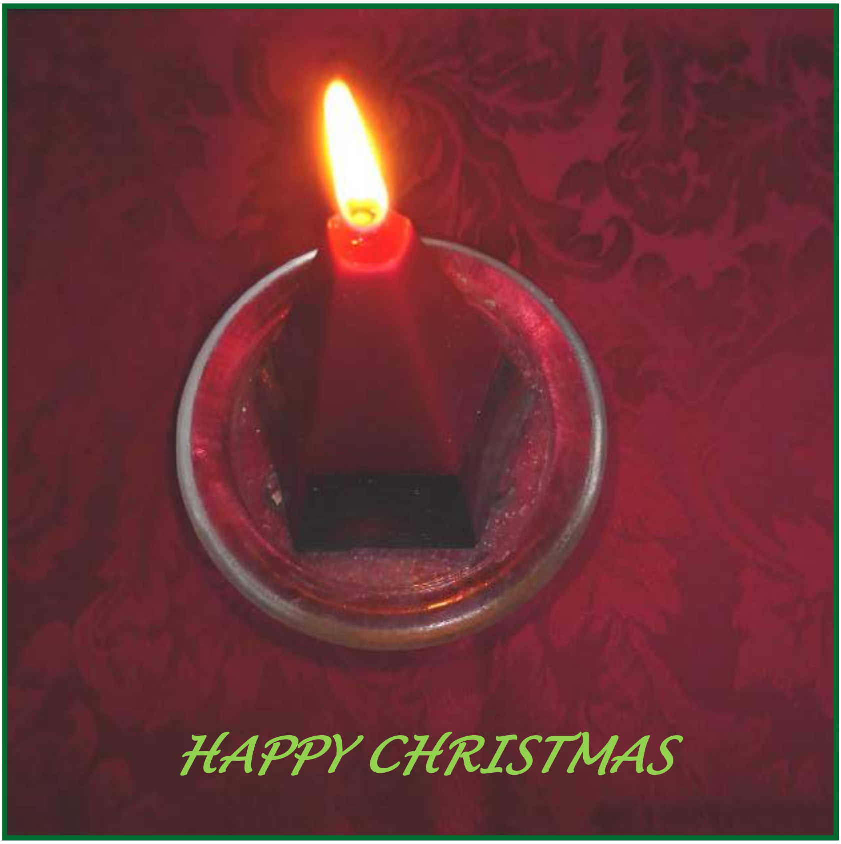
THE ESSEX BEEKEEPER



Photograph - Jean Smye

Monthly Magazine of the Essex Beekeepers' Association

Issue No. 624 **December 2016**

Furthering the Craft of Beekeeping in Essex

Registered Charity number 1031419

EBKA Divisional Meetings

Diary dates for December 2016 & January 2017

1 Dec	Thursday 8.00pm	**Romford**	**'Christmas Social'** - Chadwick Hall, Main Road, Gidea Park RM2 5EL
1 Dec	Thursday 8.00pm	**Harlow**	**Christmas Party** - Kings Church, Red Willow, Harlow CM19 5PA
11 Dec	Sunday 1.00pm	**Southend**	**Informal Christmas Social** at the Roebuck PH, Rayleigh
12 Dec	Monday 7.30pm	**Chelmsford**	'**Bee Social'** - including a quiz. Nibbles will be provided. The Link, Trinity Methodist Church, Rainsford Rd, Chelmsford CM1 2XB
15 Dec	Thursday Pm	**Epping Forest**	**Christmas social and AGM** -
16 Dec	Friday 8.00pm	**Braintree**	**Christmas Social** - bring nibbles. Constitutional Club, Braintree CM7 1TY
21 Dec	Wednesday 7.30pm	**Dengie 100 & Maldon**	**Christmas Soiree** - The Oakhouse, High Street, Maldon CM9 5PR
18 Jan	Wednesday 7.30pm	**Dengie 100 & Maldon**	**AGM** - The Oakhouse, High Street, Maldon CM9 5PR
25 Jan	Wednesday 7.30pm	**Southend**	**EGM** and '**Winter and Spring Honeybee Colony Management'** - Clive deBruyn NDB. WI Hall, Bellingham Lane, Rayleigh SS6 7ED
27 Jan	Friday 8.00pm	**Braintree**	**AGM** - Constitutional Club, Braintree CM7 1TY

NOTE TO ALL DIVISIONAL SECRETARIES

Please notify Jean by the 4th of each month of your meetings,

Annual General Meeting dates in January required please.

Jean Smye - jsmye@sky.com

2016 National Honey Show Report

Well done to all the members who took the time to enter the NHS Show this year. What a shame more Essex members don't enter the National. Of the 12 members who did, all took home money, prizes and some trophies. Why not have a go next year - most of the winners at the County Show at Barleylands would have won prizes there, as we produce some fantastic honey and hive products in Essex.

When you see some of the exhibits in the display class that come from Ireland, Wales and farther afield it makes me wonder why Essex is so poorly represented. I just hope a lot of members went to the show to hear some of the lectures and attend a few workshops. There has been talk of moving the show up to the Midlands and then you will have missed out on a wonderful opportunity that is right on our doorstep

Well done to all again. Jim McNeill   NHS Delegate

Photograph - Paul Abbott

Congratulations to **Janet French** who won two trophies for Cut Comb honey at the National Honey Show - the **Combings Cup** and the **Chairman's Trophy.**

Paul Abbott won the **Dodd Cup** from Essex (as he did last year), the **Commemoration Cup**, **Barns Cup**, **Vincent Cup** and the **Frank Crow Trophy** (all Kent cups).

John Lacy won the **Tremearne Cup** from Essex.

Full list of results on pages 8 and 9.

A Winter's Tale

by Celia Davis

Courtesy of Celia Davis and Warwickshire BKA via eBees

[I know this has been in before, but it could be worthwhile for our newer members]

As you are tucking into your turkey and Christmas pud this year, stop to think for a moment about the bees in your hives. In the middle of winter we tend to forget about them, but those bees are the most important group of bees that will ever live in your apiary and on them depends the existence of the colonies and the success, or otherwise, of next summer's beekeeping.

In late summer and autumn the queen continues to lay, although at a reduced rate. The bees that develop from these eggs will have a lower metabolic rate and little work to do as there are fewer larvae to feed and the available forage is meagre. As a result of this they remain 'young' and do not follow the normal pattern of development and aging which we see throughout the summer, when approximately 3 week old bees graduate from in-hive duties to foraging and, as a result, age and die in about 2–3 weeks.

It is important to realize that the aging process in a bee switches when that bee becomes a forager. At that point in its life, a number of changes take place: its protein levels drop, its Juvenile Hormone (JH) levels rise and it is then on the slippery slope to death. Our winter bees do not make this transition at 3 weeks, but continue in their physiologically young state until the spring, when they kick-start the massive colony growth which precedes the swarming season.

So, how do they prepare for this lifestyle? All newly-hatched workers eat nectar/honey and large quantities of bee bread, which is stored, fermented pollen. The honey provides the carbohydrate in the diet but the pollen contains large amounts of protein plus some fat, minerals and vitamins, and is used to manufacture brood food in the mandibular and hypopharyngeal glands of these young bees so that they can feed larvae.

Young winter bees also consume large quantities of bee bread but they do not use it immediately. Instead, much of it is stored in their fat bodies. These are important as substances, including enzymes and other proteins.

They are spread throughout the body of the bee, principally in the roof and on the floor of the abdomen where they appear as masses of white cells. Well fed, winter bees have abundant fat bodies.

One of the principal stored proteins is vitellogenin, and quantities of this are also stored in the hypopharyngeal glands, which remain plump. In the spring, as new larvae need food, all this stored protein is converted into brood food. With their protein reserves depleted, our winter bees become foragers, the aging process starts and they die.

What goes wrong? Disease is the biggest problem. Varroa has been shown to change the physiology of the winter bees so that they do not store adequate protein, but the main effect of all adult bee diseases is to shorten the life of the infected bee. Varroa, Deformed Wing Virus (DWV) and Nosema, our 3 main culprits, can have a devastating effect on the colony, killing many of the winter bees before the spring bees can build up sufficient numbers to take over. This leads to the classic situation of colony deaths in February and March. Colonies can also die at this time of year if they run out of honey stores, as the increasing population of young bees in the colony puts greater demands on the available stores.

This is all of practical importance to us as beekeepers. The winter bees must be protected by ensuring that they do not suffer from high levels of Varroa during their development. This means treating early, as soon as the honey crop can be removed in August, if Varroa numbers have not been controlled by husbandry means during the active season. It may present particular problems for those taking bees to the heather, as any treatment applied after the return of these colonies will be too late to be effective. They need to go on their travels with low Varroa counts. Controlling Varroa to keep it below the 1000 mites/colony level will also control the viruses, particularly DWV.

Nosema has to be monitored and controlled during the spring/summer by testing the colonies and getting them onto new comb if necessary. There is no chemical treatment available. Progress can be made by breeding from colonies not showing the disease and removing those queens which are susceptible.

Finally, and very importantly, colonies need good supplies of pollen during the later part of the summer so should be sited where sources are available (the use of pollen supplements or substitutes is debatable). There is of course, no excuse for colonies dying of starvation and every effort should be made to supplement stores of honey if necessary in September.

HONEYCOMB - *why is it needed?*

First of all it is not just honey comb that we will discuss, because comb has more functions that just containing honey. In addition to providing the prime structure for brood rearing, products storage etc. within a hive or nest, comb is also used for the following functions.

- Transmission of vibrations created by worker bees and the queen bee.
- Pheromone deposition.
- Emission of volatile odours that serve as a foraging stimulus.
- Dancing platform for communicating the best foraging sites.
- Clustering for thermoregulation.
- Water spreading for thermoregulation.

Comb is an essential, expensive and permanent investment for the honey bee colony. The comb in a typical nest of a fully-established colony in the wild, will be made from about 1.2 kg wax, contain about 100,000 cells and have a surface area of about 2.5 square metres. Each individual piece of comb will be securely attached to the roof and sidewalls of the nest, but occasional gaps are left between the comb and the sidewalls to allow bees to pass between the various seams.

About 7.5 kg honey will have been used in the comb manufacture, equivalent to over a third of the colony's winter energy requirement. At least 6 g of honey is used in the manufacture of 1 g beeswax. It takes about 66 bee hours to convert this into 20 square centimetres of comb. Being such an expensive resource, a honey bee colony only adds to it in response to immediate demand. Wherever possible, damaged cells are repaired and wax scraps such as cell cappings are recycled by the colony.

Queen cells are built from bits of wax cut away from adjoining worker cells and once used, they too are recycled.

Comb Architecture

Each piece of comb comprises a flat midrib of wax about 0.1 mm thick. On either side of this is a layer of tessellated hexagonal cells with wax walls approximately 0.075 mm thick. Each cell floor is angled upwards at 13° to the horizontal from the base to the opening to prevent honey contents from spilling out.

Typically, worker cells have a diameter of about 5.2-5.4 mm and a depth of about 15 mm. Somewhere on the periphery of the brood nest will be a solid area of drone comb, these cells have a larger diameter of about 6.2 - 6.4 mm and a depth of about 16 mm.

For obvious geometric reasons, cells at the very margin of the drone brood area are necessarily irregular. Between each parallel face of wild comb is a seam of near-constant width in which the bees move and work. This is typically 9.5 mm wide.

The tessellated hexagonal arrangement maximises cell density on the comb face by avoiding any dead space. Furthermore, as each cell wall is shared by two cells, the quantity of wax used per cell is kept to an absolute minimum. By all these means material economy is optimised. Material strength is enhanced by the non-alignment of cells on each side and 1 kg comb can easily support 22 kg honey at normal hive temperatures.

With thanks to John Chambers and Warwickshire BKA, via ebees.

Toxic foundation

If fake and contaminated honey wasn't enough to contend with, a new threat has come along to haunt us. Foundation wax made using paraffin wax, stearin and colourants is on the market and is mainly being sold online through auction sites and the like.

What is wrong with using it? Unfortunately some of the ingredients are toxic to the younger larvae. The queen will apparently keep on laying and laying. The eggs will hatch, but most of the larvae succumb, leading to a 'pepperpot' brood pattern. So beware! This 'fake' foundation tends to be more yellow in colour than natural beeswax foundation, and the stearin variety is much more pliable than genuine beeswax.

Courtesy of *somersetbeekeepers.org.uk via e-bees*

EBKA members successes at the National Honey Show 2016

PAUL ABBOTT Southend Division

1st in Classes: 54 Photomicrograph , 77 One Section, 130 one bottle Sweet Mead, 132 one jar Set, 181 one Comb for Extracting, 185 three jars Different Honeys, 194 Sweet Mead.

2nd in Classes: 9 Nine jars & Frame for Extracting, 129 One bottle of Dry Mead, 131 One jar Clear, 191 Three Moulded candles, 192 Three not Moulded Candles

3rd in Classes: 22 two Sections, 59 Coloured Print, 61 Black & White Print , 184 two jars Dark, 193 one bottle Dry Mead.

4th in Class: 11 two jars Light Honey.

VHC in Classes: 71 two jars Light , 128 Six wax Blocks, 186 two jars Set, 188 one Container Cut Comb.

HC in Classes: 21 two Sections, 24 Frame for Extracting, 55 Set of Digital Images, 76 two jars Set, 182 two jars Light,, 189 one jar Clear.

C in Class: 60 Colour print Close Up or Macro .

JOHN LACY Chelmsford Division

1st in Classes: 186 two jars Set, 190 one piece Wax

3rd in Classes: 29 one piece Wax, 189 one jar Clear

VHC in Class: 30 one piece Wax 340g

HC in Class: 183 two jars Medium Honey

C in Class: 5 two jars Clear Honey

JANET FRENCH Braintree Division

1st in Classes: 26 Container Cut Comb, 110 Two Containers Cut Comb

WALTER GEE Chelmsford Division

2nd in Class: 182 two jars Light

3rd inClass: 188 Container Cut Comb

C in Class: 189 one jar Clear

PAMELA HUGHES Chelmsford Division

3rd in Class: 183 two jars Medium Honey

ROMFORD DIVISION

3rd in Classes: 182 two jars Light, 186 two jars Set

IAN NICHOLS Epping Forest Division

2nd in Classes: 183 two jars Medium Honey, 184 two jars Dark

3rd in Class : 241 two jars Light

MICHAEL BARKE Harlow Division

1st in Class: 182 two jars Light Honey

2nd in classes: 181 Frame for Extracting, 193 one Bottle Dry Mead

3rd in Classes: 190 one piece Wax , 194 one Bottle Sweet Mead

VHC in Class: 189 one jar Clear

TED GRADOSIELSKI Epping Forest Division

1st in Classes: 103 two jars Dark, 184 two jars Dark, 189 one jar Clear

VHC in Class: 181 Frame for Extracting

TERRY WATSON Romford Division

1st in Class: 183 two jars Medium Honey

JANET CHIPPERFIELD Romford Division

2nd in Class: 47 Artistic Exhibit of Needlecraft

JAMES MCNEILL Romford Division

1st in Classes: 192 Three not moulded Candles, 193 one bottle Dry Mead

2nd in classes: 186 two jars Set, 194 one bottle Sweet Mead

3rd in Class: 181 Frame for Extracting

VHC in Class: 76 two jars Set

HC in Class: 241 two jars Medium Honey

Thank you all for making the effort to represent your county

The Winter Cluster

Honey bees play it both ways during the winter, they act both as ‘cold-blooded’ insects, and as a ‘warm-blooded’ super organism.

There are a number of reasons why this is advantageous.

An individual bee reaches ‘chill coma’ at about 44°F (6.7°C), and will die if held at the edge of freezing for a few days.

So the cluster must generate and conserve enough heat to keep all members of the colony at least above that temperature for the duration of the winter. This process requires only a small amount of honey consumption, less than a pound a week even under severely cold winter conditions. The cluster must also maintain the ability to warm up enough to move to reach new areas of the hive in order to access food stores.

This is how the winter cluster forms:

- There is a fairly loose core of bees in the centre that maintains a moisture content of the air means that temperature of about 80 — 95° F (26 – 35°C) In small clusters, the core temperature may drop to 60 — 70°F (15 – 20°C).
- Around the core, there is a tightly packed layer of bees that maintain a temperature of about 56°F (13°C), which is a critical temperature, below which the cluster will die.
- At the very outside, or ‘mantle’ of the cluster, individual bees do not allow their body temperatures to drop below about 44°F (6.7°C) which is just above their ‘chill coma’ temperature.
- These bees may burrow deeper into the cluster from time to time and very rapidly raise their body temperature, then return to the mantle after several hours. If a bee’s temperature falls below 45°F (7.2°C) it is no longer able to flex its muscles to generate heat

The actual cluster size is dependent upon the ambient temperature - it can expand or contract to an amazing extent.

The core of the cluster is an otherworldly environment. The bees actually modify the atmosphere in order to allow themselves to enter into a 'hypoxia-induced ultra-low metabolic rate' (Van Neuman 1997). They restrict ventilation to let the oxygen content drop from the normal 21% down to only about 15%, and allow CO2 to rise to 56% (up from 0.038% in normal air). This atmosphere would be toxic to humans, but allows the bees to go into a form of suspended animation.

Water loss in the winter cluster is very important. Insects lose water vapour with each breath, just as mammals do, but they have no source of drinkable water within the winter hive. In cold winter areas, the extremely low moisture content of the air means that when the cluster creates heat the relative humidity of the cluster atmosphere drops extremely low. Insects can hold their breath, (for up to a day at a time), in order to prevent water loss and it is likely that bees in the cluster do the same. When animals and bees metabolise carbohydrates, such as sugar, they create 'metabolic water' as a by-product. If the bees can conserve this metabolic water enough to be in excess of that lost to respiration and any body waste, then they can actually realize a net gain of water.

So, how much water do bees get out of honey? A pound of honey at 83% sugars, contains 0.17 lb of water and creates 0.48 lb of metabolic water, giving a total of 0.65 lb of water freed from each pound of honey consumed. This means that a colony typically consuming 0.8 lb of honey a week, (*Holte 1970*), would produce about a half a pound (1 cup) of water per week. It may be a challenge for a large colony to live on this amount of water so there is good reason to provide an available source of water, together with good hive ventilation to help overwinter your bees.

Adapted: Susquehanna BKA & Bournemouth BKA via ebees

So, now an article on …….. **Hive Ventilation** -

Excess in-hive moisture is probably one of the bees' worst enemies. And yet, it is the bees themselves that are the main source of water inside a hive through their metabolism.

In order not to suffocate, the bees need to continuously bring fresh air into the hive. If there is brood they will increase the temperature of the air to 34°C within the brood nest, or else the brood would be chilled.

The condition of the air outside the hive may be typically at 4°C or lower with a damp relative humidity (RH) close to 100%; conditions that may be common in the Winter and the early Spring.

So, warmed air that is laden with water vapour and CO^2 constantly rises out of the cluster. It then rapidly cools down and releases the water it can no longer hold. This water condenses on all the interior surfaces of the hive that are cold, stores and combs included, since the bees do not heat them.

Also when the bees consume stores for energy to flex their muscles to keep the cluster warm they generate water vapour.

When too much water condenses on the upper surfaces of the hives and on the combs that hold bee bread and honey, the stores may become mildewed, the honey may ferment, and cold water drips down onto the clustered bees. The spoiled food and the cold showers delay the development of the colony and, at times, may create bee health and nutritional problems.

Measurements using the Arnia hive monitoring equipment suggests that typically during the Summer the relative humidity (RH) within the hive is 55%, whereas in the Winter it rises to 65%. It also fluctuates in response to the ambient environment conditions.

Live trees provide bees with remarkably sound nest cavities, because they actively draw moisture out of the hollows. In addition, their leafy canopies offer protection from the sun. By comparison, many of our hives simply are heat and water traps.

How much water a bee colony can produce inside its nest depends mainly on its size. It is easy to calculate that a decent-size colony may generate one half-cubic foot of water between December and the end of March from its stores and the nectar it may collect in the early Spring. This is the equivalent of almost four gallons (eighteen litres) of water or five inches (thirteen centimetres) of water that can rain down onto the bees and combs of a colony that is overwintering on seven frames per super !

So what are the recommendations for your hives during the Winter ?

- If possible use an **open mesh floor** to improve circulation and air exchange.
- Insulate the roof to increase the temperatures at the top of the hive, (and preferably also insulate the side walls to reduce condensation).

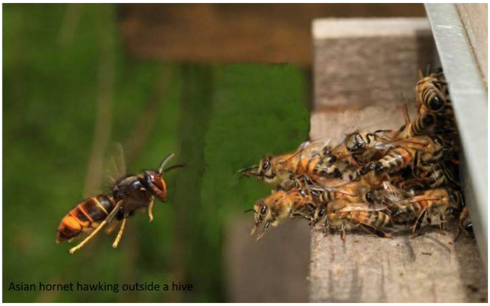
- It is important to avoid cold temperatures and condensation at the top of the hive. So rather than increase the ventilation, by such as inserting match sticks under the crown board, which will cause a temperature drop, it is better to insulate the roof.
- Insert dummy boards on both sides of the brood and super boxes to improve air flow. This will enable the moisture filled air to flow down from the top of the hive and be exchanged with fresh air through the open mesh floor.

If your hives have **solid floors** you may need to consider an alternative approach.

- Assist hive ventilation by leaving ventilation holes either by inserting matchsticks in the corners below the crown board or by leaving the feed hole in the crown board open.
- Insulating the roof and walls to reduce condensation and the use of dummy boards to improve air flow are probably also beneficial.

Based on an article by Sacramento BKA via Reigate BKA

Clear and present threat



Asian hornet hawking outside a hive

All the speculating is over, because as reported all over the media, the Asian hornet (*vespa velutina*) has arrived.

First sighted in Tetbury, a dead hornet has been found 'just north' of the Mendip Hills in Somerset. Although APHA are being vague as to its actual location, the area they describe is very small, as there is precious little of Somerset to the north of the Mendips. Regardless of the exact whereabouts, worryingly, it seems to have travelled 30 miles in one leap.

There is so much misinformation in the press that it is very difficult for the uninitiated to make a valid judgement. Many of you will be aware that a beekeeping supplier had posted a link to a video of the Giant Asian hornet (*vespa madarinia*), claiming that it shows the 'Killer Asian Hornet' and the damage it does, while stating that the video is 'not for the squeamish'.

As temperatures drop, it may seem that the problem has gone away, because hornet colonies die off in the autumn, just like wasps, but they may have created new queens which have mated and will hibernate. The danger will come next spring when those mated queens set up new colonies.

The Regional Bee Inspector for South West England, Simon Jones, has sent the following message for general circulation.

Following the confirmed finding of a dead Asian Hornet in Somerset it is important that we have as much up to date information as possible. A specific email address has been set up for your members to use to advise us if they have any apiary with bees. If they can please send us the following information to:

beekeepers@apha.gsi.gov.uk

- Name ·
- Home address and postcode ·
- Contact telephone number ·
- Email address ·
- Apiary location – ideally an OS map reference please ·
- Number of colonies on the site

This email box will be monitored by the NBU office team who will check to see if we have that apiary recorded on BeeBase and add it if not.

Courtesy of Somerton BKA via ebees

Who's who and how to contact them

President of EBKA **Pat Allen** Hon CLM

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Harlow: Nick Holmes 07730 735 752

Epping Forest: Robin Harman 07971 237 312

Romford: Pat Allen 01708 220 897

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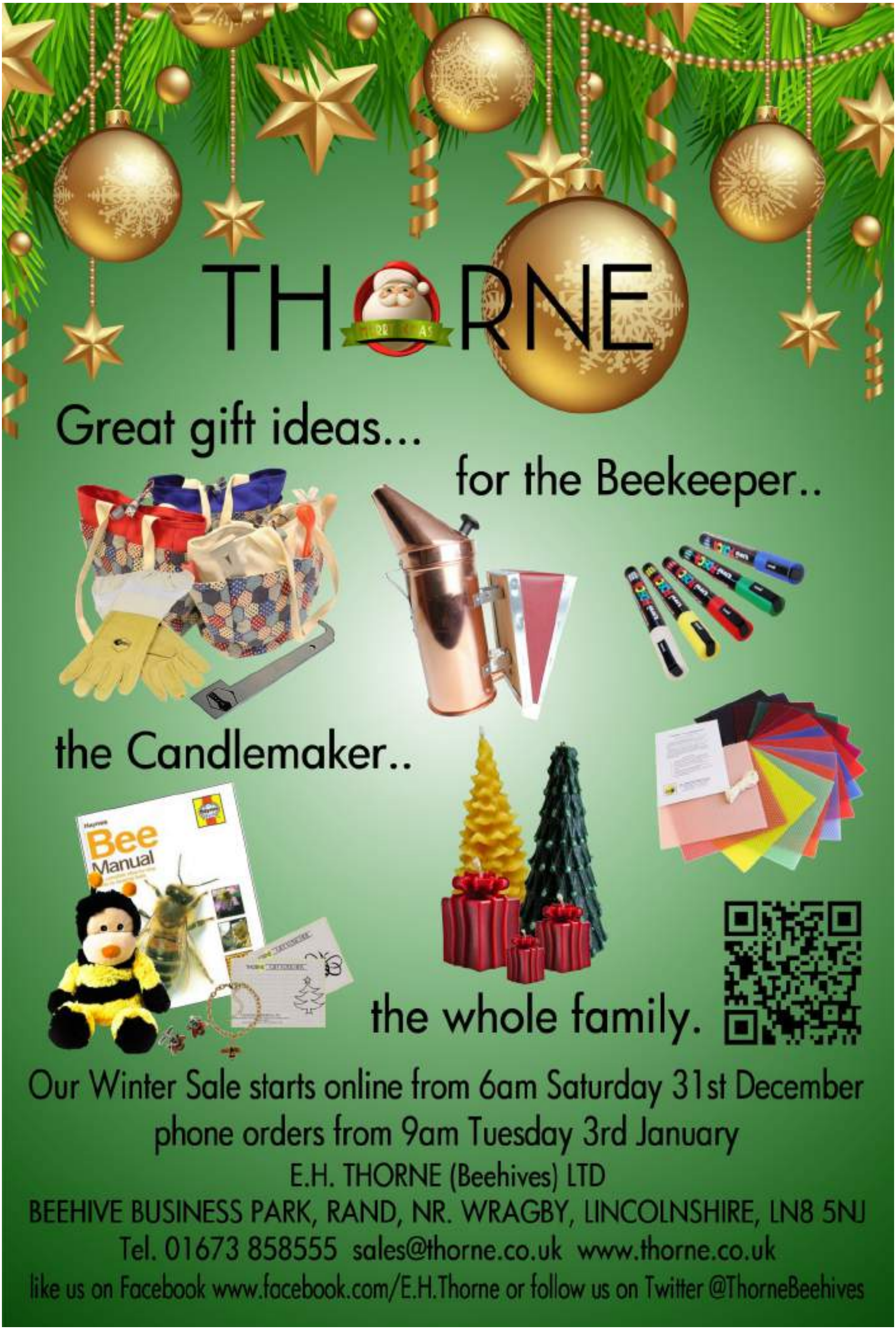
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