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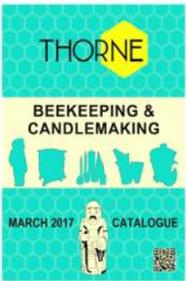
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# THE ESSEX BEEKEEPER



Photo: BBKA

**Monthly Magazine of the Essex Beekeepers' Association**  
**Issue No. 628** **April 2017**

*Furthering the Craft of Beekeeping in Essex*  
Registered Charity number 1031419  
[www.ebka.org](http://www.ebka.org)

## Divisional Meetings Diary dates for April & May 2017

2 April	Sunday 2.00pm	<b>County Event</b>	<b>Ted Hooper Memorial Lecture</b> - Coach House, Marks Hall, Coggeshall CO6 1TG.
6 April	Thursday 7.30pm	<b>Harlow</b>	<b>'Bee Space'</b> - Robert Smith - Kings Church, Red Willow, Harlow CM19 5PA
6 April	Thursday 8.00pm	<b>Romford</b>	<b>'Candlemaking'</b> - Jim McNeill Chadwick Hall, Main Road, Gidea Park RM2 5EL
10 April	Monday 7.30pm	<b>Chelmsford</b>	<b>'Swarm Control'</b> - The Link, Rainsford Road, Chelmsford CM1 2XB
12 April	Wed 7.30pm	<b>Saffron Walden</b>	<b>'Introduction to Queen rearing'</b> - John Rayner. Thaxted Day Centre, Vicarage Lane, Thaxted CM6 2RL
19 April	Wed 6.00pm	<b>Dengie 100 &amp; Maldon</b>	The Oakhouse, High Street, Maldon CM9 5PR
20 April	Thursday 7.30pm	<b>Epping Forest</b>	<b>'Film Night'</b> - Chingford Horticultural Hall
23 April	Sunday 3.00pm	<b>Braintree</b>	<b>Apiary Meeting</b> - Coney Green, Great Bardfield, CM7 4PY
26 April	Wed 7.30pm	<b>Southend</b>	<b>'Swarm Collecting'</b> - Pat Holden + Video <b>'The Ghosts of the Hive'</b> WI Hall, Bellingham Lane, Rayleigh SS6 7ED
27 April	Thursday 7.30pm	<b>Colchester</b>	<b>'Swarm Control – increase or not?'</b> - Langham Community Centre, Church Road, Langham CO
4 May	Thursday 8.00pm	<b>Romford</b>	<b>'Using varroa treatments'</b> - Paul Wiltshire, and <b>'Trial recipes for the Honey Show'</b> - Angela Mandor. Chadwick Hall, Main Road, Gidea Park RM2 5EL
4 May	Thursday 7.30pm	<b>Harlow</b>	tbc
7 May	Sunday	<b>Saffron Walden</b>	Trip to The Hive at Kew Gardens.
15 May	Monday 7.30pm	<b>Chelmsford</b>	<b>'Integrated pest Management'</b> The Link, Rainsford Road, Chelmsford CM1 2XB
20 May	Saturday	<b>Epping Forest</b>	First Outdoor meeting - tbc
24 May	Wed 7.30pm	<b>Southend</b>	<b>'The Essex Top Bar Hive'</b> - Peter Aldridge. WI Hall, Bellingham Lane, Rayleigh SS6 7ED
25 May	Thursday 7.30pm	<b>Colchester</b>	<b>Hints &amp; Tips for Tendring Show</b> — Langham Community Centre, Church Road, Langham CO

### NOTE TO ALL DIVISIONAL SECRETARIES

Please notify Jean by the 4th of each month of your meetings, [Jean Smye - jsmye@sky.com](mailto:Jean.Smye@sky.com)

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### Divisional Contacts:

**Braintree:** Jan French 07725 166 609      **Chelmsford:** James Curtis 07940 757 831  
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**EBKA Education Secretary:** Jane Ridler Old Barn House, 36 Walden Road, Swards End, Saffron Walden, Essex CB10 2LF 01799 218 023 [jane.ridler@uwclub.net](mailto:jane.ridler@uwclub.net)

**EBKA Examinations Secretary:** Pat Allen, 8 Franks Cottages, St Mary's Lane, Upminster, Essex RM14 3NU 01708 220 897 [pat.allen@btconnect.com](mailto:pat.allen@btconnect.com)

### The Essex Beekeeper Magazine:

**Editor:** Jean Smye, email: [jsmye@sky.com](mailto:jsmye@sky.com) tel. 07731 856 361  
**Advertising:** Jean Smye email: [jsmye@sky.com](mailto:jsmye@sky.com) tel. 07731 856 361  
**Mailing Secretary:**

Printed by Streamset, 12 Rose Way, Purdeys Industrial Estate, Rochford, Essex SS4 1LY

**Web site:** Nick Holmes email: [webmaster@essexbeekeepers.com](mailto:webmaster@essexbeekeepers.com)

### Regional Bee Inspectors for EBKA Region:

Epping Forest and Romford Divisions (excluding Brentwood):  
Diane Steele [diane.steele@fera.gsi.gov.uk](mailto:diane.steele@fera.gsi.gov.uk) tel.

All other Divisions:  
Keith Morgan [keith.morgan@fera.gsi.gov.uk](mailto:keith.morgan@fera.gsi.gov.uk) tel. 01485 520 838 or 07919 004 215

to the alarm pheromone. Allow the paint to dry for a few seconds before releasing the queen.

Alternatively, the queen can be picked from the comb, by approaching her from behind. Pick her up by her wings, don't whatever you do, grab her abdomen as that contains those precious ovaries that are so vital to the colony. Once you have her wings firmly between finger and thumb of the right hand (assuming you are right-handed) offer her the ball of the thumb on your left hand. As she grasps this, use the first two fingers of that hand to secure her legs and thorax and place a spot of paint on her thorax as before. In this position, the queen can also be clipped if you wish.

Remove approximately half of the wings, on one side only, with a pair of sharp scissors. Be very careful not to cut off a leg as she may try to use her rear legs to push the scissors away. Many people think this is a method of swarm control – it is not – but it does allow slightly longer between your inspections and will prevent a prime swarm leaving with the old queen. However, they will wait a few more days and leave with a young queen if left to their own devices.

What about colour? You can use the appropriate colour for the year, but personally, I prefer either white or yellow, as these are the two colours that stand out best. My records tell me how old she is.

**AFTER - the Queen and her retinue**  
Photo by Celia Davis



### The vicious colony

A final word about finding queens in vicious colonies. Choose a really nice day when the bees are flying well and first make sure that you are well protected and with the smoker well alight. You will almost certainly need to use a lot more smoke than normal to keep the bees under control as far as possible. If preliminary skirmishes fail to locate the queen, try moving the brood box as far away as you can in the apiary, placing it on a floor and closing it up. Leave the supers, or put an empty box on the original floor. This must be done on a day when the bees are flying. This uses another of my 'Rules' as the flying bees will go back to the original site. After perhaps two hours, the population in the main hive will be depleted and the colony will become more manageable. The queen can then be found using one or other of the original methods. You will probably not want to mark her, but squash her and replace her with something better mannered.

## Finding that elusive Queen .....

[Part 1]

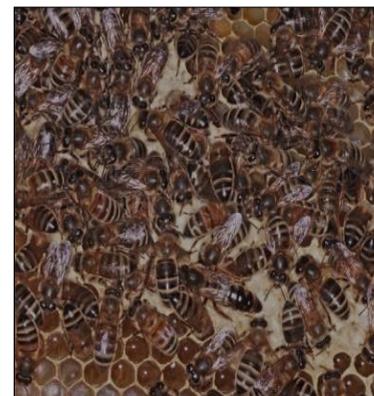
Celia Davis - Warwickshire BKA, via eBees

Finding and marking queens is so fundamental to bee husbandry that I believe it is the single most important thing people can do as a preliminary to many other procedures.

It is true that many beekeepers go through their beekeeping life rarely seeing a queen and that there are ways round most problems, but the advantages are many, not least the ability to spot the queen fairly easily and therefore, being less inclined to leave her out at the side of the hive on a frame, squash her, or accidentally get her in the wrong box. Of course, care must be taken not to damage her while she is being handled, but queens are pretty tough individuals on the whole.

If you have never found a queen, the first fact to grasp is that it is, to some extent a psychological problem. Try to set aside one inspection, aimed solely at finding the queen and approach it with confidence: an 'I will' mind set, rather than an 'I might' one. We will assume, initially, that you wish to find a queen in a normal colony which has overwintered successfully. The time set aside for the job should be on a quiet, warm, sunny day in the early part of the year, before the colony has reached full strength and while the bees are still in a benign frame of mind and haven't become tetchy.

Now to technique: approach quietly and use as little smoke as possible, the



**BEFORE**  
Photo: Celia Davis

aim being to keep the colony working normally and prevent the queen from chasing madly round. Gently remove any supers and the queen excluder and, if there are two boxes comprising the brood area, remove the top one and place on an upturned roof (not on top of a super even with a queen excluder between).

Look to see which box has the most bees and cover the other one with the crown board. Now concentrate on the single box you have earmarked. Remember that, providing you have used little smoke and been very gentle and quiet, the queen SHOULD be in the brood nest

undisturbed, BUT queens can walk anywhere and it is quite possible that she is on the outside frame or the side of the hive, or the floor, so don't make assumptions. With a modicum of luck, she will be occupied with egg laying and surrounded by her retinue. Remove the outside frame, look at it quickly and put it somewhere safe (an empty nuc box is ideal).

Go through the frames one by one using the following technique:

- Lift each one smoothly from the hive and, holding it always over the hive, turn it so that you can see the side that was furthest from you i.e. the side that was darkest (we will call this the dark side).
- Hold it well away from you and look, not for an individual insect, but for something that moves differently or appears in a different configuration. Let your eye move in a systematic way – round the outside of the comb and spiralling inwards to the centre, then glance at the edges of the frame. Queens will often try to get away from the light so will move towards the edge. Reverse the frame and look at the other side in the same way. Then replace it gently against the first frame you looked at. You should try to be really quick as the sooner you get through the combs the better, both for keeping the queen in place and for least disturbance of the colony in general.
- Go through all the combs in this way, remembering always to look at the dark side first and, if you haven't spotted her, come back through them. If you still haven't spotted her, do not go through them again.

If you removed a second box at the beginning of this exercise you need to inspect this but don't put it back on top of the first one. If this has all failed you need to progress to the next stage:

- Take out a few of the outermost frames with no brood on them and put them in your nuc box. Shake the bees off these frames into the hive. Next arrange the frames in tight pairs with spaces between the pairs and leave the box open. (With two boxes you can do both at once.)
- Leave it open to the light for a little time, five or ten minutes should be sufficient. At this point, the help of a companion is really useful. Return to your box and lift out the first pair of frames simultaneously. Quickly look at the dark sides of the combs and replace the pair in the hive. Do the same with each of the other pairs. It is amazing how often this works really well and I have often done it with beginners who spotted their queen themselves as the pair of frames was inspected.

..... *Cont'd on page 13*

## Finding and Marking the Queen ..... [Part 2]

Celia Davis - Warwickshire BKA, via eBees

Assuming that the first two methods have failed miserably and that elusive queen is still running about, probably chuckling, it is time to get really serious. The third method relies on one of those Rules I stated in the March 2017 edition (*page 12*): if you shake or remove every bee in the hive, the queen must be amongst them.

To put this into operation an empty box is required, it may be a brood box or a super, depending on what is to hand, but it must not have any frames in it. The original hive is moved to one side and the empty box placed on the floor. Then all the bees are shaken, or brushed into the empty box and all the frames returned to the original box, now full of frames with brood and food, but with no bees. A queen excluder is placed over the empty box containing the bees and the full brood box is put on top. The hive is closed up and left until the next day.

It is then disassembled, being very careful to remove the top box to one side, keeping it covered, before the queen excluder is moved. This is then removed very carefully and inspected on its lower side. As often as not the queen will be found on the underside of the queen excluder, but she may be elsewhere in the box, so don't jump to conclusions. There will always be a few bees accompanying her. Once marked she can be returned to the upper box which is now put back on its floor. A word of warning: only carry out this manipulation when the nights are warm as brood left in the top box can easily chill.

### Marking the queen

Now to the marking. There are various ways of doing this. Most beekeepers, especially when inexperienced, use the familiar '*crown of thorns*' which presses into the comb, trapping the queen. Take care with this – the prongs of the cage are very sharp and a queen with a hole through her is not very useful. Also, avoid pressing down too hard. Once you have her isolated and in the cage, you can carefully press it so that it holds her in place, then put a spot of paint on her thorax. With modern queen-marking paints this is very easy, but DO press the tip of the pen down on a glove, the hive or somewhere similar to test it so that you do not cover the queen with runny paint. Other paints can also be used. Humbrol works, although it takes longer to dry and is more fiddly and do make sure that it is non-toxic. Use a matchstick or a stiff piece of grass stalk as a 'brush'. Do not use nail varnish as some of them contain chemicals similar

before feeding, an empty drawn shallow super is best added above the deep box in order to give space to store the winter feed given by the beekeeper. Come March of the following year the queen excluder should be inserted between the deep and the shallow, making sure that the queen is in the box below the shallow at this time. If the brood is left to occupy a brood and shallow box it increases the likelihood of the colony swarming, because there are twenty-two frames to inspect for incipient queen cells every ten days if using clipped queens and it also reduces the honey crop to be taken by the beekeeper. A minimum of 3 shallow supers will be required for honey.

**Other hives to consider** are the WBC, the Langstroth, the Dadant, the Commercial and the Smith. The WBC is a doubled walled hive and I have known vermin and swarms to reside in the space between the walls. It is also the most irregular in dimensions, although it is the hive that most non-beekeepers recognise as a beehive.

The others above are larger and therefore heavier and seem heavier still as the beekeeper gets older! I would not use a top bar hive other than as an experiment as any honey has to be cut out and squeezed through muslin to get run honey. Not a system to be recommended.

Do bear in mind that whichever type of hive you decide on do not mix types as that complicates management because components are not generally interchangeable. The National, however, takes the same size supers as the Commercial and this is helpful to know if purchasing second-hand.

Finally, the best timber to use is Western Red Cedar as it lasts a lifetime, does not require paint and thus breathes and helps reduce condensation within the hive. Bees can stand the cold but not damp boxes. No need for quilts as these harbour vermin and other insects.

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## EARS2 PhD Project

### Progress Update

**Emma Bradford**

December 2016

*Any scientific papers which I write during the course of my PhD that are published in peer-reviewed journals will be sent to EARS to be distributed to all associations.*

### Project Background

The European honeybee is a globally economically important pollinator, however in recent years the managed honeybee population has been under intense stress due to the impact of parasites and pathogens. The main parasite of the honeybee is *Varroa destructor*. This parasitic mite negatively affects the health of the bees, mainly by its ability to vector honeybee viruses. The main virus affecting honeybees in the UK is Deformed Wing Virus (DWV). DWV was first identified in honeybees in the 1970s (decades before *Varroa* arrived). *Varroa*'s arrival has been found to change the DWV viral landscape - its strain diversity. In the absence of *Varroa*, bees will have many different strains of DWV but at low levels. However, after *Varroa* has arrived bees have much higher viral loads, of fewer DWV strains. The two main DWV strains are DWVA and DWVB. DWVB is considered more pathogenic to the bees and most associated with *Varroa*. My project intends to help fill some of knowledge gaps that exist about the complex relationship between *Varroa*, DWV and honeybees

### My Project : Investigating DWV replication in Tick cell lines

Tick cell lines have been used in investigations regarding Arboviruses (Arthropod borne viruses) for many years, allowing you look at viral replication within just cells. There are currently no honeybee or *Varroa* cell lines, due to this fact there is very little known about how DWV interacts with cells. I was supplied with pure DWV from a collaborator in Germany, which I then infected the cell lines with. I screened 24 tick cell lines, and found that the DWVB strain (which is most associated with *Varroa*) replicated at low levels in all of the cell lines, whereas the DWVA strain (which is the more classical strain associated with honeybees) only replicated in 3 cell lines at very low levels. Given that *Varroa* and ticks are reasonably closely related, it was not that surprising that DWVB replicated better in the tick cells compared to DWVA. I performed this work at The Pirbright Institute in Surrey for a few months in 2015 in collaboration with a large EU project.

## Designing a new method for DWV quantification

Currently most methods for DWV quantification are very strain specific, resulting in an underestimation of viral load. They also do not consider the impact of strain pathogenicity, with certain strains being more damaging to honeybee health than others. These are important aspects of infection to consider, so I have designed a new assay for looking at DWV viral loads. This new assay allows both strain specific, and total DWV levels to be analysed and will ensure that all aspects of DWV infection can be looked at, giving a more completed view of viral infection. This new assay is a positive reference sample for use in qPCR (quantitative Polymerase Chain Reaction). This positive reference sample is a plasmid containing three distinct sections, with each section being specific to a certain area of the DWV genome. Two of the sections are strain specific: DWVA and DWVB, while the third is a universal section which detects both strains, giving total DWV levels. These three sections have been combined into a single construct which can be used in a dilution series of known amounts to allow quantification of DWV levels within samples.

This new assay was tested using honeybee samples from multiple locations in the UK, including an area which is still *Varroa* free, areas which regularly treat for *Varroa* and an area which does not treat as regularly for *Varroa*. The results showed that bees from areas with no *Varroa* had extremely low viral levels; whereas bees from an area which does treat regularly and therefore has high *Varroa* loads have extremely high viral levels. During this testing period four sets of samples from the EARS area were also tested, one each from Essex, Bedfordshire, Mid-Suffolk, and East-Suffolk. I am currently writing this work up as a manuscript for publication with myself as the first author, with EARS being acknowledged.

## Investigating the potential use of antivirals to reduce viral levels

Antivirals are used in the treatment of viral infection, and they work by inhibiting aspects of viral replication. At the moment there are no completely clean bees without DWV, and once a bee has DWV there is no way to treat them. The ability to treat for DWV infection would be important as it could allow lab based work to be done looking at re-infection, and how the viral diversity changes. While this is extremely important for research, it is not a practical treatment for DWV nor is it designed to help find a cure for DWV. So far I have been looking at 2 antiviral compounds and 3 delivery methods – injecting honeybee pupae, feeding adult bees and soaking *Varroa*. I have been using my new assay for quantifying the viral load in these preliminary investigations. The preliminary results are encouraging indicating that there is an effect. This exciting area of work will be continued.

The previous article and the following one by the late Geoff Mills, have both featured in the *Essex Beekeeper* in the distant past, but are still very relevant

## What Type of Hive ?

Honeybees will adapt to whatever space the beekeeper provides, even a cardboard box, and the choice of hive made by a beekeeper is purely to make management of the bees more suitable to personal requirements. These requirements may be listed as:

- (a) the weight of the hive components
- (b) the management regime and
- (c) whether the hives are going to be moved to crops in flower.

## By far the most popular hive is the National .....

This is a non-standard hive. However, the frames within the brood chamber body are to a B.S (British Standard) 1300. Deep brood frame types are pre-fixed 'DN' in makers' catalogues whereas shallow super frames are pre-fixed 'SN'. Self-spacing deep frames such as the Hoffman (DN4), with a maximum of 11 frames can be accommodated. However, it is preferable to use 10 deep frames and a dummy board as it means that access is then easier to cut through the inevitable brace comb between the frames and the brood chamber body. Since super frames are not examined in normal circumstances, there is no need for a dummy board in the shallow super body. Also there is no need for Hoffman frames in the supers, so avoid this unnecessary expense.

Space super frames (a) by eye, (b) using castellated runners or (c) using plastic ends. Use wide spacers on alternate SN frames to get close spacing. When drawn out and filled with honey some may be removed for extraction and those remaining can then take wide spacers on all frames and the wider spacing makes for later comb proud of the frame so that uncapping becomes easier than on narrow spaced frames where the cappings are sometimes below the level of the woodwork.

The normal DN4 has a 432mm top bar and two 215mm sidebars. The SN shallow has a 432mm top bar and two 140mm sidebars.

Some beekeepers prefer the extra deep brood frame which has 304mm sidebars. This, of course, is much heavier to handle during inspections and for it to be filled full of brood it demands a very prolific laying queen. Otherwise it gets filled up with honey that should be put in the super above - so less for the beekeeper! Good queens can be well catered for in the standard DN4 frames from April through August. From September, and

amongst the worker larvae. This may indicate a poorly mated queen.

5. Ask if this is a purchased queen and, if so, from whom was she purchased? Some beekeepers will make nucs without installing a queen but allow the nuc to raise a queen. A queen raised from a swarm cell or supersedure cell has the potential to produce a quality queen, but queens raised by the insertion of a frame of eggs into a queenless nuc result from "emergency cells", and these cells sometimes produce poor quality queens.

Watch out for stubby queens with short abdomens - this appearance is indicative of poor quality queens.

If the nuc contains a queen raised from a queen cell placed into that nuc, make sure that she has had enough time since emerging to get mated, and that the nuc contains her eggs. I would never buy a nuc containing a virgin queen or a queen cell instead of a mated queen.

While you can learn a lot about a queen from looking at the eggs and larvae (remember that the capped brood in the nuc is probably from the parent colony unless the nuc has been made up for more than a couple of weeks), also notice the queen herself. Her abdomen should be long in relation to her thorax and head.

Ask how long she has been out and laying?

As I said before, she should have been out long enough to be laying eggs and have her own larvae present (this takes only a few days after egg laying begins).

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## DWV strain transmission from *Varroa*

At the University of Aberdeen, we have an artificial feeding system for *Varroa*, which allows us to keep *Varroa* alive in the lab following removal from the hive. I have been using this system to investigate levels of DWV transmission during *Varroa* feeding, using my new assay for viral quantification. This allows us to see how much virus the mites could be injecting into the bees during feeding. The system can also be used to look at potential *Varroa* treatments, antiviral testing, and other investigations into the *Varroa* life. The work on the *Varroa* feeding system is currently being written up, and I am a co-author and with an acknowledgment to EARS.

## Investigating DWV in other pollinators

So far DWV has been found on bumblebees found near honeybee colonies. I am planning on taking this research a step further, and looking to see if DWV is replicating within other pollinators. This is important as if DWV is found to be replicating in other species then it would imply that the virus is spilling over into different host species. I am planning on looking at a range of other pollinators including bumblebees, wasps and several species of solitary bees. I will not only be looking for replicating DWV, but also at which strain of DWV they are infected with. This will give us a valuable insight into potential viral dynamics of DWV in other species.

## Conference attendance

There are two main ways to spread your research to the scientific community: publish research papers and conference attendance. I have presented written posters at three conferences including a Microbiology Society focus meeting on "*Arboviruses and their Vectors*", Glasgow, for which I successfully applied for a £500 travel grant from the society to help towards the costs of my attendance. I also presented talks at two conferences including the International Congress of Entomology (ICE2016) held in Orlando, Florida, USA. I successfully applied for a £550 travel grant from the University to help towards my attendance of this conference. This was an excellent opportunity for me to present my research and meet and hear talks from researchers within the entomological and bee communities.

## EARS Talks

During November I came down to the EARS regions, and gave a series of talks to 4 of the EARS associations. I spoke at the Lincolnshire BKA, Bedfordshire BKA, Ipswich and East Suffolk BKA, and East Suffolk BKA. I really enjoyed the opportunity to meet members of EARS and to be able to tell those who were able to attend about the work I have been doing, and what I plan to continue to do during the rest of my PhD.

## Buying a Nuc' ?

Phil Craft - courtesy of ebees

### **One of the most critical topics at beekeeping courses for prospective beekeepers is "How to get started and where do I get bees?"**

I try to instruct them that a "nuc" (nucleus hive) is usually the best buy for their money when it comes to purchasing bees to get started. A nuc is a new hive started with two to four frames of bees (some of which contain capped brood) and a queen. Think of a nuc as a small starter hive with a laying queen (normally young) and a small number of bees, which can grow into a strong hive in the summer.

Purchasing a nuc is a great way to increase the number of your hives, or to get started in beekeeping. Unfortunately, the demand for nucs is greater than the supply. Prices for nucs are typically slightly higher than for packages, but there are advantages to nucs that make this added cost worthwhile. When you buy a nuc, you are getting a queen that is established and laying (you should see both her eggs and young larvae.). You'll also receive three or four frames covered with bees, along with a couple of frames of capped brood from which new bees are emerging. The queen, which should be a new young queen, will have already been accepted by the bees in the nuc, so there is virtually no danger of rejection, as sometimes occurs with new packages. The queen should also have been laying eggs long enough that the beekeeper that made up the nuc can be confident of her quality. Sometimes with a package (fortunately not very often), the beekeeper discovers that his new queen was insufficiently mated, the queen dies in the cage, or the bees don't accept her. These problems are avoided with a nuc. Plus the bees do not go through the stress of travelling in a package several hundred miles. Many beekeepers recommend that new beekeepers buy only nucs, though, because of the low supply, this is not always possible.

#### **Pitfalls of buying nucs**

Unfortunately, I have seen nucs purchased by beekeepers in the past that were not a good value for the purchaser. It can be difficult for beekeepers just getting started to evaluate nucs.

Recommendations from experienced beekeepers that you trust can go a long way.

Here are some standards that you should expect and questions you should ask the beekeeper from whom you are buying nucs. These questions can also help you compare nucs that are being offered for sale at different prices by different beekeepers.

1. When you first talk to a beekeeper selling nucs, ask how long he has been keeping bees. Occasionally beekeepers with only a couple of years of experience decide that selling nucs is a fast way to make some money. I would be concerned about buying nucs from beekeepers with less than three years of experience.

Don't be shy about asking other beekeepers about the experience and skill level of the beekeeper offering the nuc. You will be looking for disease and pest-free nucs, so they need to come from skilled beekeepers who are proficient at keeping their bees alive.

2. Ask when the beekeeper treated his hives for Varroa mites, or what his Varroa levels were like this spring. If he says he does not treat for Varroa, make sure he is checking the hives for Varroa levels. Ask if his hives have had American Foulbrood. There have been cases of nucs being sold infected with Foulbrood. Did the brood come from his own hives? Some beekeepers buy brood and bees from other beekeepers to make nucs for sale. There is nothing wrong with this, but you should know where the brood and bees came from. Will he guarantee that the hive is disease and pest free and guarantee the queen for at least a brief period of time?

3. Take a veil and ask the beekeeper to open the nuc. The hive should contain at least three drawn combs and may contain one or two sheets of foundation. If the bees are drawing out the new foundation, this indicates that they have been in the nuc more than a few days - which is a positive. If they have not drawn out the new foundation, that is an indication that the nuc was made up more recently.

Look at the drawn comb. Does it look fresh? While it likely will not be newly drawn comb, it should not be more than 2-3 years old. The beekeeper should not be culling his old comb to make nucs. Very old comb can harbour disease (a downside of buying nucs). If you're not sure how to evaluate what you will see in the nuc, get a more experienced beekeeper friend to go with you to check it out.

4. If the nuc has been made up for more than a week, you should have an opportunity to see large areas of eggs or fresh larvae, which is another plus. Look at the new eggs uncapped brood on the comb. Is the queen laying in most of the available cells? If the larvae development is further along, watch out for drone cells scattered in