as most audiences (particularly at association meetings) had mixed experience.

4.4.4 Future training needs

Some 94% of respondents reported that they would like to attend training, talks or courses in the future. Respondents were subsequently asked what they would like the training, talks or courses to be about, the main responses are outlined below.

- Control of pests and diseases (86%).
- General husbandry techniques (84%).
- Diagnosis of pest and disease problems (82%).
- Preventing colony loss (83%).

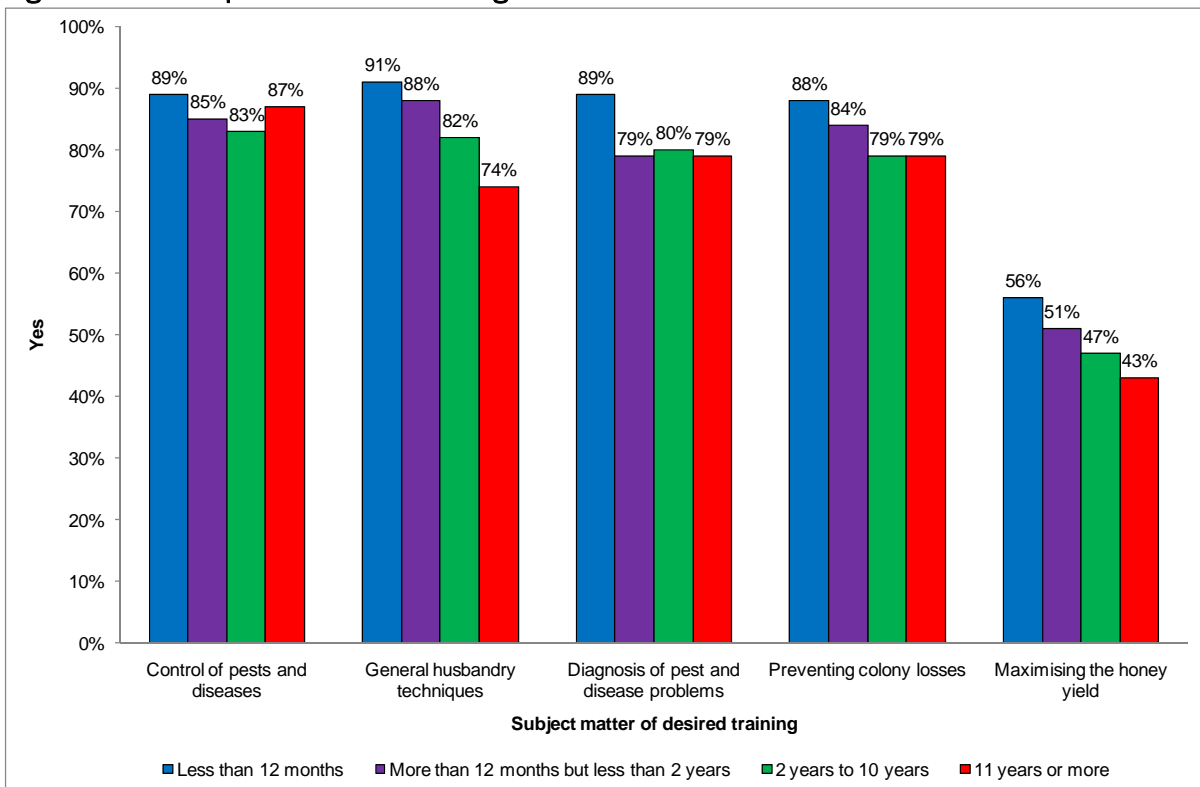
Some of those with two or more years' experience interviewed by telephone were interested in training in queen rearing and microscopy.

We assessed the expressed training interests of the respondents against their experience. Figure 4.4 shows that although there was a strong interest in on-going training across the spectrum of experience, demand for each type of training was strongest amongst those with the least experience. This accords with the findings from the telephone interviews with those with two or more years' experience, which found less interest among that group in attending courses.

In the follow-up interviews, one respondent with less than two years' experience expressed a need for 'middle' level training, between beginner and experienced. Some also said that it would be useful to know the level of knowledge expected by individual courses so that they could better decide whether to attend.



Figure 4.4 Expressed future training needs



Base: All who would like to attending training, courses or talks in the future and responded (852) (Less than 12 months – 272; More than 12 months but less than 2 years – 137; 2 years to 10 years – 261; 11 years or more – 182)

The telephone follow-up interviews with beekeepers with less than two years' experience found that this group felt that there is always something to learn and therefore many were very willing to take part in training in the future.

“Obviously you can always learn more, there’s sort of different aspects of the whole beekeeping scene anyway, from diseases through to marketing and everything, so yeah I’d be interested in gaining more knowledge, yeah.”

Male, less than two years' experience, follow-up interviewee

These follow-up interviews revealed that time pressures were the main barrier to attending training courses and talks.

4.5 Sources of information

4.5.1 Prior to starting beekeeping

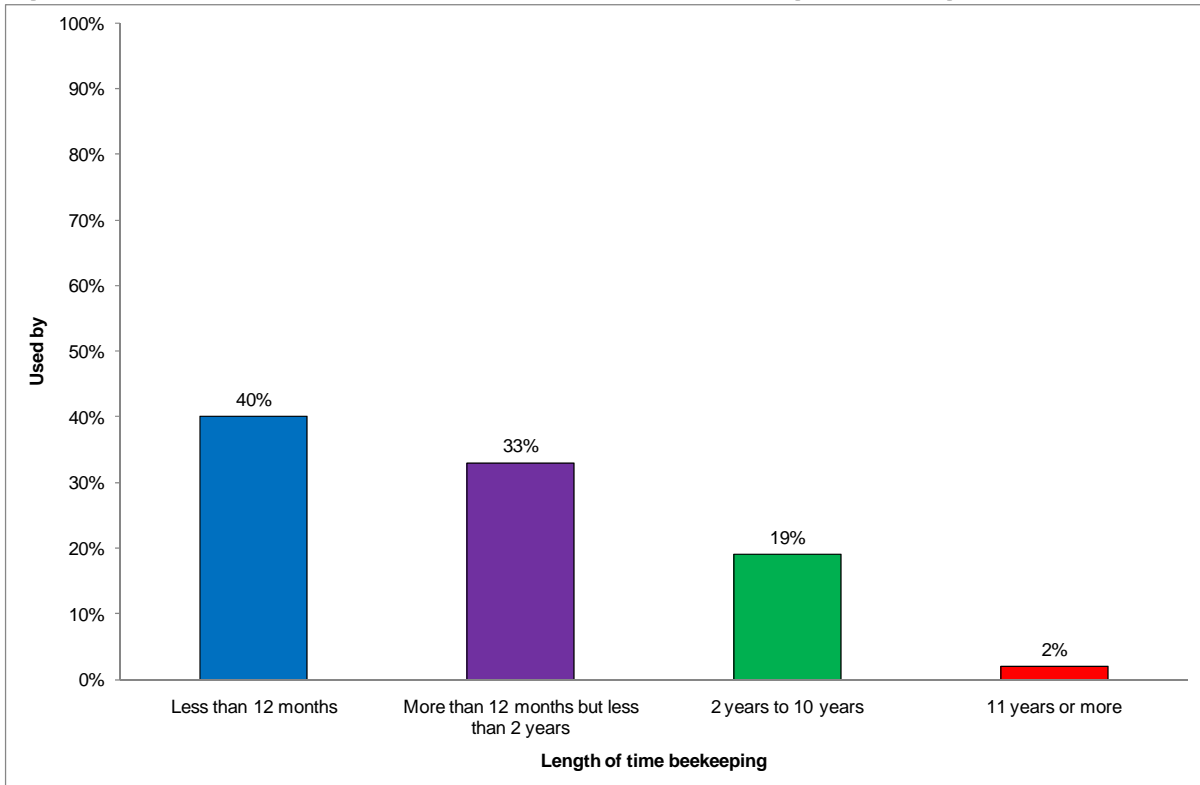
As we have seen already, many beekeepers who have contributed to this study undertook training before getting their own hives and most also sought information about beekeeping from one or more other sources.

Over half of the respondents to the internet survey (57%) obtained information from a beekeeping association before getting bees, 43% of this group used written materials such as books and journals, while a third (33%) got information from a friend or acquaintance and a quarter (24%) used the internet. Many (42%) of the respondents reported that they had used more than one source and only 8% used none of the sources listed. However, very few (2%) used the NBU or BeeBase as an early source of information. Use of the NBU becomes much more prevalent as beekeepers' experience increases as sections 4.5.2 and 4.6 will demonstrate.



These overall figures mask some interesting variations associated with how long individual respondents have been keeping bees. It is no surprise to see the growth of importance of the internet as a source of information for newer beekeepers as shown in figure 4.5. Of those who have been keeping bees for 11 years or more almost none (2%) found information to start beekeeping on the internet, whereas 40% of those who took up the craft in the year prior to completing the survey had used the internet.

Figure 4.5 Use of internet to find information before starting beekeeping



Base: All who responded (905) (Less than 12 months - 278; More than 12 months but less than 2 years - 145; 2 years to 10 years - 274; 11 years or more - 208)

The follow-up telephone interviews with beekeepers with less than two years' experience revealed that some respondents found internet fora were a particularly good starting point for learning about beekeeping.

“From the internet, there was a forum, a beekeepers forum, which I joined and I just asked daft questions, you know... but I also discovered people from all around the world on it... the only thing was, I asked one question and I'd get eight different answers, so you'd have to pick out which one you thought was appropriate, but very, very helpful.”

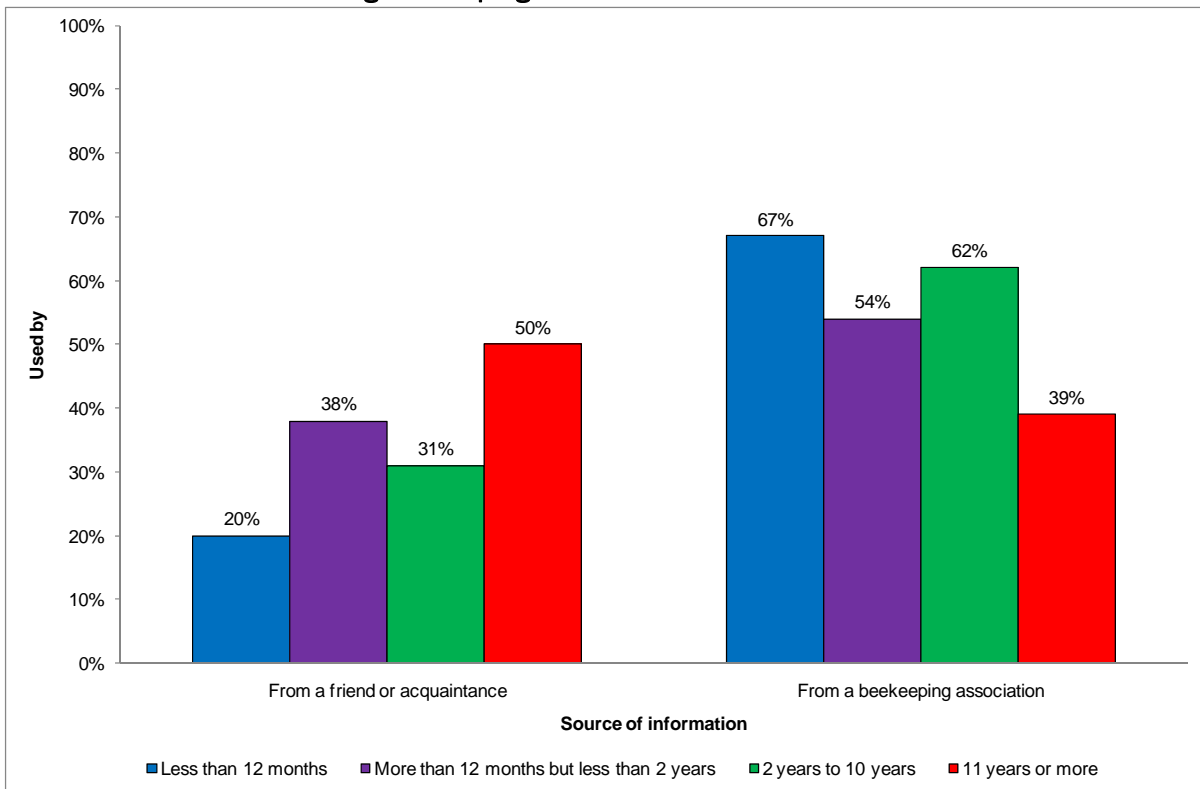
Male, less than two years' experience, follow-up interviewee

However, the internet had not supplanted written material, with 43% of beekeepers citing books, journals or newsletters as sources of information used prior to starting to keep bees, irrespective of the length of time they had been keeping bees.

Other beekeepers were also an important source of information for those starting out, but over time the balance of sources shifted, as shown in figure 4.6. This shows that for those who started more than ten years ago, friends or acquaintances were a more widely used source than beekeeping associations. This situation has reversed for those who started keeping bees in the year prior to the survey.



Figure 4.6 Use of friends and acquaintances and beekeeping associations to find information before starting beekeeping



Base: All who responded (905) (Less than 12 months – 278; More than 12 months but less than 2 years – 145; 2 years to 10 years – 274; 11 years or more – 208)

Follow-up interviews with beekeepers with less than two years' experience outlined the importance of local associations as a source of information for newer beekeepers, as outlined in section 4.2 above.

4.5.2 Current sources of information

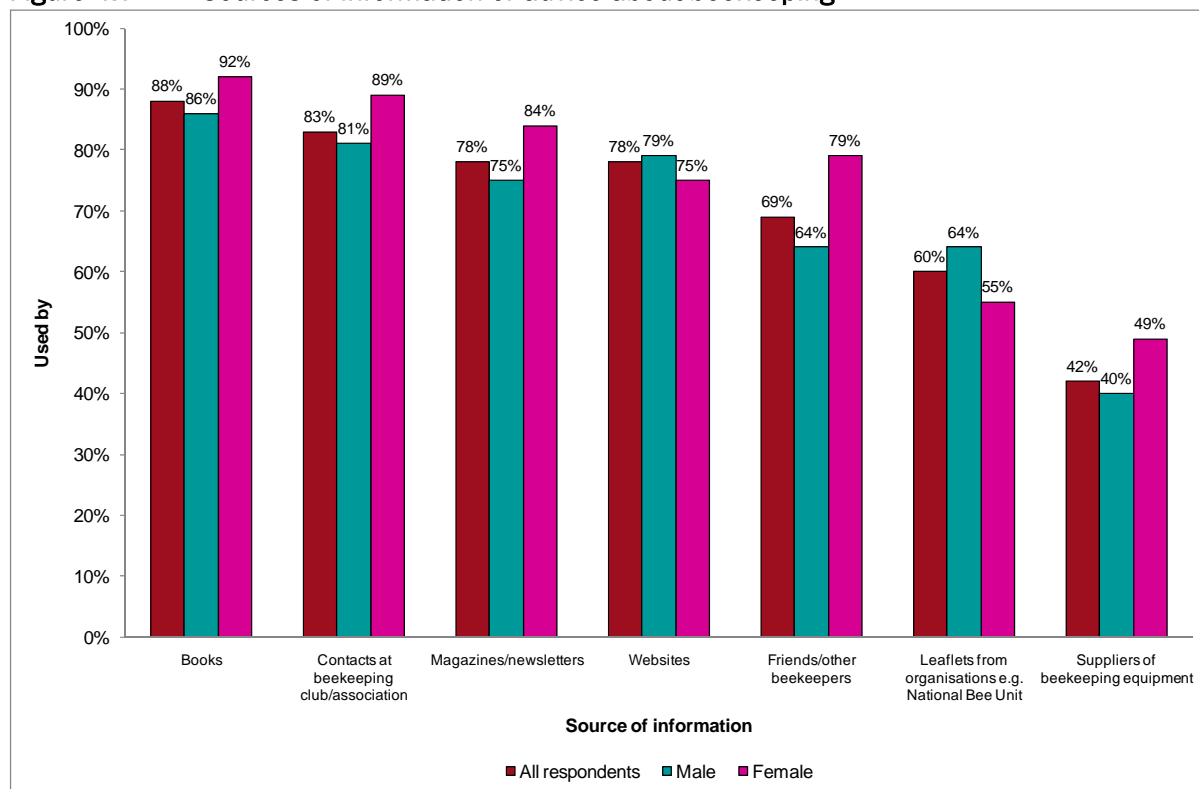
Sections 4.3 and 4.5.1 indicate that beekeepers were quite proactive in seeking information and training prior to starting to keep bees. Additionally, section 4.4 has revealed that the great majority of the internet survey respondents had attended courses or talks since they started beekeeping. This willingness to seek out support is borne out by the range of sources that beekeepers cited as places where they looked for information or advice as shown in figure 4.7.

It is particularly interesting to note that no respondents to the internet survey answered 'Nowhere/do not need information or advice' to the question 'Where do you look for information or advice about beekeeping?' Many of the respondents used multiple sources of information and 81% reported using four or more of the sources listed. Books were the most popular source (88% reported referring to books), closely followed by contacts at a beekeeping club or association (83%), although 69% said friends/other beekeepers. Magazines were as popular as websites – both used by 78%. Leaflets were also fairly popular, with 60% reporting usage. Equipment suppliers were also a fairly important source of information with 42% saying they used suppliers as a source of information or advice. The semi-structured interviews with beekeepers with two or more years' experience also revealed bee inspectors were seen as an important source of information.

Of the seven different types of sources five were more likely to be used by women than men, as shown in figure 4.7.



Figure 4.7 Sources of information or advice about beekeeping

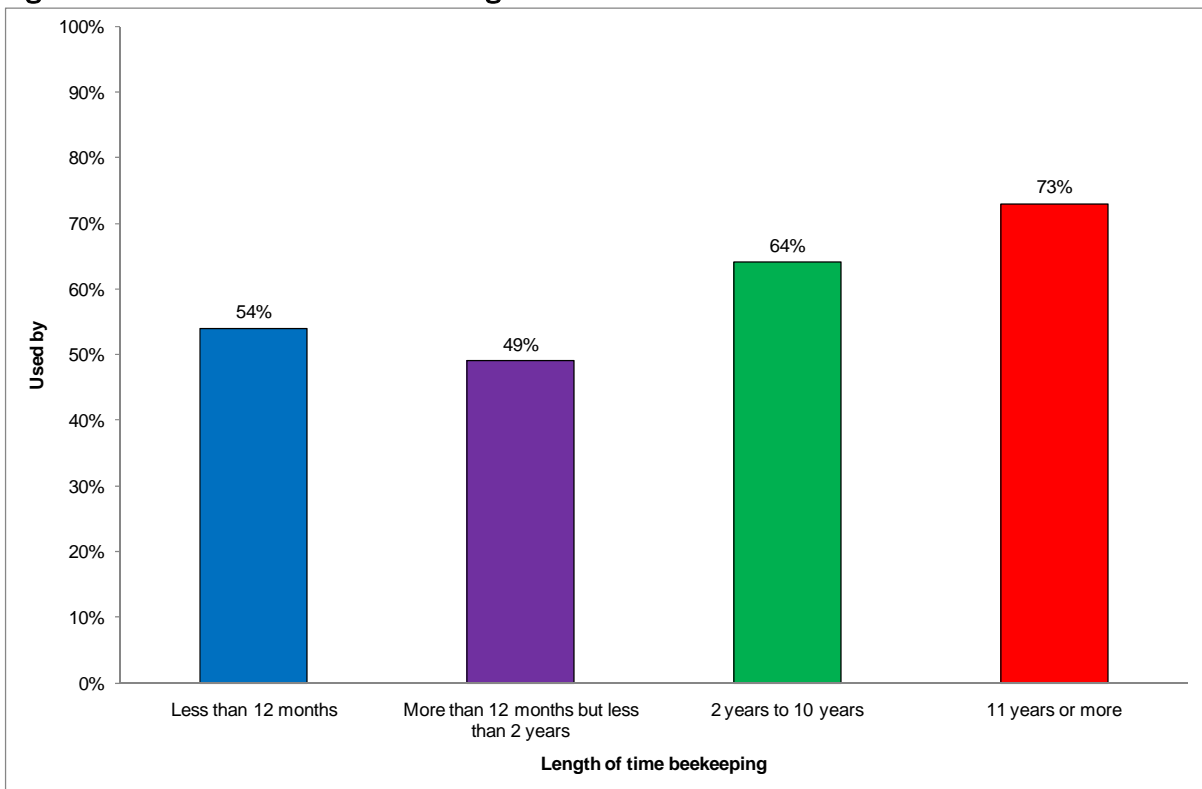


Base: All respondents (906) (Male - 595; Female - 282)

There is one source where the levels of usage changed markedly with the beekeepers' years of experience and this is 'Leaflets from organisations such as the National Bee Unit'. Just over half (54%) of the beekeepers with less than 12 months of experience cited this source, whilst three quarters (73%) of those with 11 years' or more experience cited it.



Figure 4.8 Use of 'Leaflets from organisations such as the National Bee Unit'



Base: All respondents (906) (Less than 12 months - 279; More than 12 months but less than 2 years - 145; 2 years to 10 years - 274; 11 years or more - 208)

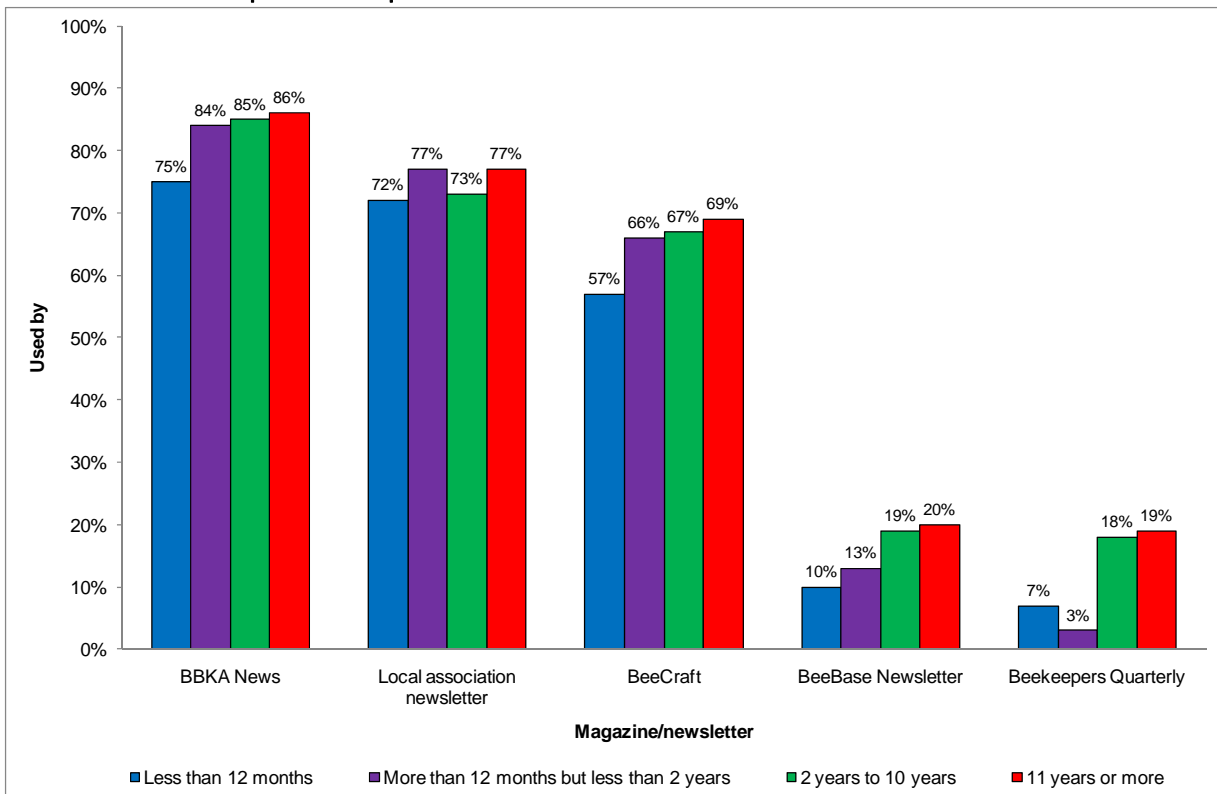
4.5.3 Magazines and newsletters

In the previous section we saw that 78% of the beekeepers who responded to the internet survey sought general information and advice about beekeeping from 'magazines/newsletters'. These respondents were asked which magazines and newsletters they read. Figure 4.9 shows the five most read publications and it is clear that BBKA News (82%), local newsletters (74%), and BeeCraft (64%) are the dominant publications.

Figure 4.9 also shows that the proportion of beekeepers that used BBKA News, local association newsletters and BeeCraft remains fairly constant amongst beekeepers of differing levels of experience.



Figure 4.9 Use of specific magazines and newsletters for information or advice about beekeeping compared to experience



Base: All respondents (all who use magazines or newsletters - 704) (Less than 12 months - 215; More than 12 months but less than 2 years - 103; 2 years to 10 years - 211; 11 years or more - 175)

We also asked respondents to select the 'one most important magazine or newsletter'. Unsurprisingly, given figure 4.9, BBKA News and BeeCraft dominated with 36% and 41% nominating these respectively. The only other source that was nominated as most important by more than 10% of respondents was their local association newsletter, with 17% nominating this.

We asked respondents to say why they found their 'most important' publication useful and there was a distinct difference between the reasons offered for BeeCraft and BBKA News when compared to a local association newsletter. The main reason that the local association newsletter was thought to be important was the regional focus and the associated local nature of the contributors. Two thirds (67%) of respondents offered this reason. A wide range of reasons were cited for the importance of the two national publications, but it is clear that keeping up-to-date with current husbandry advice is important to many. The principal reasons cited for the two publications are shown in table 4.1.



Table 4.1 Reasons for source of information being important

Reason	BeeCraft (%)	BBKA News (%)
Varied topics - comprehensive	23	17
Up-to-date	20	35
Well presented	19	4
Seasonal/topical	14	11
Includes month-by-month guide	13	0
Detailed/technical/scientific	3	11

Bases: BeeCraft (257); BBKA News (226)

As highlighted in table 4.1, findings from the internet survey show that BBKA News and BeeCraft are complementary. They both have some similar strengths but each also has some unique features. In the follow-up interviews with beekeepers with less than two years' experience, interviewees provided illustrative explanations of what they found particularly useful about BeeCraft and BBKA News.

“BeeCraft magazine seems quite interesting because it’s got the beginners article at the beginning of it anyway, so you’re kind of going through a month ahead of what’s kind of happening in the hive, so that’s quite interesting.”

Female, less than two years' experience, follow-up interviewee

“[BBKA News] Practical information really. Seasonal information, and there was recently an article, just as I happened to be thinking about it, it was very timely, very pertinent, there was an item on what percentage of the brood frame to change over a winter period, which happened to be what I was thinking I needed to do.”

Female, less than two years' experience, follow-up interviewee

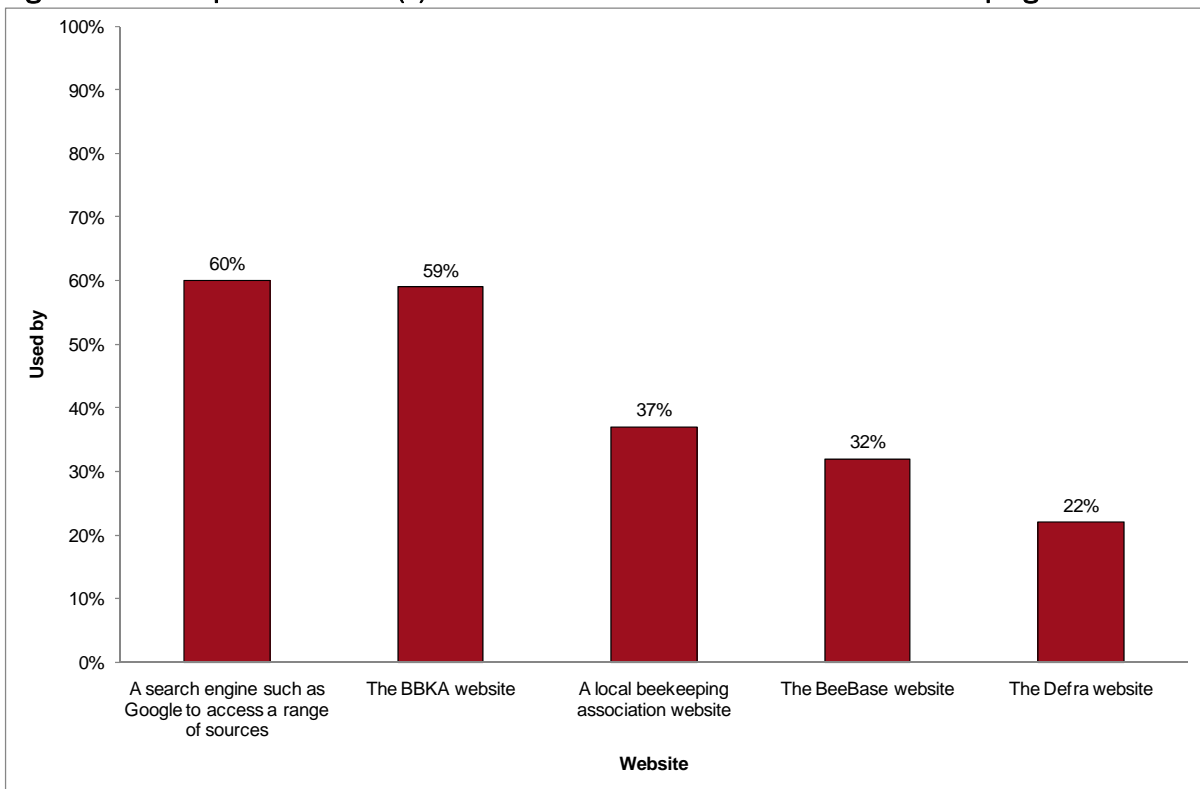
4.5.4 Websites

In section 4.5.2 we saw that 78% of the beekeepers who responded to the internet survey sought information and advice from websites. We asked these respondents which websites they used. Figure 4.10 shows the five most popular responses. The BBKA website was used by 59% and local beekeeping associations' websites by 37%, with the BeeBase website used by 32% and the Defra website used by 22%, but our respondents tended to cast the net widely with 60% using search engines (to access a range of sources) – the single most cited option⁵.

⁵ The Welsh beekeeping association website was also mentioned as an 'other' response.



Figure 4.10 Specific website(s) used for information or advice about beekeeping



Base: All who use websites and responded (702)

Respondents were then asked which of the websites they used for information or advice about beekeeping was the most important for them. Of the 687 who responded, just over a quarter (26%) nominated the BBKA website, but the most popular response (39%) was 'search engines such as Google'. A majority (62%) of those for whom search engines were most important cited 'Access to a wide range of information/sources/opinions' as a reason, and almost a quarter (23%) valued being able to 'see different opinions/theories'. For those who nominated the BBKA website as most important, their main reasons were that it 'contains a wide variety of information' (21%) and that it contains 'up-to-date information' (17%). Semi-structured interviews with beekeepers with two or more years' experience revealed that the BBKA website was used for guides, information (e.g. varroa control), news and events and the forum. While for some the BBKA website was one of a wide variety of information sources used, others highlighted its reliability.

Follow-up interviews with beekeepers with less than two years' experience revealed that search engines (such as Google) were used to search for information about particular questions relating to beekeeping. Interviewees reported discovering numerous different sites, such as other beekeeping associations' websites, to help answer questions; some mentioned "dipping in and out" of various sites. Some interviewees were conscious of the credibility of the sources when evaluating information from Google. For others, the prevalence of non-UK sites, particularly US sites, made using search engines more confusing.

"It's probably a massive source of confusion more than anything else. One of the biggest problems with the Google searches is you tend to get a lot of the American articles."

Male, less than two years' experience, follow-up interviewee

Web fora were also popular but again, can be non-UK focused.

4.5.5 Pests and diseases

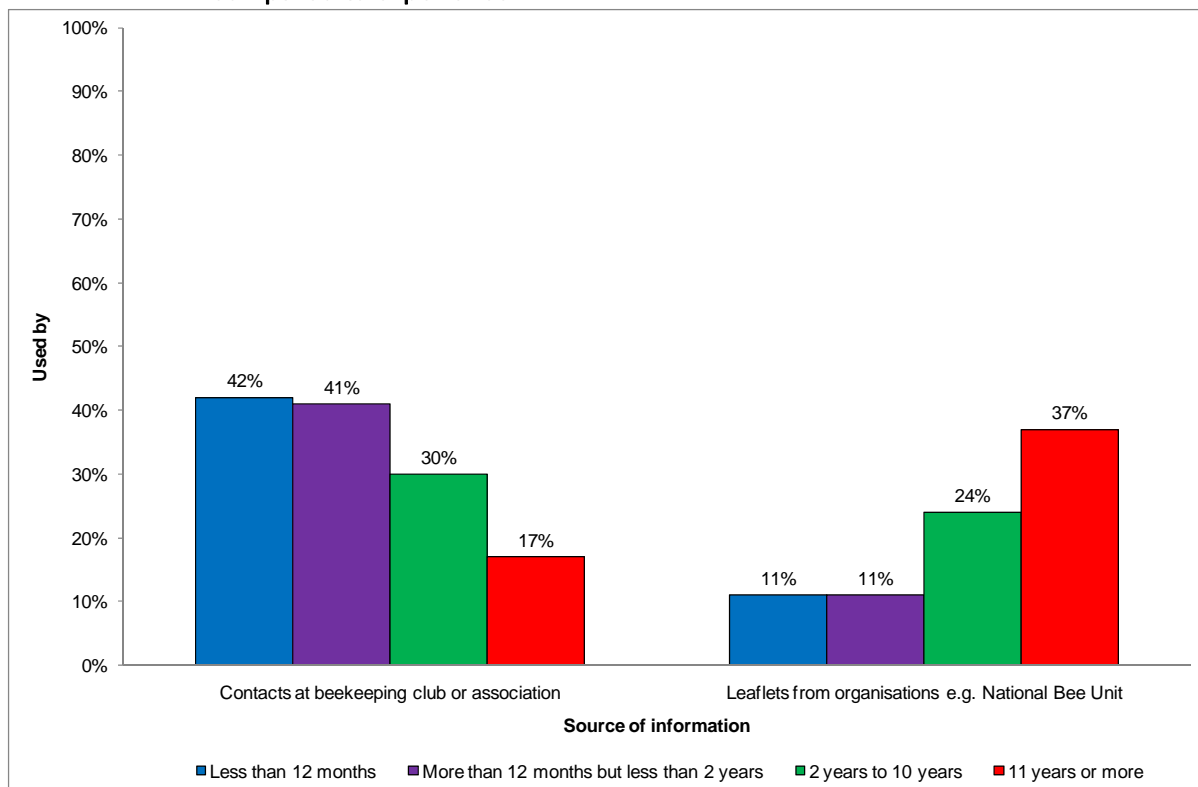
We asked respondents to nominate a source of information that they would be most likely to use for information about treatments for pests and diseases. The four most cited sources were contacts at a



beekeeping club/association (32%), leaflets from organisations such as the NBU (21%), websites (21%) and friends or other beekeepers (11%).

As with some of the preceding questions about information sources, there are trends within these overall figures relating to the experience of beekeepers. Figure 4.11 below shows the relative importance attached to 'Leaflets from organisations such as the National Bee Unit' and 'Contacts at beekeeping club or association' by beekeepers with different levels of experience. This figure shows very clearly that newer beekeepers were more reliant on local contacts (42% of those with less than two years' experience said this compared with 24% of those with two or more years' experience). Those who have been keeping bees for two years or longer placed greater emphasis on leaflets from organisations such as the NBU (29% compared with 11%).

Figure 4.11 Sources most likely to go to for information about treatments for pests and diseases compared to experience



Base: All who responded (898) (Less than 12 months – 276; More than 12 months but less than 2 years – 144; 2 year to 10 years – 271; 11 years or more – 207)

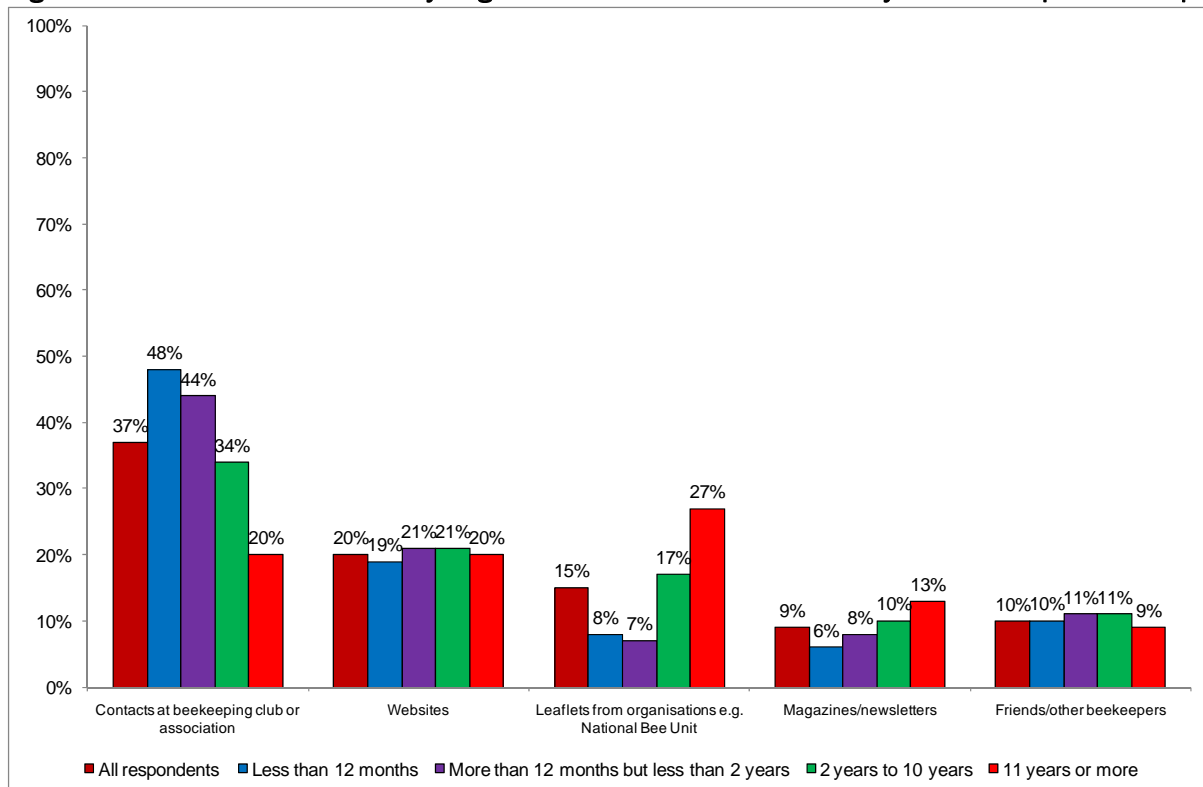
4.5.6 Colony loss

We also asked respondents to nominate the source of information that they would be most likely to use for information about colony loss. The three most cited sources were contacts at a beekeeping club/association (37%), websites (20%) and leaflets from organisations such as the NBU (15%).

Again there are trends within these overall figures relating to the experience of beekeepers. Figure 4.12 below shows relative importance attached to these top five sources by beekeepers with different levels of experience. This figure reinforces the findings in the previous section about the greater reliance that newer beekeepers have on personal contacts, with 47% of beekeepers with less than two years' experience citing contacts at a beekeeping club or association compared with 28% of more experienced beekeepers.



Figure 4.12 Sources most likely to go to for information about colony losses compared to experience



Base: All respondents (888) (Less than 12 months – 271; More than 12 months but less than 2 years – 143; 2 years to 10 years – 269; 11 years or more – 205)

4.6 The NBU

4.6.1 Awareness of the NBU

Awareness of the NBU is very high, in the internet survey only 8% of respondents said that they had not heard of the NBU. The beekeepers who had been keeping bees for less than 12 months were most likely to report that they had not heard of the NBU (13% of this group), with only 3% of those who had been keeping bees for two or more years unaware of the NBU. However, in follow-up telephone interviews with beekeepers with less than two years' experience, some respondents reported limited awareness of the NBU and considered it to be just one of a number of web sources available.

4.6.2 Awareness of and registration on BeeBase

BeeBase has an important role to play in the beekeeping community both as a source of information about husbandry practices and as a database for the bee inspectorate from which beekeepers can access their records. It is therefore surprising that nearly one in four (23%) respondents to the internet survey were not aware of BeeBase, particularly as a majority of respondents to the survey were members of local associations and all had internet access.

Just less than half (45%) of all respondents were aware of BeeBase and had self registered, whilst a third (32%) had not registered or were not sure whether they had registered.⁶

We conducted multivariate analysis to identify the factors most associated with awareness of BeeBase. The most important factors were:

- the number of other beekeepers known; and

⁶ In addition a small number (20 individuals) reported that registration had been done on their behalf by, for example, the bee inspectorate or their local association.

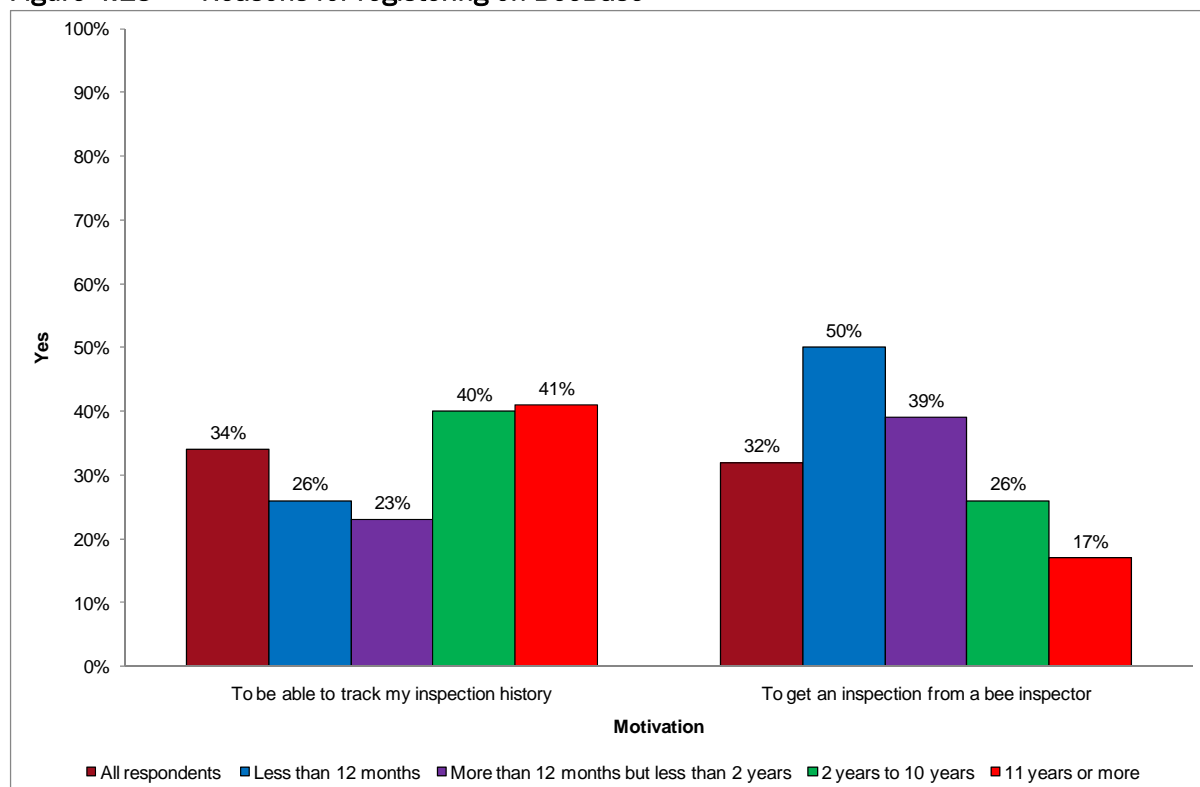


- beekeepers' preferences for written sources of information rather than personal contacts.

A majority (54%) of those who knew fewer than 11 beekeepers and yet preferred personal contacts as a source of information rather than written sources were unaware of BeeBase. Only one in ten (10%) of those who knew 11 or more beekeepers and preferred written sources of information were unaware of BeeBase. This suggests that awareness of BeeBase was heavily influenced by the information channels that beekeepers used. Those who had access to a large number of other beekeepers but who also preferred to use books, magazines, newsletters and websites for information were more likely to become aware of BeeBase. The importance of written sources of information as a factor in promoting awareness suggests that BeeBase may not feature much in discussions between beekeepers, and does not therefore tend to spread much by 'word of mouth'.

The main reason given for registering on BeeBase was to gain 'access to information and advice'. This factor was highlighted by three quarters (74%) of those who had registered themselves. Just under a third cited 'To get an inspection from a bee inspector' (32%) as a reason for registering, with rather more (34%) citing 'To be able to track my inspection history'. These latter reasons showed some variation according to length of experience as shown in figure 4.13 below. The semi-structured interviews with beekeepers with two or more years' experience also revealed that a number of interviewees registered because they thought that all beekeepers should register. Some respondents believed that if more beekeepers were known to the bee inspectorate, disease control measures by the inspectorate would be more effective and the incidence of notifiable disease would reduce.

Figure 4.13 Reasons for registering on BeeBase



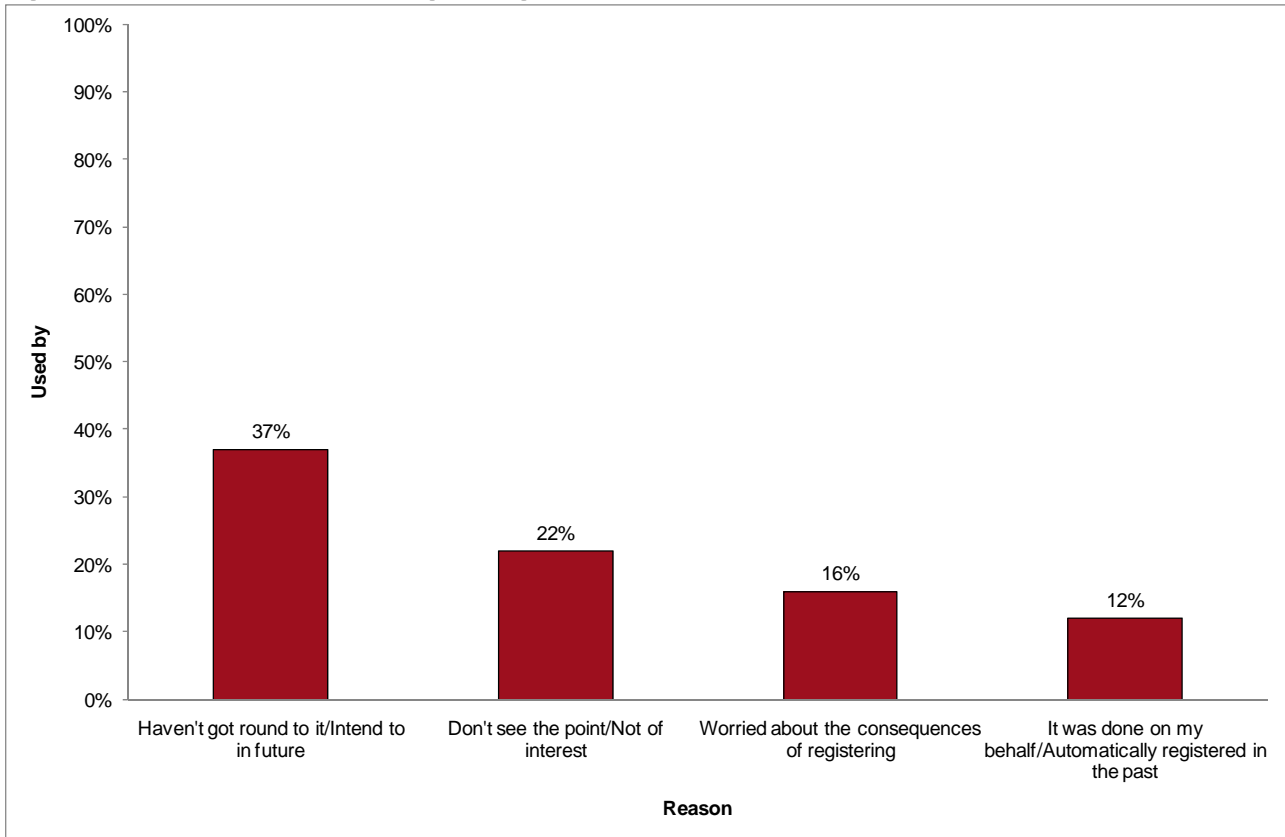
Base: All respondents who registered on BeeBase and responded – 401 (Less than 12 months – 105; More than 12 months but less than 2 years – 61; 2 years to 10 years – 126; 11 years or more – 109)

We also asked those who had not registered themselves on BeeBase why this was the case. The most frequent responses were that the beekeeper had not yet 'got round to it' and that the beekeeper did 'not see the benefit' (37% and 22% respectively). Under a fifth of those who had not registered themselves were concerned about adverse consequences of registering (16%), for example how their personal data might be used. About one in ten (12%) also reported that they had been registered by



somebody else such as the bee inspector. Figure 4.14 shows the four main reasons reported for not registering on BeeBase.

Figure 4.14 Reasons for not registering on BeeBase



Base: All who have not registered on BeeBase and responded (185)

There was some confusion reported among beekeepers with less than and two or more years' experience about the process of registering on BeeBase. Some beekeepers were unsure if they had been automatically registered on BeeBase because they were a member of an association or because they had met the bee inspector.

Some of those who were interviewed by telephone with two or more years' experience who had registered on BeeBase felt that there was no benefit to them personally of doing so. They mentioned that they did not receive information and so there was no reason to promote registration to other beekeepers.

"I thought I would get more out of enrolling on BeeBase than I have."

Female, two or more years' experience, semi-structured interviewee

Limited feedback from BeeBase may be one reason for interviewees' uncertainty as to whether or not they are registered.

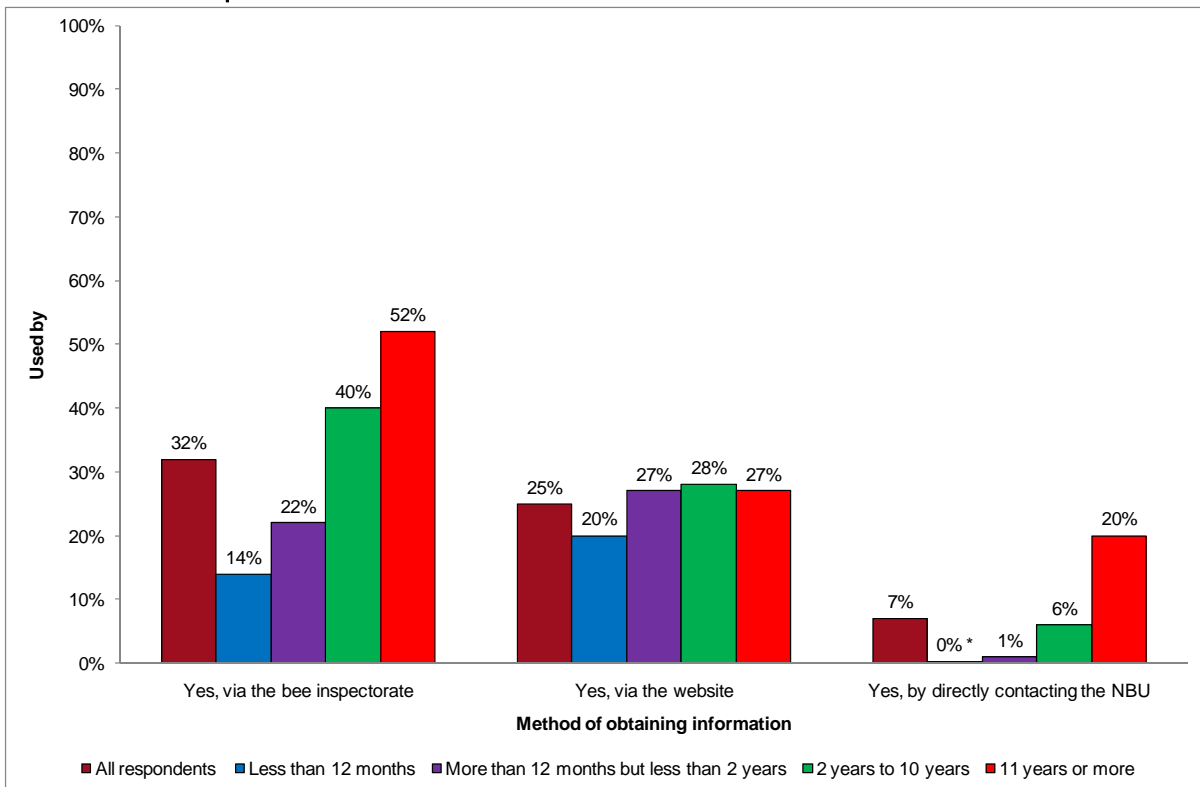
4.6.3 NBU as a source of information

Just under half (47%) of the internet survey respondents had sought information or advice from the NBU, either via the bee inspectorate (32%), the NBU website (25%), or by contacting the NBU directly (7%). A similar number (45%) had heard of the NBU, but had never sought information from the unit.

Beekeepers with longer experience of beekeeping were not only more likely to have heard of the NBU than those who had taken up the craft more recently, they were also more likely to have used all three methods of seeking information from the NBU, as shown in figure 4.15.



Figure 4.15 Methods used to obtain information or advice from the National Bee Unit compared with experience



Base: All respondents (all who responded – 905) (Less than 12 months – 279; More than 12 months but less than 2 years – 145; 2 years to 10 years – 274; 11 years or more – 207)

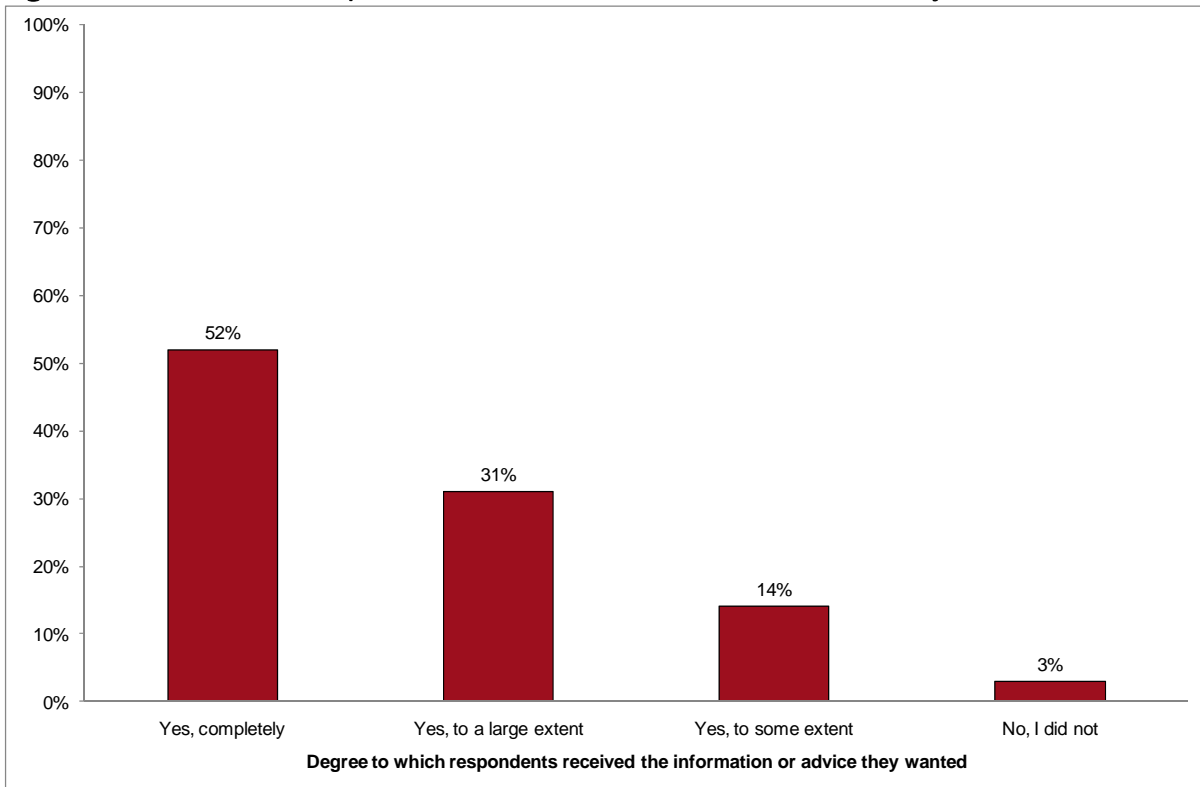
*This was one respondent which was rounded down to 0%.

The most common way to contact the NBU was via the website for respondents under 50 years old, but via the bee inspectorate for respondents aged 50 or over.

The great majority (97%) of the beekeepers who had contacted the NBU had obtained the information or advice they wanted 'to a certain extent', although as shown in figure 4.16 below, only just over half (52%) indicated that they had obtained **all** the information they wanted, while 31% had received the information they wanted 'to a large extent'.



Figure 4.16 Whether respondent obtained the information or advice they wanted from the NBU



Base: All who have sought information from the NBU and responded (427)

The follow-up interviews with beekeepers with less than two years' experience confirmed that the NBU was generally seen as useful, but many commented that it was just one of a number of sources used.

"Yes it was quite useful; it is useful to have another source of information that's available, as I'm always telling the kids at school not to rely on one source of information. It's a balance of all the information."

Male, less than two years' experience, follow-up interviewee

This was confirmed by the semi-structured interviews with beekeepers with two or more years' experience who often commented that they collected as much information as possible. It was therefore hard to quantify the importance of NBU in comparison to other sources. However, the leaflets on pests and diseases were identified as particularly useful, and some interviewees reported that the varroa count model on the website was very useful.

4.6.4 What beekeepers want of the NBU

Those with two or more years' experience were asked whether there was anything they would like the NBU to provide that they do not offer. Responses included greater provision of, or support for, training, especially training for those new to beekeeping. One suggested that this could include the provision of easily accessible training materials, such as presentations. Many interviewees could not think of anything. Some interviewees suggested that registration to the NBU should be compulsory.

Some interviewees emphasised the importance of the NBU's communication role. Interviewees suggested that the NBU should become more active and regularly disseminate information about its activities, including advising on husbandry practices. One respondent commented that the NBU should inform people directly if there is a disease outbreak in the area, as people assumed if they do not hear of an outbreak the area is clear.



Another suggested that the NBU should sponsor more research into pests and diseases and the causes of colony loss and again, should be more active in disseminating the findings and implications of this research.

4.6.5 The bee inspectorate

Just over half of the respondents (55%) had been visited by a bee inspector. It is not surprising that the more experienced beekeepers were more likely to have been visited. A large majority (79%) of respondents with two or more years' experience had been visited, compared with just over a quarter (29%) of those with less than two years' experience. However, over two thirds (65%) of those who had been visited had been last visited within the 12 months prior to completing the questionnaire.

More of the internet respondents in Wales had received a visit compared with respondents in England (84% compared with 52%).

We asked those respondents who had been visited by a bee inspector why they had been visited. Just under half (43%) had directly requested an inspection. Rather more (60%) were visited because the inspector requested a visit. A tenth (10%) attributed the visit to registering on BeeBase⁷. However, a number of the beekeepers with two or more years' experience interviewed by telephone defined bee inspectors among their friends and said they saw them quite often. Moreover, inspectors often attended local meetings.

Almost all of the beekeepers who responded to this survey found that visits by bee inspectors were helpful (83% said 'very helpful' and 15% said 'fairly helpful'). Semi-structured interviews with beekeepers with two or more years' experience highlighted the usefulness of information provided by the bee inspector and a number of interviewees reported that bee inspectors were able to answer questions fully and give useful advice. The beekeepers with less than two years' experience interviewed as part of the telephone follow-up suggested that visits were "reassuring" and helped to confirm information already held.

"Well I suppose to some extent just the practice of going round and looking and saying 'well at the moment you're doing everything right, you know the bees look alright', that was it really, to know that I was doing something right."

Male, less than two years' experience, follow-up interviewee

One respondent suggested that the bee inspector had "debunked all of those myths" that resulted from conflicting information.

However interviews with beekeepers with less than two years' experience suggested that although many of the newer beekeepers were not against being visited by a bee inspector, it was not something that they were planning to actively seek.

"I'm always happy for people to visit my hive, because I'm sure they're experts in their field and I'm sure I would learn something, so I wouldn't mind him at all visiting, but I don't think I would seek for him to visit unless I had a problem."

Female, less than two years' experience, follow-up interviewee

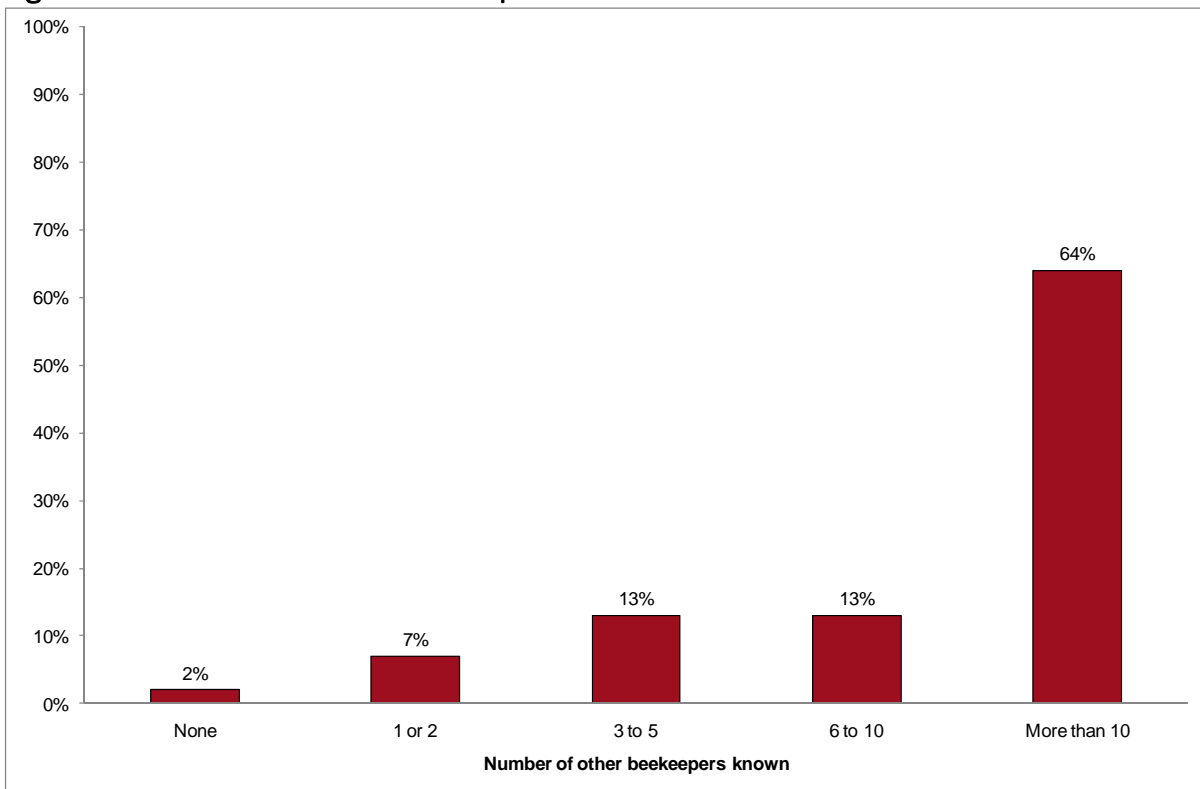
4.7 Informal networks of beekeepers

The beekeepers who responded to this internet survey tended to know reasonable numbers of other beekeepers as shown in figure 4.17. This is not surprising given the high membership levels of beekeeping associations that were reported in section 4.2.

⁷ Respondents were able to attribute visits to more than one cause.



Figure 4.17 Number of other beekeepers known



Base: All who responded (904)

In the semi-structured interviews with beekeepers with two or more years' experience there was a perception that there were some beekeepers around that had been beekeeping for a long period of time and did not feel they needed support or information from others. However, no beekeepers knew any of these people personally.

4.8 Information needs

Several beekeepers with less than two years' experience highlighted a need for information for 'potential' beekeepers, so that people were more aware of the commitment required before starting.

"I think with bees there's this gorgeous idea of keeping bees and getting honey and isn't it lovely for the environment, but maybe what beginner beekeepers... it almost needs to be potential beginner beekeepers, you know, [need is a course] looking at the cost of setting up and what equipment you need, what kind you need, what's involved at different times of the year, and just the pitfalls. It's almost like putting the negative before the positive really so people are really clued in and know that it's not just a case of they'll sit in their box and do their stuff, you have to interact with them to a certain extent."

Male, less than two years' experience, follow-up interviewee

Both beekeepers with two or more years' experience and those with less than two years' experience expressed a need for clearer guidance on the level of experience at which publications are targeted.

"The main thing I've found is trying to differentiate between valuable advice for learners and valuable advice for more experienced beekeepers, that's what I find the greatest difficulty, you spend half an hour reading an article and really it's above your head."

Male, less than two years' experience, follow-up interviewee

Again, both beekeepers with two or more years' experience and those with less than two years' experience suggested that they would be very interested in learning more about the scientific research being conducted in the UK and any possible implications research will have in the future.



4.9 Conclusion

The beekeepers who responded to the internet survey drew on a wide range of sources of information. Many either researched the subject or took part in formal training prior to starting to keep bees. These beekeepers were also keen to keep their knowledge up-to-date. They sought out information and attended courses, talks and training events.

As beekeepers became more experienced they tended to seek information from written sources rather than from other beekeepers. This is mainly because they feel that they have already mined the knowledge of the other beekeepers to whom they have ready access. The beekeepers who took part in this study were concerned about pests and diseases and were keen to keep their knowledge up-to-date.

Nearly one in four (23%) beekeepers who responded to the internet survey were unaware of the NBU website, BeeBase. BeeBase has an important role to play in the beekeeping community both as a source of information about husbandry practice and as a database for the bee inspectorate from which beekeepers can access their records. Raising awareness of BeeBase is therefore important. As would be expected, those who were newer to beekeeping were less likely to be aware of BeeBase. However, length of experience was not the most important factor. The information channels beekeepers have available to them played a more important role in their awareness of BeeBase, in particular:

- the number of other beekeepers known; and
- beekeepers' preferences for written sources of information rather than contacts.

The importance of written sources of information as a factor in promoting awareness suggests that BeeBase may not feature much in discussions between beekeepers, and does not therefore tend to spread much by 'word of mouth'. Even among those who are aware of BeeBase, many have not registered. Telephone interviews with beekeepers revealed that some beekeepers do not associate registration with the NBU with benefits to them, and do not see the point in registering. Others who have registered on BeeBase expressed surprise that they received no further communication from the NBU after registration. Some suggested that an e-mail newsletter may be valuable. Such communication would help to build a sense of 'belonging' to BeeBase, rather than just being registered on a list. To raise awareness, BeeBase should offer the sort of features and information that would encourage beekeepers to talk about BeeBase.



5 Bee farmers

5.1 Introduction

This chapter reports primarily on the 31 respondents to the internet questionnaire who indicated that they were members of the Bee Farmers Association or reported that they had 40 hives or more. It also refers to the responses given by the 20 bee farmers who took part in semi-structured telephone interviews.

5.2 Characteristics of bee farmers in this study

Most of the bee farmers had been keeping bees for 20 years or more, 24 out of 31. Between them these bee farmers had 2082 colonies (one bee farmer refused to answer this question). The number of colonies ranged from 9 to 245, with a mean of 69.

Of the 31 bee farmers, four were female, and only one of the telephone interviewees was female. Two respondents to the internet survey were based in Wales, nine were based in the Eastern region of England and six in the Southern region of England. There was only one respondent who was a bee farmer in the North East, and also only one respondent who was a bee farmer in the Northern region of England.

Just over three quarters were aged between 50 and 69, with 11 aged 50-59 and 11 aged 60-69. Only six were aged under 50. This was similar for the respondents to the telephone interview, with the majority (13 out of 20) falling between 50 and 69, and only four respondents under 50.

About a third regarded themselves as retired. Only those interviewed by telephone were asked their occupation and this group defined themselves as bee farmers.

When asked which radio stations they regularly listened to the most common response given by bee farmers was Radio 4, from 14 of the 31 internet survey respondents and 11 of the 20 telephone interviewees.

5.3 Reasons for beekeeping

Aside of the commercial motivations for keeping bees, other motivations were also explored. Of the 31 respondents to the internet questionnaire, 26 were initially motivated to keep bees out of interest as a hobby. Collecting honey for personal as well as commercial use was also a motivating factor for some. The environmental benefits of bees and/or concern about the declining number of bees were important motivators for only a few of these bee farmers.

5.4 Husbandry practices

Those bee farmers who were interviewed by telephone tended to move their bees during the season; only two of the 20 did not. They also tended to feed their bees; only one of the 20 did not. This group cited changes in the crops grown in their locality or in pesticide use as a reason for changing practices over time and as a reason for moving their hives.

5.4.1 Monitoring

All the bee farmers regularly monitored their bees for pests and diseases. Most did this at least every 10-12 days, only one monitored as infrequently as just once per season.

Twenty-nine bee farmers used visual signs to monitor their bees. The main ways of detecting disease, even for those with very large numbers of hives, were to visually check that the brood was developing and that individual bees were not malformed in any way. Fifteen used the mite drop count method of monitoring. Other methods were used to a lesser extent. Importantly, bee farmers with more than 20 or so hives tended to treat all the hives if they saw disease in just one because they believed that any disease would spread.



5.4.2 Controlling for varroa

All 31 bee farmers who responded to the internet survey controlled for varroa, although as section 5.5 below shows, all admitted to having experienced varroa in their colonies. A variety of methods were used, the most popular being oxalic acid (solution self mix), Apiguard and drone comb removal.

5.5 History and awareness of pests and diseases

All 31 bee farmers who responded to the internet survey had experienced varroa, only three had *not* had chalkbrood, and seven had *not* had Nosema. Eighteen had experienced sacbrood and 11 EFB. All diagnosed the pests and diseases themselves but 14 had also been diagnosed by a bee inspector. In some instances samples were sent off for analysis to confirm diagnoses.

Just over half of bee farmers (from both the internet and telephone surveys) used the shook swarm technique as one of their husbandry methods.

5.6 The future

Bee farmers who took part in semi-structured telephone interviews felt that beekeeping had got harder, mainly because of the increase in disease and the need to be more scientific. They referred to the impact of climate change, which they perceived to be evidenced by a shorter winter season and wetter summers which left bees cold and with less food available.

With regard to the beekeeping community in general, some bee farmers felt that a new breed of better educated amateur was coming in to the craft and that might serve to raise the level of practices. Some bee farmers were concerned about a small number of older beekeepers who, in their opinion, had not changed their practices in line with modern conditions.

Bee farmers were split between those who felt that pests and diseases were now under control and those who feared that the situation would get worse in the future.

5.7 Knowledge of regulation

All 31 bee farmers who responded to the internet survey said that they were aware that some pests and diseases had to be reported to the bee inspectorate. All of the 20 interviewed by telephone knew that AFB was notifiable and all but one knew that EFB should be notified. Fourteen also mentioned that hive beetle had to be reported and nine mentioned that *Tropilaelaps* mites should be reported. However, they were being asked to recall this information spontaneously with no prompts.

When the 20 bee farmers interviewed by telephone were asked whether they were aware of any other legal requirements relating to beekeeping, a mixture of responses related to insurance and food standards for honey were the main things mentioned. Some also mentioned logging products applied to the hives.

5.8 Membership of associations

Only one bee farmer from the internet survey was not a member of some kind of association. Most of those who responded belonged to the Bee Farmers Association. However, 19 of the 31 survey respondents also belonged to local associations affiliated to the BBKA or the WBKA and a few belonged to local associations not affiliated to the BBKA or the WBKA. One telephone respondent explained that he went to the local amateur meetings in an attempt to improve relations between bee farmers and amateur beekeepers. Some reported being involved in training.

Meeting other beekeepers and the provision of information were given as the main reasons for joining associations. Finding out what was going on locally was of value to some bee farmers who were members of local associations.



Most of the bee farmers (26 out of 31) had been to local association meetings, although one telephone interviewee said it was too far away but he valued the information they distributed and a couple replied that they did not have the time to attend.

5.9 Training/courses/talks

Of the 20 bee farmers who were interviewed by telephone about half had been initiated into beekeeping because of family connections or by meeting a beekeeper. A few had learnt about it at school or as part of a horticultural course at college and a couple had worked on bee farms. There was no clear pattern as to whether or not these experiences were considered to be 'training'.

Some bee farmers continued to go to talks, mainly at their local association, with some saying these were delivered by the BBKA or the bee inspectorate. In general these talks were said to be beneficial, especially for keeping up-to-date, but some bee farmers felt that the talks were aimed at amateurs and/or beginners. It was said that talks aimed at amateurs gave advice that bee farmers with dozens of hives could not implement because it would be too time consuming.

The majority of bee farmers in both the internet survey and telephone questionnaire indicated that they were interested in attending more courses. Some were regular conference attendees. There was particular interest in knowing more about research into pests and diseases and the husbandry implications of the findings. There was also interest in keeping up-to-date with what is happening in other countries, especially as there is import and export of bees. The bee farmers were keen to be aware of events outside the UK and the implications for bees in the UK, either in respect of pests and diseases coming into the UK, or treatment or the development of husbandry and treatment methods. There was also an interest in breeding issues.

The topics that bee farmers who responded to the internet survey wanted to learn about through training courses in future were general husbandry techniques (23 respondents), control of pests and diseases (23) and the diagnosis of pest and disease problems (22). Those who didn't want to attend more talks or courses in future felt that they didn't have enough time and/or felt well enough equipped with their existing knowledge.

5.10 Sources of information

Magazines and newsletters, books, and personal contacts were the main sources of information cited by the bee farmers in the internet survey.

For general information about beekeeping, the BBKA News is the favoured source for these bee farmers. BeeCraft and Beekeepers Quarterly were also cited by many. The Bee Farmers Association newsletter and journals from the USA were used by some telephone interviewees.

The bee farmers who were interviewed by telephone were asked for their feedback on the specific sources of information that they used. BeeCraft was seen as providing a good overview and a way of keeping up-to-date. It was thought to be useful for beginners but the bee farmers rated it of limited importance to them. Beekeepers Quarterly was highly valued by those who read it. Its international perspective was particularly of interest, both on information about research findings and about EU funding that might be available. The Bee Farmers Association Bulletin was valued because it has up-to-date information, especially on UK legislation. The Journal of Apiculture Research was of interest to those who wanted to know more about current or recent research. US journals were felt to give a broader perspective and there seems to be an appetite for finding out about experiences and practices outside the UK, although some bee farmers cautioned that due to different climatic and agricultural conditions, US experiences were not directly transferable to the UK.

With respect to the internet, the majority (15 out of 21) of bee farmers who indicated which website(s) they used for information about beekeeping tended to use search engines to find relevant information, although nearly as many (13) reported using the BeeBase website for such information. When asked which website was most important for obtaining information, half of the 20 farmers who responded to



this question preferred to use a search engine such as Google, and six cited the BeeBase website as their preferred source of information. BeeBase was reported to be difficult to navigate by some of the respondents to the telephone questionnaire.

5.11 The NBU

All of the bee farmers were aware that the bee inspectorate is part of the NBU.

5.11.1 Registration on BeeBase

Nineteen of the internet survey respondents had registered themselves on BeeBase. Bee farmers mainly registered so that they could gain access to information or be able to track their inspection history. Two of those who had not registered themselves reported being registered by somebody else on their behalf, such as the bee inspector or their local association.

A few of the telephone respondents were concerned that registering the location of their hives would lead to hives being stolen. However, several were in favour of registration being compulsory.

5.11.2 NBU as a source of information

The majority (25 out of 31) of the bee farmers had used information about beekeeping that they knew came directly from the NBU.

The quality of this information was generally felt to be good and some bee farmers interviewed by telephone reported using the material when delivering training courses to others. However, there was some feeling amongst telephone respondents that more regular up-dating was required and that the NBU could learn from experiences in other countries. There was also some concern that the website was difficult to use.

The bee farmers interviewed by telephone reported that they would like the results of scientific research to be made more easily available with the findings presented in lay language and more testing of treatments with the findings made available to inform their practices. They would also like feedback within a specified period after any tests on their bees or colonies have been completed. They assumed that if they hear nothing, there is nothing to report, but they would like this confirmed. While the reasons for charging for the diagnostic service are understood, it was felt that the basic service should be free to encourage testing.

A few telephone interviewees felt that the NBU should play a role in ensuring that those who take up beekeeping as a hobby understand what is required and receive training. These bee farmers were concerned that bad practices amongst amateurs could have a negative impact on nearby bee farmers' colonies.

Some of these bee farmers stressed that bee farming is a commercial undertaking and is part of the farming sector but they feel that they are treated differently from those farming other livestock. That is that they do not receive subsidies or compensation for losses or destruction costs. However, legislation is moving towards self-insurance rather than Government compensation schemes.

5.11.3 The bee inspectorate

Most bee farmers had been visited by a bee inspector in the 12 months prior to the internet survey. Only one of the bee farmers indicated that they had never been visited by a bee inspector. Reasons for visits given by the telephone respondents included:

- the bee farmer requested a visit;
- the visit was routine;
- there were pests or diseases in nearby colonies; and
- because the bee farmer suspected that they might have a disease.



Most of those who completed the internet survey indicated that they found the bee inspectors' visits helpful. However, the telephone interviews revealed that some thought that the inspector who visited did not have enough experience. Some suggested that inspectors should be fast tracked to master beekeeper status. Some also thought that some inspectors did not give enough information or were not 'open' enough with the bee farmers. One reported an incident that the individual bee farmer felt was not dealt with effectively by the local inspector. In contrast, another reported that the relationship with inspectors had changed and the inspectors now gave the impression of working with the beekeeper, rather than of policing beekeepers.

Some of the telephone respondents expressed concern about the independence of some bee inspectors and felt that they should not, for example, be members of local associations. Some also regretted that the system of county inspectors had been discontinued, which they felt helped to maintain standards and provided training for beekeepers in general.

5.12 Conclusion

Bee farmers were concerned with keeping up-to-date with the latest information about pests and diseases and husbandry techniques. They were likely to act quickly if they found evidence of pests or diseases and to treat all hives to prevent the spread of any infection.

Bee farmers tended to see pests and diseases as a threat to their livelihood because of their commercial interests. Most of those interviewed by telephone were positive about the bee inspectorate and the National Bee Unit, whilst tending to believe that more scientific research that results in treatments offers the best prospect for success in the battle with pests and diseases. Some felt that registration on BeeBase should be compulsory, as the colonies of beekeepers who are unknown to the bee inspectorate are more likely to be a source of disease for other colonies nearby. A minority of bee farmers felt more ambivalent to the NBU, feeling that their livelihood was threatened by standstill orders or colony destructions when cells test positive for disease.

The bee farmers interviewed by telephone tended to have a higher level of knowledge and experience than beekeepers. Two of the 20 interviewed were formerly members of the bee inspectorate, and many bee farmers were committee members of local beekeeping associations, often involved in training newer beekeepers. This suggests that they may have a greater degree of influence on the beekeeping community than their numbers would suggest.



6 Conclusions and Recommendations

This study had four main objectives, which were to enable Defra to have a better understanding of:

- the way that beekeepers decide which husbandry methods to employ, and their experiences of, and attitudes to, these methods;
- how beekeepers' behaviours and practices are influenced by the advice available to them;
- drivers for, and barriers to, new beekeepers adopting good husbandry methods; and
- the most effective ways of influencing beekeepers to adopt better husbandry of their bees.

More than 1000 beekeepers participated in this study through the in-depth interviews and the internet survey. This chapter addresses each of the objectives in turn as a result of this extensive study, and the final section contains our recommendations.

6.1 How do beekeepers decide which husbandry methods to employ, and what are their experiences of, and attitudes to, those methods?

Nearly all of the beekeepers who took part in this study were conscious of the benefits of keeping up-to-date with the latest husbandry advice. This openness to new ideas is striking and counteracts the stereotype. It is driven by a widespread awareness of the threat from the varroa mite in particular and other pests and diseases in general. Those who had more recently taken up beekeeping looked to more experienced beekeepers for advice about which husbandry methods to use. More experienced beekeepers were more likely to express a preference for using written sources of information such as journals, newsletters and websites for advice about issues such as dealing with pests and diseases.

As a group, there is not great support for 'traditional' methods over more modern approaches. However, many beekeepers aspire to not using chemicals, especially those who had taken up beekeeping more recently. This may be because this group has been attracted to beekeeping by publicity surrounding the declining bee population and is more likely to have pro-environmental motivations. The findings suggest that greater experience of dealing with pests and diseases leads beekeepers to use chemicals as a pragmatic control measure, and as this cohort becomes more experienced their attitudes to the use of chemicals may change.

6.2 How are beekeepers' behaviours and practices influenced by the advice available to them?

The beekeepers who responded to the internet survey were hungry for information and drew on a wide range of sources. Many either researched the subject or took part in formal training prior to starting to keep bees. A large majority of those who contributed to this study had joined beekeeping associations as a way of meeting other beekeepers, hearing from experts and gaining access to training. Most beekeepers were keen to keep their knowledge up-to-date, and had attended courses, talks and training events since owning colonies.

One of the main factors that influenced behaviour was the degree of integration into the beekeeping world as measured by:

- the number of contacts with other beekeepers;
- knowledge of BeeBase; and
- the use of written information.

The other important factor that influenced behaviour was the level of experience of the beekeeper both in the length of time they had kept bees and the number of colonies that they managed.

Those who were more experienced and more integrated into the beekeeping world tended to use a wider variety of control and monitoring methods, including more complex bio-technical control methods such as 'shook swarm' technique. They were also more likely to use Integrated Pest Management



(IPM). This seemed to be due to a higher level of technical ability and greater confidence in applying information from written sources and websites, as well as information from other beekeepers.

6.3 What are the drivers for, and barriers to, new beekeepers adopting good husbandry methods?

Beekeepers tend to be well educated and informed, both those new to beekeeping and those more experienced, as judged by the media consumption of the respondents and interviewees. The beekeeping community in England and Wales has increased substantially over recent years as a new cohort of people have been attracted to the craft, possibly spurred on by media publicity about the declining bee population. This educated group of new recruits to beekeeping are very aware of the threats posed by pests and diseases, and they are consequently hungry for information. Awareness of varroa and other threats is the main driver for new beekeepers to adopt good husbandry methods.

The new beekeepers that responded to our study tended to have found their initial information about beekeeping in books, magazines, on the internet and from beekeeping associations, rather than from other friends or family. This new cohort recognises the need for training. However, many experienced beekeepers remarked that introductory courses at their local association were full and people were being turned away, whilst some newer beekeepers reported experiencing difficulty getting a place on courses. This is a barrier to new beekeepers adopting good husbandry methods.

BeeBase has an important role to play in the beekeeping community, both as a source of information about husbandry practices and as a database for the bee inspectorate from which beekeepers can access their records. For new beekeepers it also offers the opportunity to receive an advisory visit from a bee inspector, which is a valuable source of information and advice about dealing with pests and diseases in their colonies. Given this important role and that most of the respondents were members of local associations, it is surprising that many beekeepers (especially those with less experience) were unaware of BeeBase. Being unaware of, and unregistered on, BeeBase may be a barrier to beekeepers receiving information about good husbandry methods such as IPM, and therefore adopting those methods.

The beekeepers we interviewed did not have a strong sense that there was such a thing as 'good practice' in beekeeping. This poses a barrier to beekeepers' understanding of which husbandry methods they should adopt.

6.4 What are the most effective ways of influencing beekeepers to adopt better husbandry of their bees?

Taking into account the conclusions presented in the preceding sections, we recommend that Defra promotes four key courses of action to influence beekeepers in their choice of husbandry practices.

6.4.1 Tailor the message

Defra should promote the dissemination of information about good husbandry practice. To do this effectively, it should recognise that the message may need to be tailored to different types of beekeeper.

Newer, less experienced and less 'integrated' beekeepers looked to more experienced beekeepers for information about pests and diseases. Newer beekeepers were less likely to be comfortable using written information without support from a more experienced beekeeper, especially if it contains a high level of scientific and technical detail. More experienced and integrated beekeepers therefore often played a leadership or mentoring role in their local association, giving advice and training to less experienced beekeepers. These influential beekeepers often welcome information with a high level of scientific and technical detail, and expressed an interest in knowing about the findings from the scientific research programme Defra is pursuing, as well as findings from other research.

Defra should therefore disseminate messages about good husbandry practices by producing information that meets the different needs of these two audiences, and the intended audience for the



information should be clearly indicated to enable people to locate sources appropriate for their level of expertise with ease. A majority of the beekeepers in this study received the BBKA News or BeeCraft, and appropriately targeted articles placed in such publications may offer an effective method of disseminating information about good husbandry to many beekeepers. Even the more experienced beekeepers seemed to have an incomplete knowledge of the legal responsibilities that accompany beekeeping, so this may be an appropriate topic for an accessible guide.

Information should also be provided for those thinking of taking up beekeeping, to ensure that they are aware of the degree of commitment and investment entailed.

6.4.2 Clarify what constitutes 'good practice'

Some beekeepers expressed confusion over what might constitute 'good husbandry practice'. Defra should promote headline messages about good practice, such as the use of IPM to control varroa. The clarification of 'good practice' could be supported by practical aids that can be downloaded from BeeBase and used by beekeepers as part of their day-to-day practice, such as a recording sheet for logging treatments applied to their colonies.

6.4.3 Support introductory training

The large size of the cohort of new beekeepers and their substantial demand for introductory training has led to a shortfall in the supply of training places. Some experienced beekeepers expressed a concern that the quality of training may suffer if inexperienced trainers provide training. Defra should support introductory training by making good quality training materials publically available, including perhaps good quality images and video clips of husbandry techniques. Other potential measures may include encouraging seasonal bee inspectors to provide training courses 'out of season'.

6.4.4 Promote registration on BeeBase

BeeBase could be a valuable tool for disseminating information. Our study has found that BeeBase needs to improve both:

- its awareness among the beekeeping community; and
- its engagement with the beekeeping community.

A surprisingly large number of beekeepers were not aware of BeeBase, even though many were members of local associations and have attended talks and training. This suggests that beekeepers do not talk to one another about BeeBase. We have found that beekeepers used search engines as a preferred way to find information on the internet, but common searches on beekeeping topics do not locate the BeeBase website. Measures such as search engine optimisation or using Google 'AdWords' would help to raise the profile of BeeBase.

Our study has also found that some of those who were aware of BeeBase had not registered because they felt that they would not benefit from registration. Others who have registered expressed surprise that they had not received any electronic communication as a result. BeeBase should take advantage of the demand for information among beekeepers by actively promoting itself as a useful information resource for the beekeeping community, in addition to promoting the benefits of registration to the beekeeping community as a tool for combating disease. This will encourage registration by giving those who are aware of BeeBase a reason to register, and a reason to talk about it to those who may not know of it.

A number of beekeepers were wary of registering on BeeBase because they were concerned about the confidentiality of data they may submit. The data security of BeeBase should be emphasised and the ways data may and may not be used should be made transparent.