

THE ESSEX BEEKEEPER



Queen returning with mating sign
Photo taken by Peter Edwards, Stratford-upon-Avon & District BKA

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Essex Beekeeper's Association

The Essex Beekeepers' Association is a registered charity whose object is to further the craft of beekeeping in Essex.

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June 2009

- 4 June* *Thursday 8.00pm* **Harlow** The King's Church, Red Willow, Katherines Estate, Harlow. Mr. J. McNeil on the subject of processing honey.
- 5 June* *Friday 7.00pm* **Romford** at Eastbrookend. Bee Garden.
- 7 June* *Sunday TBA* **Braintree** The Apiary, Coney Green Gt. Bardfield. Queen-rearing Part 2. Telephone Pat Rowland 01376 326036.
- 7 June* *Sunday 2.30pm* **Saffron Walden** Gunsmead, Gt Easton, CM6 2HD. Apiary Meeting—Queen rearing Part 2 with Robert Pickford.
- 13 June* *Saturday 3.00pm* **Epping Forest** Willow Cottage. Due to the kind invitation of Christine Williams we are having our annual meeting at Willow Cottage. Clive de Bruyn is coming to talk to us. The final subject of his talk is to be confirmed but we are hoping it will be on forage and pollination.
- 13 June* *Saturday* **Maldon & DH** we will join the regional bee inspector and our divisional disease liaison officer to visit a number of apiaries. Please contact Jean for details. Tel: 07731856361.
- 14 June* *Sunday TBA* **Romford** Eastbrookend. Divisional Stand.
- 21 June* *Sunday 2.30pm* **Colchester** An afternoon inspecting bees and a walk round the wildflower meadow at Daws Hall, Lamarsh, Bures CO8 5EX by kind invitation from Iain Grahame. To book phone Iain Grahame 01787 269213.
- 24 June* *Wednesday 7.30pm* **Saffron Walden** at Great Easton Primary School—Lecture—Preparing Honey for Showing with Jim McNeil, Romford Division (winner of most awards at the last EBKA Honey Show). Members from other Divisions warmly welcomed!
- 24 June* *Wednesday 7.30pm* **Southend** W.I. Rayleigh. A talk by Terry Clare, 'Is there a best bee?' Terry Clare is President of BIBBA (Bee Improvement and Bee Breeders Association); his talk will be of great interest to all beekeepers concerned with the characteristics of their bees and colonies.
- 27 June* *Saturday* **Chelmsford** Starting around 10 am, we will join the regional bee inspector and our divisional disease liaison officer to visit a number of apiaries in and around the Chelmsford area. If you wish to have your hives examined or would like to join us, please contact Jean for details. Tel: 07731856361.

July 2009

- 2 July* *Thursday 8.00pm* **Harlow** King's Church Red Willow. Plan for re-queening with Mr T Thrussell.
- 3 July* *Friday 8.00pm* **Romford** TBA Barry Wright
- 4 July* *Saturday 3.00pm* **Epping Forest** This is an apiary meeting to be held at Barbara and Peter Dalby's apiary. This session will be suitable for beginners and more advanced beekeepers as a variety of activities will be take place to suit everyone.
- 11 July* *Saturday, All day* **Colchester** Tendring Show. Volunteers needed, please contact Penny Barker 01255 830713.
- 11 July* *Saturday afternoon* **Saffron Walden** at Jane and Richard Ridler's home, Rundle House, Hatfield Broad Oak, CM22 7HE . Annual Barbeque and Apiary meting.
- 18 July* *Saturday* **Dengie Hundred and Maldon** Southminster Flower Show. Help needed to man the marquee
- 18 July* *Saturday 3.00pm* **Romford** at Pat Allen's home Members BBQ. This is an informal social occasion but it is also a great opportunity to get your questions answered and to learn about the honey extraction process. Contact Pat to book and for directions (01708 220897, pat.allen@btconnect.com). Latest date for booking is Wednesday 15th July.
- 20 July* *Monday 7.30pm* **Chelmsford** Link Hall Rainsford Rd. CM1 2XB. An introduction to Queen rearing. Come along and find out which method work best for the experts. Various tools and techniques will be discussed which will set you on the right path.
- 22 July* *Wednesday 7.30pm* **Southend** Bellingham Lane, Rayleigh. Open forum: what is in your toolbox?
- 25 July* *Saturday* **Dengie Hundred and Maldon** Tillingham Flower Show. Help needed to man the marquee
- 25 July* *Saturday* **Colchester** Aldham Apiary. All day meeting with Andy Wattam, Regional Bee Inspector. See advert in magazine.
- 26 July* *Sunday 3.00pm* **Braintree** An Apiary meeting. Telephone Pat Rowland for details, 01376 326036.
- 31 July* *Friday 7.30pm* **Colchester** Rowan Cottage Tendring. BBQ Phone Penny Barker to book 01255 830713.

So what is so special about Manuka Honey? by Howard Gilbert

Over the next few issues I will be assessing what makes Manuka honey a specialist honey which has led it to be sold at significantly higher prices than local honey. The catch-all phrase used is that this honey is 'active'. As I will explain, all honey is active but Manuka honey is active in a unique way. Active honey refers to its antibacterial/antimicrobial activity (there is a difference but the distinction is of limited importance to this article). The University of Waikato in New Zealand has provided a very good summary of the sources of antibacterial activity found in honey. I have borrowed freely from its web page. (see below for web address)

Explanation of Antibacterial Activity

1 Osmotic effect

Honey is a saturated or super-saturated solution of sugars, 84% being a mixture of fructose and glucose. The water content is usually only 15-21% by weight. The strong interaction of these sugar molecules with water molecules leaves very few of the water molecules available for microorganisms. This "free" water is what is measured as the water activity (a_w): mean values for honey have been reported from 0.562 to 0.62. Although some yeasts can live in honeys that have a high water content, causing spoilage of the honey, the a_w of ripened honey is too low to support the growth of any species, no fermentation occurring if the water content is below 17.1%. Many species of bacteria have their growth completely inhibited if the a_w is in the range 0.94-0.99. These values correspond to solutions of a typical honey of concentrations from 12% down to 2%. On the other hand, some species have their maximum rate of growth when the a_w is 0.99, so inhibition by the osmotic (water-withdrawing) effect of dilute solutions of honey depends on the species of bacteria under consideration.

2 Acidity

Honey is characteristically quite acidic, its pH being between 3.2 and 4.5, which is low enough to be inhibitory to many animal pathogens. The optimum pH for growth of these species normally falls between 7.2 and 7.4. The minimum pH values for growth of some common wound-infecting species is: *Escherichia coli*, 4.3; *Salmonella sp.*, 4.0; *Pseudomonas aeruginosa*, 4.4; *Streptococcus pyogenes*, 4.5. Thus in undiluted honey the acidity is a significant antibacterial factor. But if honey is diluted, especially by body fluids which are well buffered, the pH will not be so low and the acidity of honey may not be an effective inhibitor of many species of bacteria.

3 Hydrogen Peroxide

The major antibacterial activity in honey has been found to be due to hydrogen peroxide produced enzymically in the honey. The glucose oxidase enzyme is secreted from the hypopharyngeal gland of the bee into the nectar to assist in the formation of honey from the nectar.

The hydrogen peroxide and acidity produced by the reaction:

glucose + H₂O + O₂ --> gluconic acid + H₂O₂

serve to preserve the honey. The hydrogen peroxide produced would be of effect as a sterilising agent only during the ripening of honey. Full-strength honey has a negligible level of hydrogen peroxide because this substance is short-lived in the presence of the transition metal ions and ascorbic acid in honey which catalyse its decomposition to oxygen and water. The enzyme has been found to be practically inactive in full-strength honey, it giving rise to hydrogen peroxide only when the honey is diluted. This is because the acidity produced in the action of the enzyme drops the pH to a point which is too low for the enzyme to work any more. On dilution of honey the activity increases by a factor of 2,500 - 50,000, thus giving a "slow-release" antiseptic at a level which is antibacterial but not tissue-damaging.

4 Phytochemical Factors (phytochemical factors refers to factors which are derived from a quality of, in this case, plant nectar. It is possible that the phytochemicals themselves are without antibacterial activity until acted upon by enzymes from the bee.)

The evidence for the existence of other antibacterial factors is mainly that the peroxide-generating system does not account for all of the observed antibacterial activity, but there have also been some reports of isolation of antibacterial substances from honey that are not hydrogen peroxide. Although the stability of the enzyme varies in different honeys, there have been reports of honeys with stability well in excess of this variation, showing that there must be an additional antibacterial factor involved. The most direct evidence for the existence of non-peroxide antibacterial factors in honey is seen in the reports of activity persisting in honeys treated with catalase to remove the hydrogen peroxide activity. Several chemicals with antibacterial activity have been identified in honey by various researchers: pinoembrin, terpenes, benzyl alcohol, 3,5-dimethoxy-4-hydroxybenzoic acid (syringic acid), methyl 3,5-dimethoxy-4-hydroxybenzoate (methyl syringate), 3,4,5-trimethoxybenzoic acid, 2-hydroxy-3-phenylpropionic acid, 2-hydroxybenzoic acid and 1,4-dihydroxybenzene. However, the quantities of these present were far too low to account for any significant amount of activity.

Variation in Antibacterial Activity

In almost all reports on the medical use of honey as an antibacterial agent no consideration is given to the selection of type of honey for therapeutic use. Aristotle, c.350 B.C. 6, and Dioscorides, c.50 A.D. 7, recommended that honey collected in specific regions and seasons (and therefore presumably from different floral sources) be used for the treatment of particular ailments, but in modern medicine clinical practitioners have not heeded these views nor the laboratory findings of large differences in the antibacterial potency of different honeys. It was recognised more than 40 years ago that there are differences in the antibacterial activity of different honeys, and a method was devised to determine the "inhibine number" of honeys as a measure of their antibacterial activity. The "inhibine number" is the degree of dilution to which a honey will retain its antibacterial activity, representing sequential dilutions of honey in steps of 5% from 25% to 5%.

The major variations seen in overall antibacterial activity are due to variation in the level of hydrogen peroxide that arises in honey, and in some cases to the level of non-peroxide factors. Hydrogen peroxide can be destroyed by components of honey: it can be degraded by reaction with ascorbic acid and metal ions, and by the action of the enzyme catalase which comes from the pollen and nectar of certain plants, more from the nectar. Also, very large differences have been found between honeys from different floral sources in the thermal stability of their glucose oxidase content, and in the sensitivity of this hydrogen peroxide-producing enzyme to denaturation by light because of a photosensitizing component that comes from some floral sources.

It appears that the honey from certain plants has better antibacterial activity than that from others. However, honeys from some sources have been studied in large enough numbers or have been included in enough different studies for some trends to be noted. Honeydew honey from the conifer forests of the mountainous regions of central Europe has been found to have particularly high antibacterial activity. Also honey from manuka (*Leptospermum scoparium*) in New Zealand has been found to have a high activity, about half of this type of honey having an exceptionally high level of non-peroxide activity.

Thus it is important that when honey is to be used as an antimicrobial agent it is selected from honeys that have been assayed in the laboratory for antimicrobial activity. It is also important that honey for use as an antimicrobial agent be stored at low temperature and not exposed to light, so that none of the glucose oxidase activity is lost. Although all honey will stop the growth of bacteria because of its high sugar content, when the sugars are diluted by body fluids this antibacterial action is lost. The additional antibacterial components then become important.

Next month I will look at how the non-peroxide activity in honey is isolated and how it is measured. Also, I will look at how manuka honey gains its 'Unique Manuka Factor' UMF®.

<http://bio.waikato.ac.nz/honey/>

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Sniffer Bee Technology at Braintree A Report by Nobby Clark

Those who did not manage to attend the meeting at the Tabor Science College in Braintree on Friday, 24 April, missed an interesting talk. It was given by Mathilde Briens, who is the Research and Development Manager of Inscentinel Ltd., a private company based at Rothamsted Research in Hertfordshire. Mathilde is an environmental scientist and grew up in an amateur beekeeping family in Normandy. She worked in a bee research lab. in France collaborating with Rothamsted Research. From this came the idea of using honeybees as sniffer bees and Inscentinel Ltd was set up in 2003.

Sniffer bees are used in much the same way as sniffer dogs except that their training takes less than one hour. They are trained by the *Pavlovian principles of conditioned reflexes. The bees are given a taste of sugar at the same time as being exposed to the scent that is to be detected, whether it be explosives, drugs, money, moulds in foodstuffs and now even dry rot in woods is being detected. The bees are given five lots of training each lasting five minutes and then they are ready for use. In the prototype equipment three conditioned bees were put in cages in a box with their heads projecting into a tube through which the air from the object being tested would pass. An infra-red camera was fitted to the box which would detect the bees' tongues coming out if the scent to which they had been conditioned was present. This would be picked up by the software on a computer. The bees are used for only two days after which they are returned to their hive, after being marked so that they would not be used again.

Bees can be conditioned to more than one scent but a recent development is equipment which will, house 36 bees in six groups of six so that each group can be trained on a different scent or scents. Instead of an infra-red camera a beam of light is now being used and the breaking of the beam by tongues can be detected.

I should add that an advantage of using sniffer bees is that because of the short training/conditioning time operators do not have to take bees with them and can use local sources thus overcoming any import restrictions in other countries.

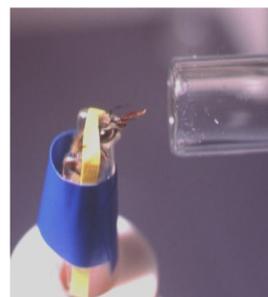
* Ivan Petrovich Pavlov (1849 - 1936), Russian physiologist and experimental psychologist. For his research on the nature of digestion he received the Nobel Prize for Physiology and Medicine in 1904. He is best known for his research on conditioned reflexes in animals, principally his experiments with dogs whereby he fed dogs and rang a bell at the same time so that they associated the bell ringing with food. When he rang a bell after the dogs had been conditioned it caused the dogs to salivate in the absence of food.



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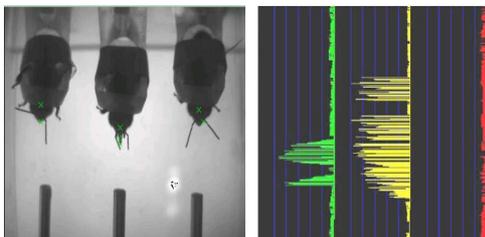
Sniffer bees

In the wild, honeybees use a variety of scents and smells present in a complex background of odours as olfactory cues to help them locate food sources. When they find a source of nectar they remember the smell associated with it for subsequent foraging. INSCENTINEL exploits this learning ability. We train honeybees to associate an odour of interest with a food reward (Pavlovian conditioning). Once trained, bees show a conditioned tongue (proboscis) extension reflex when they encounter the learnt odour.



Conditioned honeybee: the learnt odour elicits a proboscis (tongue) extension reflex

The trained bees are held within individual bee holders housed in a sensor module and sample odours are introduced into the constant stream of clean air which is maintained over the bees. A camera records the bees' responses and special image recognition software interprets the image and outputs a simple electronic YES/NO (present/absent) result.



Positive response: targeted vapours are present in the sample odour.

Inscentinel has harnessed the acute olfactory ability of honeybees and is developing a sensitive, flexible, rapidly re-targeted biosensor for trace vapour detection. Our technology offers biochemical molecular recognition, cost-effectiveness and statistical reliability.

For most compounds, bees are 10x – 100x more sensitive than humans, and our studies indicate that they are at least as good as sniffer dogs. They can detect high parts per trillion (v) concentrations. Finding their limits of detection is an active area of our research.

Inscentinel honeybees are operational all-year round (indoor production system developed), with day and night, 24hr capability. Our bee's can be trained in a few minutes. A large number of bees can be deployed quickly and targeted on a range of compounds.

We have demonstrated the potential for using the extraordinarily acute sense of smell of living bees for detecting a wide range of natural and man-made chemicals: materials of security interest (such as Hydrogen peroxide, DMNB, TNT/DNT, Semtex and PE4), odours associated with diseases (such as tuberculosis), concealed tobacco and alcohol for potential applications at Customs and Excise. Bees have also been trained to detect ripeness in fruit by detecting volatiles before physical signs of deterioration and would be a useful tool for counterfeit detection.

Inscentinel is a creative, dynamic UK company which was spun out of Unilever's corporate R&D program and gained seed capital investment from the Oxford Technology Venture Capital Trust. We are based at Rothamsted Research, an internationally renowned agricultural research institute. Inscentinel works closely with an exceptional network of close associates in both industry and academic settings.



Demonstration of our system for security application with passengers and staff at Roissy CDG airport in Paris.

Technical topics
Boxes—a bewildering array by Richard Alabone (Mr Beesy)

This evening I attended a meeting with 17 student beekeepers seeing a hive opened up for the first time. One of them asked me what type of hive should he buy? What a question! The easy answer is to recommend the one that you use yourself, but I propose now to discuss some of the pros and cons to show why the question had to be asked in the first place.

I started 23 years ago with ten WBC's and then acquired a further twenty, all for free, but soon found that a brood box with 10 National frames was too small, and even a National box with one more frame was little better. As I had loads of supers with Hoffman frames the obvious thing to do was to use brood and a half, which I did for about 10 years. Brood and a half is probably the worst possible system and has little to recommend it, also quite a few beekeepers who start off with a National hive, move on to the double brood system - which is awful.

While I know many good beekeepers who are quite adamant that the National box is big enough, they do have to take precautions to stop the queen running out of space. So I personally would not recommend that a beginner starts with National, because inevitably he will decide he should go larger, although I am aware that many will hotly disagree with this suggestion. Perhaps good advice would be, to say to a beginner, start with one National hive and then decide later if a change in frame size would be for you.

Personally I dislike the Commercial brood frame which is larger than the national, but it's only one and a half inches deeper than a National and 2 inches wider, which is insufficient increase to have to put up with short lugs. Commercial tends to be an Essex favourite, so there again many will advise starting with Commercial, and I suppose you could do a lot worse.

When it comes to supers, there again, there are a good many things to consider. Don't ever buy frames with narrow bottom bars and standard top bars, which reduce the amount of honey in every frame enormously, and make uncapping a chore which should be a pleasure. Wide bars at top and bottom, are without doubt the best; 1 inch or over are certainly to be advised. Commercial super frames are really nice with the wide top and bottom bars of Manly frames, but a box full of honey is too heavy for most people to lift, so many are advised to go for National shallows. I once made a batch of Commercial frames with one and 3/16 bars all around and they are a real pleasure to use. Many beekeepers go for castellated runners, to space the frames, but I think it's nice to be able to adjust the spacing to suit the thickness of combs. Finger spacing doesn't take a moment if you are used to it. Commercial supers can perhaps be lifted by one person if you are young and fit, on and off the hive for inspections, but not carried any distance. Myself, I only carry 6 frames at a time when taking honey away for extraction. A beginner doesn't need to have difficulty deciding which supers to use, because he can have some of each type, as they are compatible: as long as he avoids standard top and bottom bars!

If we don't advise National or Commercial brood boxes - What else? The next size is 14 x 12 which necessitates a special brood box, but if you are buying new it doesn't matter anyway. The only thing to watch, to my mind, is that there is adequate support for the comb within the frame, which is not the case if using standard wired foundation, unless you are very careful and the combs get drawn out to the side and bottom bars which they seldom are. So my answer to the student's question, which hive to buy? was 'get a 14 x 12'. Personally I have three colonies on 12in. deep frames but with 1in. lugs. These are fitted in WBC's using homemade brood boxes with frames 15in. wide which make them compatible with National supers.

In my experiments, over the years with all kinds of frames, I have been able to make several improvements to deep brood frames. Firstly my plastic corners pieces holding four 1in. wide strips of plywood give cheap, easily assembled frames with spacing at the lower corners to prevent uneven comb width. The other advance is to use a single piece of wire in the form of a V and anchored to the bottom bar by a gimp pin bent to form a loop. Additionally a vertical piece of wood prevents comb bulge and sag as shown in the photo. The vertical piece of wood, on one side only, is held in place by the tension in the wire.



This year I have used this same system on Langstroth frames. It does seem to work very well on that shape of frame, without needing the heavy top bar used to prevent sag. As mentioned previously I also use this system on 14

x 14 inch frames which span two National boxes, brood and a half. These frames have the same brood area as Dadant which can house massive colonies.

So there we have it; a very confusing set of possibilities for a beginner to sort out, raising many questions for someone more experienced to answer, and I've only discussed some of the issues. Other factors are choice of material for boxes, white wood, cedar or foam polystyrene? Perhaps its best to use cedar for brood boxes, and white wood for supers. Personally, I have found hardboard perfectly adequate for supers in WBC's, even though they are a bit wobbly. My

Langstroth hive is foam plastic and some of my others are 9mm plywood with foam polystyrene cladding on the outside. While Cedar wood maybe the best material for hives it certainly is not the most cost effective, even though it may last for ever.

Advertise your honey on the new website

If you would like to advertise your honey on the new website, please send your name, details of where you are selling it and a contact number to Stuart Youngs webmaster@ebka.org

Topical Tips—June Margaret Thomas

One subject that came up at our last Divisional meeting was the collection of swarms. Southend Division send lists of beekeepers willing to collect swarms to the Council, Citizens Advice Bureau and the Police. We did discuss the expenses we should claim for collecting a swarm and a figure round £25 to £35 seemed fair for the average mileage for two trips, plus taking the bees to apiary, purchase of a skep, the foundation and the feed. It is to be stressed that this is not a fee, but expenses. Never, never pay for a swarm!

Consider taking any swarms to an isolation apiary, and not moving them until they have sealed brood and the sealed and unsealed brood is normal. Unless you are personally insured do not collect them from a roof, inside a chimney or cavity wall. That is the job for a builder beekeeper or pest manager. Dick has collected them from the gable of the Central Museum, but the fire brigade provided the ladder and back up support.

During the discussion, removing bumblebees were brought up. Though not part of the beekeepers role, they will often be destroyed if we don't collect them. The charge is the same as for a swarm and always stated on the phone. In most cases a shoebox will be sufficient with some dried lawn mowings inside. For a lid I use the original one or a piece of Perspex. Make a largish hole in one of the short sides of the box. Always wear protective gear as they can and do sting, but as the sting has no barbs, they do not suffer the fate that the honeybee does when she stings. The cells are a random bunch of round cells about the size of a small thimble, very higgledy piggledy and made of a brown bees wax. The pupae are covered in a white oval cocoon. Some make a lid for the nest of brown wax, others cover the cells with vegetation, bits of fluff or whatever is handy. The carder bumblebees nest in old grassy tussocks and shred the dried grass to cover the nest.

If possible lift the nest intact onto a trowel or spade and place this in your box. Place a piece of cloth where the nest was and your box containing the nest on top and replace the surroundings as much as they were, to allow the bees to settle. Return in the evening and cover the box with the cloth and move them some miles away. I usually take them home and put them in one of my sheds with a holey door.

They provide endless amusement for you and your family and guests. If you intend to place them outside, make a wooden box, about shoebox size with a waterproof roof and mesh floor for ventilation, and naturally an exit hole. I have used my polystyrene mini-nuc boxes successfully. Bumblebees do suffer wax moth attack, so remove the debris once the nest has died out.

They will raise the next years virgin queens and males later in the season. The time of year varies with the different bumbles. A good indication that the reproductives are about is when you see bumbles with yellow facial hair.

www.essexbeekeepers.com

The Essex Beekeepers Association website has undergone a complete rebuild, with a new look, new features and a new name.

It contains a number of features, such as

- Map showing where to buy local honey, available to any EBKA member to advertise your honey, wherever you are selling it.
- Events Diary detailing local division and EBKA events over the forthcoming year, continuously updated.
- Essex Beekeepers Magazine available for download, including past issues.
- Pollination and Spray information and contacts.

I hope you enjoy the new look and make use of the facilities available.

A big thank you to the working group involved in developing the new site, Steve Pointer, Brian Spencer, Richard Ridler, Pat Allen, Stuart Youngs.

Any changes, updates or additions to the content, please send to Stuart Youngs webmaster@ebka.org

Cont. from page 12

Those are the males. Mating takes place on the ground and lasts over an hour. The mated queens feed up and then dig a hole in a north-facing bank and hibernate till next year. They are those fat bumbles we see about in the spring.

Occasionally the nests are larger, especially if they are in a protected site such as a garage or under a permanently placed mobile home. I have had to use an old honey-jar box to accommodate a large nest. They already had reproductives, and I fed them pieces of honeycomb and any visitor was dragged out to the shed to admire them.

Good hunting.



Essex Beekeepers Association

Present a one-day seminar for the Continuing Professional Development of Beekeepers of all levels & experience at:
Aldham Village Hall, Brook Street, Aldham, Colchester,
Essex. CO6 3RE:

Saturday 25th July 2009 - 10:00am to 4.30pm
"Managing Bee Health - Thriving Not Just Surviving"

With Eastern Regional Bee Inspector Andy Wattam
& Local Seasonal Bee Inspectors.

This relaxed and friendly day will be a mixture of Presentations, Useful Tips & Hints together with Discussion Opportunities and a practical session to include:

- Using Good Husbandry Techniques to lessen Disease Risk and Control Varroa.
- The Umbrella of Apiary Health Planning - 'Looking at the bigger picture'
- Recognising the warning signs early enough to act - Varroa & Viruses
 - The Importance of checking for Adult Bee Disease
 - Exotic Pests - What's the risk potential for Essex?

Important: You will need to bring a packed lunch.
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