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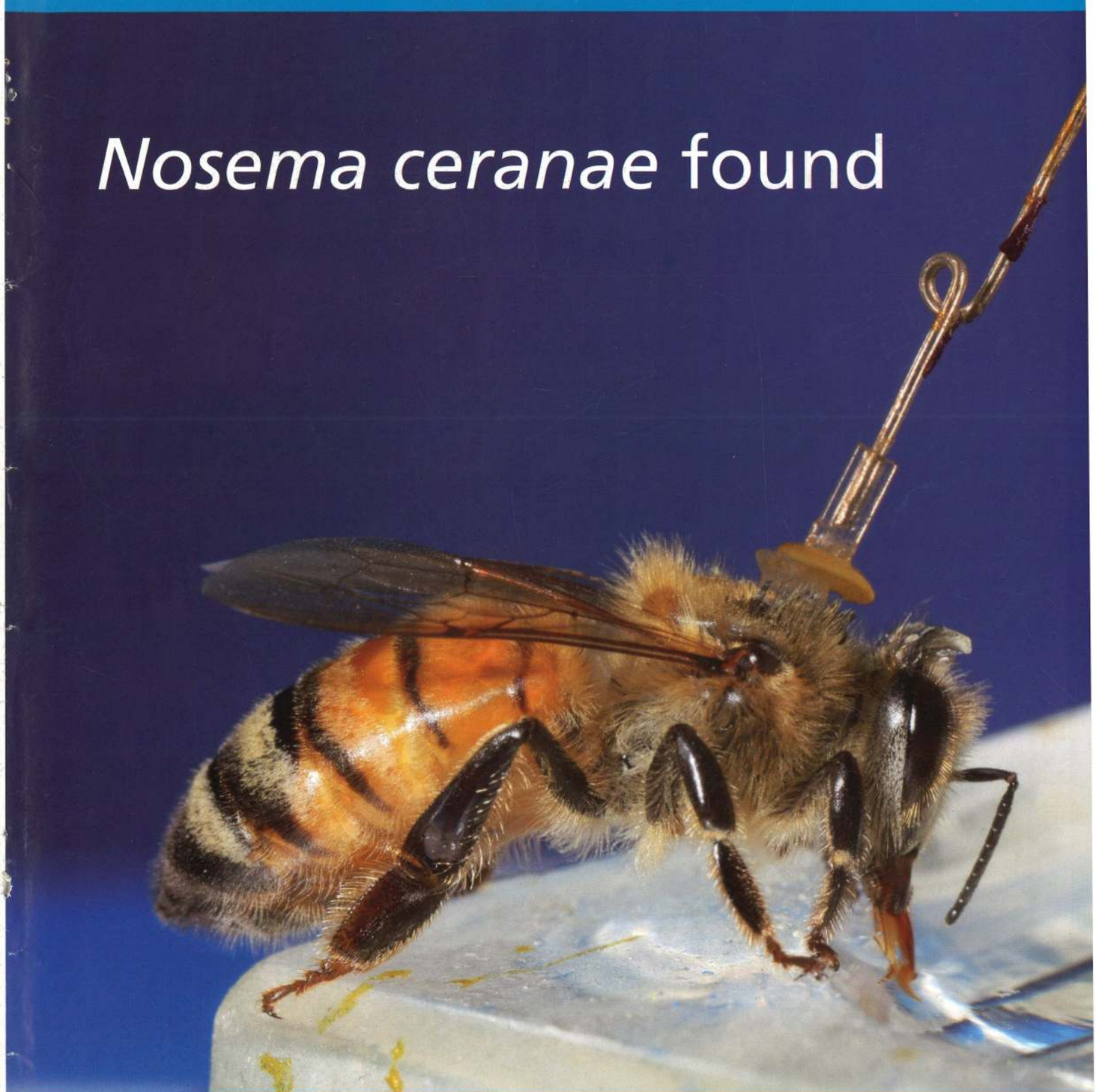
The New Zealand BeeKeeper

Nosema ceranae found



- Bee Fest Symposium in Auckland
- Insight into mite treatments
- Mesh screen hive floors
- AFB field day/beehive registration

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Front cover: Bee with transponder loop. Photo: Vivian Ward, University of Auckland. Go to page 14 for a report on research presented at the Third Annual Southern Hemisphere Bee Fest Symposium, University of Auckland, 2–3 December, 2010.

Nosema ceranae: where to from here?

By Tony Roper, Apicultural Officer, AsureQuality Limited, Christchurch, tony.roper@asurequality.com

Most beekeepers have probably heard the bad news.

This past spring (September 2010), the bee disease *Nosema ceranae* was discovered in the Coromandel Peninsula. *Nosema ceranae* has also been confirmed in Christchurch in January this year.

Before this, *Nosema ceranae* (*N. ceranae*) was classed as an exotic bee disease and regarded as an unwanted organism in this country. The absence of this serious pathogen in New Zealand was part of the case to restrict the entry of Australian honey.

Furthermore, MAF Biosecurity has determined that eradication of this disease is not feasible, so New Zealand beekeepers will need to learn to cope with this disease and the extra problems it may cause.

What exactly is *Nosema ceranae?*

Nosema ceranae is a honey bee disease caused by a microsporidian (parasitic spore-forming protozoa). This microsporidian is too small to be seen with the naked eye but can readily be seen under a microscope (x400 magnification). Like American foulbrood (AFB), this pathogen exists both as a spore form and a vegetative form. In the spore form, which is the dormant stage, it can survive for years on beekeeping equipment and/or in honey or pollen.

Nosema ceranae spores can even survive in water, such as in pools found near apiaries. In the vegetative form, it is active inside the cells of the bee and multiplies to form further spores.

Spores are introduced into the hive when foraging bees come in contact with infected material, such as a contaminated water source or infected honey robbed from a colony. These spores are ingested by the bees, then pass into the midgut (which has a similar function as a stomach in other animals), where the spores germinate and develop into the vegetative form of this disease. The growing microsporidian penetrates the cells in the midgut of the bee and produces many more spores. This process destroys the cells in the midgut, which progressively reduces the ability of the bee to process food. In advanced infections the bee will eventually starve. Destruction of the midgut lining may also allow the entry of viruses into the bee's blood stream or haemolymph.

Infected bees will often defecate within the hive, particularly if they are confined to the hive due to bad weather. This infected faecal material is subsequently cleaned up by house bees, themselves ingesting spores and becoming infected, which continues the cycle of infection. Larvae and pupae are not affected by *N. ceranae*, only adult bees (Webster, 2010).

Bees infected with *Nosema* show no outward signs of disease but only live half as long as non-infected individuals (Bailey, 1991). Spotting on the front of the hive can be caused by *Nosema* infection. Bees with problems in their digestive system will often defecate on the front of the hive, as they exit and crawl up from the entrance (Webster, May 2010). Other symptoms associated with *N. ceranae* are reduced honey production and increased winter mortality. Bees infected with *N. ceranae* have a higher hunger level that leads to reduced survival and a shortened life span. The hypopharyngeal glands fail to develop in nurse bees so that infected bees are less able to feed larvae. Queens infected with *Nosema* cannot lay properly and are superseded (Collison, 2010).

How did this disease arrive in NZ?

The spore form of *Nosema ceranae*, like AFB, is very resilient and is likely to remain viable for a number of years. In reality we do not know how *Nosema ceranae* arrived in New Zealand as there are a number of possibilities. Introduction vectors could include material that has been in contact with infected bees or in bee products such as honey, pollen or royal jelly.

As pollen has been imported into New Zealand from other countries such as Chile for artificial pollination of kiwifruit, there is a possibility that *Nosema ceranae* may have been accidentally imported this way.

Accidental or deliberate imports of infected bees may have facilitated the introduction of *N. ceranae*. Swarms of honey bees can travel by ship and have reached New Zealand in this way in the past. Alternatively, illegally smuggled queen bees could also be responsible for the introduction of *N. ceranae*. It is also possible that shipping traffic from Asia may have facilitated the introduction of the Asian honey bee (*Apis cerana*), the original host of *N. ceranae* (Roper, 2008). These bees could have survived long enough to directly or indirectly transfer the disease into resident honey bee colonies.

Finally, another possibility is that *Nosema ceranae* has been in New Zealand for a number of years and has come in with importations of European honey bees years ago when such importations were allowed.

It would be a useful exercise to test a number of hives throughout the country to determine the exact distribution of *Nosema ceranae* so that beekeepers would know if they have to change their management practises to best cope with this new disease.

Recent MAF Biosecurity New Zealand response

When *Nosema ceranae* was first detected here in September 2010, MAF Biosecurity launched a very small delimiting survey to determine the extent of this pathogen around the original source apiary. Surveying of several Coromandel-based beekeeping operations and two apiaries in the Northern Bay of Plenty resulted in a number of apiaries testing positive for *Nosema ceranae*. On the basis of these positive results and the fact of the high hive movements in and around the Coromandel Peninsula, MAF Biosecurity concluded that *Nosema ceranae* was well established in New Zealand and eradication was not feasible. Refer to the MAF Biosecurity NZ website (www.biosecurity.govt.nz/pests/nosema-ceranae) for more details.

The information on the MAF Biosecurity NZ website also suggests that *Nosema ceranae* may not be the primary cause of Colony Collapse Disorder (CCD), based on earlier work done by US researchers. However, in a recent paper, a group of US researchers

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found this may not be the case as *Nosema ceranae* was found to be an important factor in CCD (Bromenshenk, 2010). The researchers found that *Nosema ceranae*, in combination with a particular virus known as an invertebrate iridescent virus (IIV), implicate co-infection with CCD. This paper also mentions that there is a New Zealand strain of IIV, which could be bad news for New Zealand beekeepers, as it appears that we may have the two ingredients required for CCD present in this country.

Problems facing NZ beekeepers

It will be most helpful if beekeepers knew the full extent of this disease because it is quite conceivable that some areas of the country may be completely free from *Nosema ceranae*. If beekeepers know their hives are likely to be infected with this new disease, then they can take steps that may mitigate its effect on their hives.

Nosema ceranae, like *Nosema apis*, causes premature aging in all adult bees, i.e. workers, queens and drones. Therefore a number of bees will be lost prematurely and this can lead to problems for the beekeeper trying to get the hives up to maximum colony population. The hypopharyngeal glands of infected nurse bees contain *Nosema ceranae* DNA (Webster, 2010). If the hypopharyngeal glands are affected, this will have a detrimental effect on the production of royal jelly and aid in the spread of the disease within the colony. For beekeepers preparing hives for pollination this disease could make the job a lot harder. With honey-producing hives there could also be an economic impact with the hives below strength as there will be a loss of production. If queens are infected it is likely that they will be superseded and this can, in turn, result in a reduced honey crop.

Nosema ceranae can also infect bumble bees (Paxton, 2009). As most beekeepers will have observed, bumble bees will readily enter honey bee hives to rob them. Bumble bees could in theory spread *Nosema ceranae* between hives. Another negative of this disease infecting bumble bees is that it will probably shorten their lives also and have a major detrimental effect on this species.

What you can do

Fortunately there are a number of things a beekeeper can do to minimise the effect of *N. ceranae* on their operation. It is most important to minimise stresses on colonies by improving colony management techniques, such as avoiding unnecessary colony manipulation and movement, together with treating correctly for varroa mites.

Some beekeepers may need to change the way they manage their hives for pollination because shifting colonies into orchards can be very stressful on their bees, especially if they are also heavily infected with *Nosema ceranae*. Apiaries must be sited well to provide a pleasant environment for bees that makes it easy for them to take cleansing flights. I was recently inspecting hives with some experienced Canterbury beekeepers and we commented on the poor location of one particular apiary. One of the beekeepers, John Symes, said to me, "never put a hive where you would not be comfortable to be yourself". This is good advice as hives should always be sited in sunny spots sheltered out of winds. An apiary in a sunny, sheltered spot will be a few degrees warmer and the bees will do so much better (Roper, 2008). The apiaries must also be sited close to good sources of honey and pollen, preferably pollen of high protein content, such as gorse. Note that high protein pollen can help reduce the level of *Nosema* infection in the colony (Morse, 1997). Avoid confining bees as this places major stresses on them. Even making sure that varroa treatments are carried out in a timely manner will help to minimise stresses on bees.

N. ceranae-*infected hive showing a lack of nurse bees. Photo: Tony Roper.*

Another important management tool a beekeeper can use to minimise the impact of *Nosema ceranae* is to reduce the number of spores in the colony as they can cause re-infection. First, try to reduce spore counts on equipment by culling out and replacing old combs. Clean and repaint boxes, or better still, paraffin-dip them. Using acetic acid, bleach or heat treatment will kill *N. ceranae* spores (Webster, May 2010), as will UV light from sunlight (Webster, April 2010). As mentioned earlier, water can be a potential source of spores, so try to ensure bees have access to a fresh uncontaminated water source. Also avoid squashing bees because other bees need to suck their body fluids out first before they can shift the dead bee and this can be a source of infection. Try to prevent dysentery in your bees by making sure they have good quality food and are free to fly at all times. Because opening hives stresses bees, try not to disturb colonies, especially in winter and early spring. Also, early brood rearing can increase the risk of *Nosema* if bees cannot take cleansing flights (Morse, 1997), so avoid stimulating colonies in late winter/early spring by feeding sugar syrup if bees are likely to be confined for long periods.

The antibiotic fumagillin (sold under the trade name FUMIDIL-B®) is very effective

in controlling the vegetative stage of both *Nosema apis* and *Nosema ceranae* (see www.nzfsa.govt.nz/acvm for registration conditions); however, it does not kill spores. This antibiotic is available in New Zealand for *Nosema* treatment and prevention, but for use only in hives producing queen bees and bumble bees. It cannot be used in honey producing hives because there is a possibility that residues may get into the honey used for human consumption. The beekeeping industry may wish to discuss the possibility with government (New Zealand Food Safety Authority) of having the use of fumagillin extended to include the treatment of hives for pollination.

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MAFBNZ

When bees go feral

By Katie Owen, Senior Adviser, Animal Response, MAF Biosecurity New Zealand

Problems associated with honey bee pests or diseases are a significant issue for MAFBNZ, the bee industry and indeed New Zealand.

Once such a pest or disease is confirmed in New Zealand, it may be necessary to eradicate all feral honey bee colonies in the area.

With feral colonies often difficult to locate, it is usually easiest to kill them by laying poison baits. However, without a suitable chemical for killing feral bee populations, supported by regulatory and legal tools, the probability of a successful response to a bee incursion is limited.

While Ascend®—the active ingredient imidacloprid or fipronil—had previously been identified as an effective product for killing feral colonies, since 2006 the company which owns the chemical's patent has not allowed it to be used in New Zealand.

This has had a number of results, including:

- MAF commissioning HortResearch to investigate a range of alternative chemicals. However, this research has been unable to identify any chemicals suitable for killing feral bees, meaning at present imidacloprid is the only realistic alternative for depopulating areas of bees.
- MAF soliciting limited infringement advice from intellectual property lawyers on the use of fipronil and imidacloprid.
- Consultation between MAFBNZ and other regulatory bodies (e.g., ERMA and ACVM) on registering appropriate chemicals for off-label use during urgent measures.

Finally, a project proposal to be undertaken by MAF in conjunction with Plant and Food Research is currently awaiting final approval.

Who do you call?

Recently the Secretariat has been receiving a lot of calls regarding hive registration and pest management issues, most of which we are unable to answer as those issues are dealt with by other entities. So, to make it easier for you to know who to call for what, we thought we would give you an easy reference guide.

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Field day on AFB and beehive registration

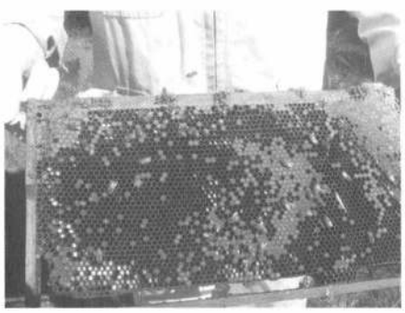
By Mary Allen, Raetihi

On 4 December 2010, a group of beekeepers in the Okakune and Raetihi areas held a field day focusing on American foulbrood (AFB) recognition.

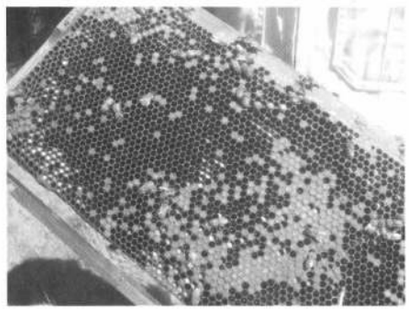
Although the field day was held as a refresher for those who had obtained their DECA (Disease Elimination Conformity Agreement), several new beekeepers came as well.

These days are beneficial to all, as before any disorder or disease can be recognised, a beekeeper needs to know what healthy bee brood looks like. Bee field days also provide an opportunity for other people who keep bees to meet each other, share ideas and to help each other.

The yellow AFB book helped during our discussions. *[Editor's note: the 'yellow book': Elimination of American foulbrood without the use of drugs — a practical manual for beekeepers', originally written by Dr Mark Goodwin and Cliff Van Eaton and revised by Mark Goodwin in 2006, is published by the NBA and available for sale. Refer to the publications form insert in the December 2010 issue, or go to the Publications section on the NBA website www.nba.org.nz.]*



Andrew Allen holds a frame infected with AFB.



Another view of the frame, showing unhatched brood with sunken cells. Photos: Mary Allen.

Registration of beehives

During our period of sitting around discussing bees, one person confessed he had not registered his hives. He bought them from another beekeeper, who had explained that he had to register his beehives but did not explain how to do it.

This new beekeeper rang MAF and was told, "we do not know anything about that".

He then rang the local council and was told much the same thing.

Next he tried the NBA website, and became confused at what he was registering for.

> "How does a person know the law when he catches a swarm of bees?"

We had the AFB NPMS website (http://afb.org.nz) on screen, but offline. As it takes an age to download anything, I had done it beforehand and remembered to disconnect. I found this website one of the easiest to use and fairly quick to download. The new beekeeper found the form on the AFB NPMS website to register his hives *[Editor's note: go to the Forms section to find the form appropriate to your situation.]*

This conversation made me think about who is responsible for ensuring hives are registered.

Most things we buy or acquire we do not need to register. We all know we need to register our car or dog. How does a person know the law when he catches a swarm of bees?

I feel everyone should be responsible:

1. The new beekeeper. The law does not accept "I did not know a beehive had to be registered" as an excuse.

2. Existing beekeepers. It may help to prevent diseased hives in the area; also the new person may become a member of the beekeeping organisations.

3. Beekeeping suppliers. I think most do that. Now that more people are buying their beekeeping gear from the Internet, they are missing out on other knowledge.

4. The AFB NPMS (American Foulbrood National Pest Management Strategy) Management Agency.

5. AsureQuality Limited: when we send in our yearly statistics we have to put down to whom we sold hives. They could follow this up.

I think we all should advertise the need to register beehives whenever we are able.

Editor's note: for more information about how to register apiaries, and the Apiary Register, go to the AsureQuality website http://www.asurequality.com/services-to-the-apiculture-beekeeping-industry/apiary-register.cfm

See also the 'Who do you call?' box on page 7.

Bee Losses Survey—a reminder

Thank you to all those who have completed the survey and returned it to the national office.

The information we are gathering as a result is of great importance and will be extremely valuable in building cases to ERMA, MAF and AGCARM for re-evaluating a range of pesticides and for raising the bar in horticultural application practices. Both ERMA and MAF have expressed their interest in the results of the survey.

We appreciate this is a very busy time for you all, but if you have experienced bee losses for whatever reason we would encourage you to take the time to complete the survey and send to us.

If you would like further copies of the survey, please email pauline@nba.org.nz

A copy is also available on www.nba.org.nz

Pesticides-CCD-IIV-CCD-Bayer?

Compiled by the NBA National Office

First we heard that the mysterious case of the missing honeybees might be solved.

Since 2006, billions of bees have flown from their hives and simply disappeared as part of a mysterious malady called Colony Collapse Disorder. The phenomenon in which disorientated honeybees die far from their hives has kept scientists, beekeepers and regulators desperately seeking the cause.

The long list of possible suspects has included pests, viruses, fungi and also pesticides, particularly so-called neonicotinoids, a class of neurotoxins that kills insects by attacking their nervous systems.

For years, Bayer Crop Science, a leading manufacturer of neonicotinoids, has fended off regulators and lawsuits from angry beekeepers who allege that the pesticides have disorientated and ultimately killed their bees. They maintain when used correctly, the pesticides pose little risk.

A timely article very recently in the *New York Times* under the headline 'Scientists and Soldiers Solve a Bee Mystery', described how a newly released study pinpointed a different cause for colony die off; 'a fungus tag-teaming with a virus-IIV (insect iridescent virus). The study, written in collaboration with US Army scientists, analysed the proteins of afflicted bees using a new Army software system. There was no mention of pesticide involvement.

But then ...

University of Montana biology researcher Professor Jerry Bromenshenk was among the first to document CCD when it appeared four years ago. Professor Bromenshenk worked on the project, commenting, "It's a work in progress, but it may be the most important advance in the search for the cause of CCD in the previous three years".

When the beekeepers brought a class action against Bayer in 2003, Professor Bromenshenk signed on to serve as an expert witness on the beekeepers' behalf. He then dropped out.

Professor Bromenshenk subsequently received a significant research grant from Bayer to study bee pollination. His company Bee Alert Technology, which is developing hand-held acoustic scanners that use sound to detect various bee ailments, will profit more from a finding that disease and not pesticides is harming bees.

> "Studies in the US have shown that at low doses, the neonicotinoids have sublethal effects that impair bees' learning and memory."

Professor Bromenshenk denies that receiving funding from Bayer to study bee pollination had anything to do with his withdrawing his support as an expert witness in the beekeeper's litigation against Bayer.

Dr Jennifer Sass, a senior scientist with the health group at The Natural Health Resources Defense Council, says while the study/report was interesting, it fails to ask the underlying question, "Why are the bee colonies dying? Is it because they are getting weak? People who have HIV don't die of HIV, they die of other diseases because their immune systems are knocked off, making them more susceptible". In other words, pesticides could weaken the bees—and then the virus/fungus combination finishes them off. That notion, however, is not explored in the new study.

Studies in the US have shown that at low doses, the neonicotinoids have sublethal effects that impair bees' learning and memory. The USDA's chief researcher, Jeff Pettis, said that pesticides were definitely "on the list" as a primary stressor that could make bees more vulnerable to other factors, like pests and bacteria.

In 1999, France banned Imidacloprid after the death of a third of its honeybees. A subsequent report prepared for the agricultural ministry found that even tiny sublethal amounts could disorient bees, diminish their foraging activities, and thus endanger the entire colony. Other countries, including Italy, have banned certain neonicotinoids.

In June 2008 a district court judge defanged a lawsuit that North Dakota beekeepers brought against Bayer by siding with Bayer to exclude test results that found significant amounts of Imidacloprid in honeybee samples. The beekeepers tried to enlist more expert witnesses, but they declined in large part because they had taken research money from Bayer.

Bayer eventually agreed to appoint a beekeeper advisory board to help redesign studies so that beekeepers could trust the results. But many beekeepers see the advisory board and grant money as a ruse on Bayer's part to silence its enemies by holding them close. "Even the researchers are off working on anything but the pesticide issue. We are concerned that based on this recent report that beekeepers will use more pesticides trying to treat the viruses."

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Kim Flottum, Catch The Buzz
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Mite treatments: insight into how they work

By Frank Lindsay, NBA Life Member

Varroa has just about spread through most of the South Island. When you first come into contact with it, the question 'what do I do?' hits you even though you have attended seminars and field days.

It's not until you see varroa (often too late) that you have to decide what to do, and what treatment to use.

Points to consider

The first thing to understand is that these treatments were developed in Europe where most hives have a single brood chamber. Those who do not use queen excluders still have the same amount of brood in the hives but it could be in two supers. Hence only one treatment is required (two or four strips depending upon the product). I have heard of beekeepers putting in double the number of strips because they have brood in two supers. This only results in residues in the wax.

Second, Europe has a definite autumn and then a broodless winter. When the strips are put in, brood rearing is reducing, but this is not the case over most of New Zealand. Most will have some brood in their hives all winter. Hence it could take the full treatment time (eight weeks) to work effectively.

Third, bees don't like these strips. They are a chemical insecticide manufactured at a rate to kill mites but not bees. The difference is very slight so they will try and move away from them.

Placement of the strips is therefore important. Place them against a frame with brood so the bees have to make contact with the strips. Make sure there is room so bees are in contact with both sides of the strip. This might mean you have to part the frame slightly, rather than have the strip hang down one side against the side of the frame.

Fourth, you should re-adjust the position of the strips halfway through the treatment period. Four hives out of 100 will move the brood nest completely away from the strips. Unless you check the mite fall immediately after the completion of the treatment, the result is four or more dead hives.

> "... bear in mind that these are powerful insecticides, albeit at minute quantities. Rubber or neoprene gloves should be worn but then again, this precaution is not foolproof."

Finally, bear in mind that these are powerful insecticides, albeit at minute quantities. Rubber or neoprene gloves should be worn but then again, this precaution is not foolproof. Studies in the United States a while ago showed that the chemicals penetrated most surgical gloves within 10 minutes of contact. Apivar® recommends on its Canadian packets that *ONLY a maximum of 200 hives be treated per person per day.*

Selecting which chemicals to use

When making your selection of chemical family, be aware that Apistan® and Bayvarol® were designed to stop male reproduction, while Apivar® is designed to stop female reproduction. These chemicals, I believe, are the reason why queens no longer live for four years. Most of the time now you only get two years' production out of a queen, and sometimes only one year. You don't notice the effects visually on the bees from chemicals or low levels of varroa, as they can affect the bee's internal development—sperm in drones and egg development in queens.

Strip kill rates

When you put in Apistan® or Bayvarol®, the bees pick up the active ingredient and quickly spread it through the hive, resulting in an almost instant kill of all the varroa on the bees. If you use sticky boards and Apistan®, in the first 12 hours you will see 20–50 newly emerged bees stuck to the sticky boards, still alive. The chemical during the first few hours is strong enough to knock down newly emerged bees down but not kill them. After 12 hours you only see dead bees on the sticky boards (those that die in the hive) and thousands of mites. An example of just how the chemical is spread was told to me by an Auckland beekeeper trying to select bees for hygienic behaviour. He put 300 bees in a jar with an Apistan® strip to get an idea of the mite count in the hive. After an hour he put the bees back into the untreated hive and there was enough chemical picked up by the bees in the jar to kill most of the mites on the bees in the hive for the next day. Gives you an idea how bee-to-bee contact spreads these chemicals.

The only one that acts differently is Apivar®. In Europe, without brood the chemical will kill 98% of all mites in a hive within four weeks; with brood it's generally six weeks. However, the strip works differently. Only a little chemical is released through the strip each day. Day one will kill 50% of the mites on the bees. Day two and more is released and this then keeps killing mites. But if the humidity in the hive is high or it's a wet day, the active ingredient (amitraz) breaks down and is not effective. This is why the packets are made of aluminium foil and plastic and are packed under a vacuum.

In 2005, Dr Benoit Seifert visited New Zealand and spoke at a Waikato field day in response to complaints from New Zealand beekeepers that Apivar® wasn't working. Dr Seifert presented a graph that showed a gradual climb in mites kill from 50% to 85% over four weeks. When the strips were

repositioned, the kill went rapidly up to 93% and then gradually to 99%. Repositioning the strips is essential for a complete kill with this product. High amounts of brood in the hives could stretch the kill time out even further.

Timing of the insertion of strips is also important in two ways: (1) getting them in before mite numbers reach a critical peak, and (2) that all beekeepers in a given area should put strips in at the same time; otherwise a few hives left untreated or treated late could cause some reinvasion. When I say "a given area", this could be 15 kilometres, as drones fly that far to drone congregating areas.

You see reinvasion problems in the coastal or warm areas when bees fly during the winter. By June one or two hives are dead. By July, 50% of the hives in that and the surrounding hives are dead. Robbing bees can bring in 200 mites a day and at 1000 mites you start to see damage within a week or so.

As a side issue, Dr Mark Goodwin said that their record for mites in a hive at Plant and Food Research Ruakura (2005) was 70,000. That was in the early days before we got deformed wing virus, *Nosema ceranae* and now resistant mites. It's said that viruses are what kill the bees, not the number of mites. The higher the number of mites, the quicker the viruses are spread from adult bees to the larvae. The fewer mites there are in a hive, the better and more contented the bees are.

Therefore for those using Apivar®, hives should be well off the ground. They may need a little more top ventilation if the moisture content in the hive is above 55%, otherwise the chemical will not work as required.

Another thing to recognise is the visual signs of varroa outside the hive. When you see the odd misshaped pupa on the landing board or drones crawling away from a hive instead of flying (fully formed), the hive only needs another generation of mite reproduction and it will be dead; i.e., in two or three weeks' time.

[Editor's note: this is part 1 of a 2-part article. Part 2 will appear in the March issue, focusing on treating hives with organic varroa treatments.]

Drone removal

Stuart McEwen from the Hawke's Bay sent these photos to Frank Lindsay late last year, along with some commentary.

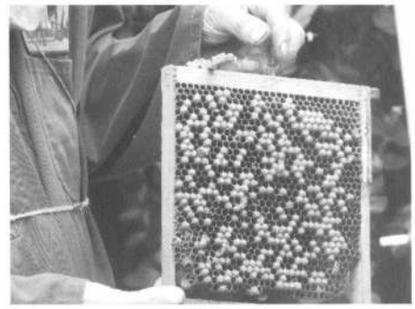
The photo at bottom right shows this frame with the bar on top, which allows it to hang in position. The other half frame in the brood box is normal worker brood and this stays in permanently (basically filling the gap).

Stuart also uses a lifter consisting of a vertical pole mounted on a stable base. A carriage fits on the pole and slides up and down by the winch on the top (note this winch is able to rotate on the pole). A metal band goes around the box to be lifted and is easily secured to the carriage. The photo at top right shows the supers lifted and turned to allow access to the brood box.

Boxes can also be lifted well up to fit another super under full honey supers or to fit bee escapes etc.

Frank Lindsay comments, "This is a simple method of reducing varroa levels in a hive but you can't miss a date, as the mite number will double with emerging drones.

You will also require a method to establish the mite loading of the hive so you know when to treat. This could be with a mesh floorboard (count the drop over 3–5 days and divide by the number of days to get the figure) or sugar shake, but the bees are best taken off the brood frames. (Put a second lot of sugar in after the first shake as not all mites are dislodged the first time.) Refer to the varroa manual *Control of Varroa* by Dr Mark Goodwin & Michelle Taylor."



Above: supers lifted and turned to allow access to the brood box. Below: showing the frame side on and showing the bar on top, which allows this frame to hang in position.

Stuart removing the half drone comb. Photos supplied by Stuart McEwen.

Bees reveal nature-nurture secrets

The nature-nurture debate is a "giant step" closer to being resolved after scientists studying bees documented how environmental inputs can modify our genetic hardware.

Indoor experimental hive at the Queensland Brain Institute, taken during the NBA Small Hive Beetle study group trip to Australia, May 2009. Photo: Sarah Peacey.

The researchers uncovered extensive molecular differences in the brains of worker bees and queen bees which develop along very different paths when put on different diets.

The research was led by Professor Ryszard Maleszka of The Australian National University's College of Medicine, Biology and Environment, working with colleagues from the German Cancer Institute in Heidelberg, Germany and is published in the online, open access journal *PLoS Biology*.

Their work reveals for the first time the intricacies of the environmentally-influenced chemical 'marking of DNA' called DNA methylation, which has the capacity to alter gene expression without affecting the genetic code—a process referred to as 'epigenetic', or above the genome.

"This marking determines which genes are to be fine-tuned in the brains of workers and queens to produce their extraordinarily different behaviours. This finding is not only crucial, but far reaching, because the enzymes that mark DNA in the bee are also the enzymes that mark DNA in human brains," said Professor Maleszka.

"In the bees, more than 550 genes are differentially marked between the brain of the queen and the brain of the worker, which contributes to their profound divergence in behaviour. This study provides the first documentation of extensive molecular differences that may allow honey bees to generate different reproductive and behavioural outcomes as a result of differential feeding with royal jelly."

Professor Maleszka said that the work goes a long way to answering one of life's biggest questions.

"This study represents a giant step towards answering one of the big questions in the nature-nurture debate, because it shows how the outside world is linked to DNA via diet, and how environmental inputs can transiently modify our genetic hardware," he said.

"Similar studies are impossible to do on human brains, so the humble honey bees are the pioneers in this fascinating area."

Source

Public Library of Science (2010, November 3). Bees reveal nature-nurture secrets: Extensive molecular differences in brains of workers and queen. *ScienceDaily*. Retrieved November 18, 2010, from http://www.sciencedaily.com/releases/2010/11/101102171606.htm

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Journal Reference

Frank Lyko, Sylvain Foret, Robert Kucharski, Stephan Wolf, Cassandra Falckenhayn, Ryszard Maleszka. The Honey Bee Epigenomes: Differential Methylation of Brain DNA in Queens and Workers. *PLoS Biology*, 2010; 8 (11): e1000506 DOI: 10.1371/journal.pbio.1000506

Control of Varroa: A Guide for New Zealand Beekeepers by Mark Goodwin and Michelle Taylor, and *Elimination of American Foulbrood Disease without the use of Drugs: A practical manual for beekeepers* (revised edition) by Mark Goodwin, can be purchased from the NBA. Please contact Jess on secretary@nba.org.nz or 04 471 6254 to order a copy.

Honey bee brains lead to big ideas

By Dr Oksana Borowik

Honey bees attracted some big brains to the Third Annual Southern Hemisphere Bee Fest Symposium, held on 2–3 December, 2010.

Scientists gathered at the University of Auckland to present the latest research on various aspects of honey bee biology. Over two days, the scientists heard incredible new research on honey bee development, navigation, genetics and behaviour.

Though it won't cure varroa or increase honey production just yet, this research reinforces the special nature of honey bees. Here are some research highlights from the symposium.

The keynote speaker was Dr Susan Farbach from Wake Forest University in the US. Susan described her research into learning in honey bees and how it affects brain structure. She showed that bees that have learnt certain behaviours had larger and more complex brains than those that had not.

Tiny transponders attached to honey bees astonished the audience. Dr James Cheeseman of the University of Auckland uses honey bees' time sense and sun compass navigation as tools to investigate the effects of anaesthesia. To follow their flight paths, he attaches tiny radar transponders to the honey bees. Using this technology he can follow their exact flight paths over kilometres to and from the hive. His research has shown that bees' time perception is altered by anaesthesia. General anaesthesia is thought to have similar effects on humans.

RFID tagged bee. Photo: Ian McDonald, University of Auckland.

Rebecca Norris also takes advantage of the latest advances to follow honey bee activity. A student in Dr Guy Warman and Dr Craig Millar's lab at the University of Auckland, she uses tiny tags called RFID technology to track individual bees as they enter or leave the hive. Her research shows that carbon dioxide (CO_2) is an important factor that regulates honey bee development. Rebecca showed that high levels of CO_2 can influence the age at which worker bees perform different tasks. Her results suggested that high levels of CO_2 make worker bees forage sooner than normal.

Dr Craig Millar, Dr Oksana Borowik, Dr Mark Goodwin and Dr Guy Warman. Photo: Kate Lomas.

The stresses on honey bees today have never been greater and as colony collapse disorder still mystifies scientists, Dr Andrew Barron of Macquarie University in Australia studies how honey bee colonies fail when under stress. Modelling the process of colony failure, he showed that a hive with 10% mortality is sustainable, but as soon as the critical threshold reaches 35–38% mortality the hive will collapse in 50 days. As the colony starts the process of collapsing, hive bees that are forced to forage earlier are less effective, furthering the stresses on the colony.

Honey bees also feature prominently in the field of epigenetics—the study of how factors other than genes influence what you look like and how you behave. Dr Ryszard Maleszka from the Australian National University investigates how the interaction between genes and the environment influence behaviour in honey bees. As workers and queens are genetically identical, it is a special compound in the royal jelly that modifies the genes to produce a queen.

Rebecca Norris showing the RFID technology used to track individual bees as they leave and enter the hive. Photo: Oksana Borowik.

Our very own Dr Mark Goodwin of Plant and Food Research at Ruakura discussed his work on how honey bees prepare in-hive for pollen and nectar gathering. Much research worldwide has been done on nectar gathering but not on pollen gathering—knowledge that could help the pollination industry. Mark has shown that honey bee foragers must pre-plan and assess how much nectar they need to take from the hive for flight and packing before leaving to collect pollen.

The scientists attending the Bee Fest also spent time discussing a wide range of honey bee topics—hopefully hatching new ideas we will hear about at next year's symposium. A highly successful and stimulating gathering! Thanks go to symposium organizers Dr Guy Warman, Dr James Cheeseman, and Dr Craig Millar.

Conference dinner at the Harbourside Seafood Bar and Grill. Photo: James Cheeseman, Auckland University.

Warmer than normal conditions likely

The equatorial Pacific remains in a strong La Niña state, which is expected to persist into the start of autumn 2011, says the NIWA National Climate Centre.

Beyond this time, there is disagreement between the forecast models as to whether La Niña will continue into winter at a weaker level, or whether a transition to neutral conditions will occur.

Early autumn temperatures (February to April) are likely to be above average in all regions, except in the east of the both Islands where average or above average temperatures are equally likely.

Seasonal rainfall is likely to be normal or above normal in all North Island regions, and near normal in all South Island regions. Soil moisture levels and river flows during February–April are likely to be above normal in all North Island regions, normal or below normal on the east coast of the South Island, and near normal elsewhere in the South Island.

The seasonal outlook states that mean sea level pressures are likely to be below normal to the north of New Zealand, with weaker westerlies across the country.

Tropical cyclone activity is likely to be near- or above-normal this season (through to May 2011). The risk of an ex-tropical cyclone passing close to New Zealand is slightly above the long-term average. On average, at least one ex-tropical cyclone passes within 500km of New Zealand in 9 out of 10 cyclone seasons.

Overall picture

Temperature: On average for early autumn (February-April), temperatures are likely to be above average in all regions, except in the east of the North Island and the east of the South Island where average or above average temperatures are equally likely. Sea surface temperatures are presently slightly above normal around the North Island, and over the coming three months are expected to warm further above the normal for this time of year.

Rainfall, soil moisture, and stream flows: The National Climate Centre says that the expected lower pressures to the north of the country are likely to result in early autumn seasonal rainfall being normal or above normal across the North Island. Soil moisture levels and river flows are also likely to be above normal in all North Island regions. For the South Island, rainfall is likely to be near normal in all regions, whereas soil moisture levels and river flows are likely to be normal or below normal on the east coast of the South Island, and near normal elsewhere.

Dealing with ants and wax moth

I have about 80 hives and growing. Every season I get a few in each yard with a million ants in between the lid and inner cover.

I kill them and when I return they are still there. What to do? I am worried that if I poison them the poison will somehow find its way into the hive or leave a residue in the honey.

Answer: I don't like these ants either. Ants don't like damp conditions. Squash as many as you can and then place a handful of fresh grass under the lid. Another alternative is to use fresh or even dried walnut leaves.

Another beekeeper has found that hives with ants had less varroa, perhaps because of the oxalic acid they release when disturbed, so they might yet be useful—who knows.

Be careful that you do not transport any ants back to your home. They seem to breed without a queen and they are hard to get rid of.

What shall I do about my stored boxes in the winter: no matter where I put them, they get wax moth. I have been thinking about using mothballs as they are mainly made up of natural things? Has anyone tried it and are there any residues, etc?

Answer: Everything has its place. Wax moths are useful for cleaning out the combs of dead feral colonies, especially if it was diseased; however, in the wrong place they are a costly nuisance. Actually wax moths are marvellous things. The larvae of the greater wax moth form balls of wax and are able to generate heat, so once established they keep breeding even when it's cold.

Storing supers is important. There's a lot of money and bees' energy stored in honey supers so it pays to look after them. Don't use mothballs—they leave a toxic residue in the wax.

Try and leave the supers on the hives as long as possible; i.e., extract the honey then return the supers to the hives to be cleaned out. After the first frost, remove the supers and store them away. While on the hive the bees will look after any wax moth eggs that hatch in the frames.

Wax moths don't like light, draughty or cold conditions. I store a lot of my supers in an old milk room on a dairy farm. It has no doors and is open to the old herringbone milking bales and the docking bay. The room faces south; it's cool during the summer and has ventilation ports every couple of metres around the bottom of the walls. I store my supers on pallets, so they are off the floor with queen excluders top and bottom to keep out mice. Because it's cool and there is airflow through the supers, I don't get wax moth eggs hatching.

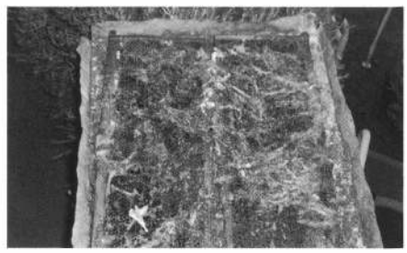
An alternative would be to use an open shed (three walls) with a slatted stand about 300 cm off the floor. This will give a good airflow and restrict the hiding places of mice and rats. Put baits in plastic bottles with open necks big enough for a rat's head to get in or use proper bait stations. The rats will go to these first instead of the supers. If you have an open shed, the supers can be removed for storage a lot earlier.

Before putting the supers away, sort the frames. Remove all that have pollen in them and store them separately. Wax moth love pollen to feed on, so these should be stored where they can easily be checked every two months. With a bit of luck you will get pollen mites in the pollen. The mites will eat out the packed pollen, turning it into loose grains again and making it easy for the bees to remove.

Next they like darkish frames (those that have produced brood), so put these in the centre of the super with light frames or foundation frames between them. Any dark frames you can't see light through when held up to the sun should be rejected and melted down to recover the wax, or just used for the winter fire (these should have been discarded during extraction).

Stack the supers 8–10 high depending upon the height of the roof (have plenty of head room for good air movement). With rodents controlled, you can offset each super slightly (front and back so that they have a greater airflow), but this requires more room. An alternative is to stack the supers on their ends with the frames exposed but if you have a lot of supers, mice can get in them and they cause just as much damage and fouling of frames as wax moth.

Another alternative is to purchase a refrigerated shipping container with a good door seal (one you hear the air coming out when you close the door). Take the temperature down to minus 15°C for 24 hours and that should kill everything in the container. (We'll all need these when we get small hive beetle.) If you don't have a freezer unit, then stack all the supers in and get a registered fumigator to gas the container with either carbon dioxide or if you have a bad infestation, methyl bromide. Methyl bromide is not very environmentally friendly but it's the only substance registered for this purpose. It doesn't take much methyl bromide to kill wax moth (10 grams per cubic metre if my memory is correct) and the residue is gone after three weeks. Provided the container remains sealed until winter, you shouldn't get a re-infestation. Open the doors and allow the container to air for half an hour before entering. Even after a long time there could still be a pocket of gas.



Wax moth. Photo: Ron Morison.

Do you have a burning question about beekeeping? Are you worried about your beeswax? Mystified about moths moving in? Well fear not, help is at hand. Every keen beekeeper has a list of questions they'd love to know the answers to. Luckily, the NBA has our local beekeeping brainboxes (Frank Lindsay for this issue) on hand to answer any beekeeping related queries from giving your hives a helping hand to sussing out your swarms.

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FROM THE COLONIES

Auckland Branch

Auckland Conference is hot on our agenda. I am writing to you from Texas, USA at the combined North American Beekeeping Conference and Tradeshow, a joint effort of the American Beekeeping Federation, American Honey Producers Association and the Canadian Honey Council. I am busy researching how we can bring you the best and latest global honey bee information!

The North American conference has an excellent project whereby the industry sponsors the Honey Queen and her runner-up Princess for a year (through raffles, auctions of honey from the Honey Show and other items like bee-related paintings, antiques, jewellery and donations) to travel America promoting beekeeping and bee health. The Honey Queens are sponsored from each U.S. state and go forward to a national competition at conference, which involves beekeeping knowledge quizzes, speeches and presentations over the week as they interact with delegates and schoolchildren that join conference for a morning of bee education.

The Honey Queens give presentations, cooking demonstrations and recipe handouts, club speeches, media interviews, school visits, Country A & P type shows, etc., aimed at educating and promoting the industry.

The American Honey industry is also helped with levies on all honey sales local and IMPORTED, which fund a government Honey Board which has an annual budget of over $2 million USD to spend on marketing American honey. In addition, a further $250,000–500,000 goes annually to honey and bee research from that fund.

NBA Conference

Our conference committee is dedicated to presenting the hottest program yet and can promise you a great week. Put 26–30 June in your diaries now.

Now don't forget the honey competition: put aside your best comb frames, full frames, sections or cut comb. Rules and regs can be found on the NBA website. And keep snapping those magical moments for the photo competition. We are looking for a fabulous array of 'sweet shots'. You will find a box with information on photo categories and judging criteria on page 24.

Enjoy the sunshine, honey flow and the wonders of nature everyday. I look forward to sharing my enthusiasm for our industry at conference.

- Maureen Maxwell,
Northern Ward representative

Waikato/King Country

Last year in the greater King Country, beekeepers fielded many calls from irate members of the public about bees being left free flying at truck stops, petrol stations etc. This year is no different. Bees coming off loads are considered to be insecure loading by the police. Beekeepers are now recommending for the public to follow up with the police.

Moving bees at night: if you need to fill up with diesel find a truck stop, stop your truck outside the range of the lights of the area, walk and get your card information going, unhitch the gas nozzle and lean against the pump, go back and get your truck, drive forward, fill and move out. The less bees are exposed to light, the better. Some truck stop lights have a sensor for coming on; fill just outside the sensor range if you can. Keep a range of different fuel cards if you change areas. Keep your truck idling if you have to stop anywhere; the bees have got used to the vibration, if you turn it off they will be more included to come out and fly.

It's also supering time, and ironically robbing time at the moment in some areas. Use hive mats/tarps or escape boards to cover your load—when you load in the morning, you are in the yard, then you will not get bees in or out of your boxes and not cart them with you.

- Fiona O'Brien

I have managed to set-up a new arm of my beekeeping business, charging oil companies to clean up the bees at truck stops. First job was this morning, cleaning up after a truck load of bees filled up with diesel at the Brixton Shell truck stop yesterday morning. The car dealer and mechanic, both working from the same site have lost customers as they could not get out of cars, not forgetting the diesel sales lost. The truck and hives were a smokey green colour. The load was not covered. I am sure that the oil company won't like being charged and will be looking to recover costs.

- Stephen Black

[Editor's note: abridged from posts to NZBkprs Digest, Vol 68, Issue 2, 26.1.11]

Hawke's Bay Branch

Some parts of the Bay are reasonably green but large areas are rapidly turning to desert. Honey crops have been mixed but generally are very poor, and unless something changes drastically over the next month, I would expect this to be one of the worst seasons for a while. Still there is some honey coming in: don't forget to save some of it for the honey competition at this year's conference.

Three people including me attended the artificial insemination (AI) course at Ruakura. This was certainly a full-on, amazing time with great teaching from Susan Cobey and a lot of support from the team at Ruakura. I think I could now AI a few queens successfully but only time will tell. It sure isn't easy.

- John Berry, Branch President

Nelson Branch

Over the past month the top of the South has had a real battering, first with drought followed by flooding and gale-force winds. Luckily we only had one hive knocked over by a fallen tree but others haven't been so lucky, with some hives lost in floods.

There was an early crop of honeydew and kamahi but since then it's not been so good, with lots of wind and rain putting a stop to the manuka flowering almost as soon as it had begun.

After the traditional Christmas weather bomb it looks like a settled period in which we all hope to finally get some honey in the supers. There should be a good crop of clover now that we've got some moisture back in the soil and maybe the kanuka will finally decide to flower, although it's not looking too promising just yet.

For us it's just a case of doing the rounds and putting stickies on anything that looks like it needs it and taking boxes off those that don't, while also enjoying a few days off to leave the bees to get on with it.

- Gareth Ayers

Mesh screen hive floors

By Paul Brown
Auckland Beekeepers' Club, paul@ww.co.nz

This article covers the various types of hive floors I have trialled and ends with the model I currently favour.

Like many beekeepers, I have tried different hive set-ups. The 'top bar hive' is being promoted as a 'natural, bee friendly' set-up—sort of reinventing the wheel I feel. In nature bees don't have a floor as such: they progress upward in winter and build and repair downward in spring, and maybe build comb outside the 'hive' after Christmas.

The two full-depth (fd) brood box on a solid floor

Many years ago during winter I supported the floor on a 240-mm stand to reduce the amount of beekeeper bending required. About November, I reduced the checking of the bottom box, so removed the 240-mm stand to just 100 x 50 bearers on each side of the floor. After listening to a speaker at the NBA conference at Auckland, some years back, I changed to just one fd brood box and found that this hive set-up was easier and quicker to manage. The colony had plenty of space and the combs were clean and better utilised, but often not drawn down completely to the bottom bar.

A 'no-floor' hive

I next tried the 'no floor' hive, by standing the brood box on four 200-mm upturned plant pots. The bees came from all sides: that was OK until spring when the bees built comb downward and didn't go up through the queen excluder (qx). So some 'floor' is a help to the beekeeper.

The shade cloth floor

This floor had a piece of shade cloth that could be pulled tight to stop the bees building downward under the open floor beneath the brood box. This forced the bees up through the qx and up into the honey box(es). This worked OK but the bees chewed through the shade cloth: heavy propolis matting would have been better as it was removable and all the mites etc. could fall to the ground and be naturally recycled. Some keen beekeeper may like to further trial a moveable 'screen floor'.

The stainless steel mesh screen floor

I got really interested in counting natural mite fall (nmf) and put data on the NZBkprs email list. A very helpful New Zealand (Dutch) beekeeper sent me a photo of a floor of high-density foam with stainless steel mesh about 60 mm below, popular in Holland, so I made one out of wood and glued and stapled a stainless steel mesh screen on the underside of the floor. The bees had a 50+10mm 'cluster' space and the 45-degree slope encouraged the bees to keep the mesh clean. The entrance was 20 x 365, which I feel is too big with a screen floor for ventilation. The bees landed on a 50 mm front strip then had to walk to the hive sides to get up on to the frames, so I glued on a ramp so the bees could walk in, go up the ramp and directly on to the frame. It also deterred wasps, which prefer to go down when entering.

In spring the bees will build comb right down to the bottom bar of the frame, and then perhaps some burr drone comb under the bottom bar, but this stops once the swarming urge is over. The returning field bees have a cluster space and keep the brood warm right down to the bottom bar, so all the cells are available for brood raising. It seems to reduce the amount of drone comb for the queen to lay in, which perhaps excites swarming in a spring colony.

Stainless steel mesh is expensive and Ceracell would cut me metre after metre of the stuff. A 1000-mm section cut into three is 333 so with two 50-mm sides, and a 405-mm floor width (405-100=305), it could be covered by the 333. Lengthwise, a 450-mm with a landing and a rear worked out fine.

A 50 x 50 mm ruled corflute counting board can go under the floor to do your nmf monitoring counts. (Cooking oil makes a mess: just handle the corflute carefully and wipe it clean for reuse.)

The corflute can be 'jammed' tightly up under the floor, to prevent formic acid gas escaping when a fuming for mites is required.

The bees walk up the ramp and on to the bottom of the frame. Photo: Paul Walsh.

Bee president bikes the world

By Martin Gibson, *The Gisborne Herald*, 10 January 2010

As president of the International Federation of Beekeepers' Associations Frenchman Gilles Ratia works with about 7 million beekeepers in 80 countries, and has taken a "beekeeping field trip" that has taken in 114 countries.

About seven years ago he tired of planes, and started motorcycling around the world for six months each year. He and his motorbike have travelled 105,000 kilometres through 40 countries.

With the exception of the former Soviet state of Georgia, ("They drink too much bad vodka then race big four-wheel drives") the trip has been wonderful, says Mr Ratia.

"The rest of the trip was pure happiness – even in Iran, Pakistan . . . lovely people, very hospitable and friendly.

"If you watch the news every night it is like a little drop of propaganda and after years you believe the world is very terrible, awful, full of terrorists and things like this but it is not true. Most people want to live in peace with their family like you and me.

"You just have 2 percent of politicians, ammunition and petrochemical companies doing nasty things.

"In Iran 99 percent of people say their president is crazy for wanting nuclear weapons. They don't want it, but on the news you see in Tehran crazy people paid by the government burning flags and shouting.

"If the journalist with the camera were fair enough to do a 360 degrees you would see schools, shopping malls, ordinary people and here, in 10 degrees a small group of people shouting and screaming.

"It's propaganda – 'look they are doing nasty things!' They have lots of petrol, we are jealous."

Like a bee going from flower to flower he goes from country to country collecting information about the different bees flowers, honeys, management, markets and giving lectures and training national beekeeping associations.

He arrived in Gisborne on Friday to spend some time with Gisborne beekeeper Barry Foster who is vice president of the New Zealand Beekeeping [Beekeepers'] Association.

Bees are dying at a rate of up to 40 percent of colonies per year in countries with industrialized agriculture, and Mr Ratia believes the blame lies with neonicotinoids, a systemic insecticide widely used in this region.

> "Bees are dying at a rate of up to 40 percent of colonies per year in countries with industrialized agriculture, and Mr Ratia believes the blame lies with neonicotinoids ..."

"The normal death rate is 5–10 percent, but now around the world it is between 30–40 percent. Imagine a man with a thousand cows and ever[y] year 400 cows, poof! Something is wrong."

During the first and second world wars, chemical companies invented very strong chemicals to kill soldiers, and after the war they want a market for their very strong products, he says.

"Thanks to these heavy chemical products farmers can have thousands of hectares in monoculture. It's completely crazy, and also for irrigation it is also not sustainable.

When the International Federation of Beekeepers' Associations president Gilles Ratia was 20 he bought a Volkswagen camper and spent one year in Africa, then he bought a sailing boat and crossed the Atlantic Ocean twice. When he assumed the role of overseeing the national beekeeping associations of 80 countries he decided it was better to do the work on a motorbike rather than on planes. Photo: Rebecca Grunwell, The Gisborne Herald.

They have something to sell so they don't want organics, and we are going straight to the wall."

Modern pesticides are 7000 times more toxic than DDT and used to treat seeds to coat the whole plant.

"It is systemic, so its whole life the plant is protected for the farmer, but polluted for the beekeepers because the nectar, the pollen, the sugar exudates etc all have this very toxic chemicals."

Bayer has taken the three presidents of France's beekeeping associations to court for "saying nasty things about their nice chemical products", he says.

"They didn't win, but they also took France's previous Minister of Agriculture to court, who had banned one of their products which is harmful to bees. Now they have a minister who is more supportive of them and overturned the previous law."

Continued on page 23

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Mr Ratia is frustrated at the refusal by chemical companies will not accept that they are causing massive harm to the world's ecosystem.

"They say – 'Ah it's not possible! We spend millions on R&D'. When they spend millions on R&D they expect billions back for it, because they are there to make profits.

"I have met many of the people at the head of these companies – they are very honest – they really believe in what they do.

"There will be eight years research into a single molecule, at a cost of tens of millions of dollars. Then the chemical companies who developed them run the tests, but they are so narrow, and so biased to getting these chemicals they have spent so much to develop to market.

"Consumer organizations and independent researchers are not allowed to see their results. They are judge, jury and executioner – 'We are the judge, close your mouth, everything is okay, game over, don't discuss'.

"Is that democratic? It is how it works at the moment."

Honey is only a fraction of the benefit humans get from pollinators, which are directly needed for 35 percent of the world food supply, says Mr Ratia.

"The bees are saying something to us: 'Look Homosapiens, you are doing something wrong with nature. If we are dying something is polluted; your water, your vegetables, be careful.

"The immunity of the bees is very low and they don't have a high capacity of resilience. If they have too much stress, like these chemicals, or being transported 20,000km per year in the US. Lots of artificial foods, like isoglucose between nectar flows. Lots of vetenery [veterinary] drugs, and pollen with neonicotinides, climate change . . . they can't handle it all and they collapse.

"We have some studies in France that were done by insurance companies for agricultural workers. They studies [studied] brain tumors and expressed concern about the neurotoxic properties of neonicotinides.

"There is a lot of lobbying from the chemical companies – saying it is not possible to feed humanity without all these chemicals. It is a pure fallacy, a pure lie."

Gilles Ratia in Auckland

By Maureen Maxwell, Northern Ward representative

Gilles Ratia also visited Auckland as part of his holiday visit to New Zealand. I persuaded him to give a presentation to Auckland beekeepers on 2 December on possible factors in colony losses.

Auckland Beekeepers' Club member Gary Fawcett has posted a blog that includes a link to Gilles' presentation: see http://wp.me/pFU5c-eY

Photo: Maureen Maxwell.

Gilles is a very interesting, entertaining and knowledgeable speaker. The photo below shows Gilles and his wife Josephine leaving my home to continue their journey aboard their bike, Gazelle.

More about Gilles

Gilles is an international beekeeping consultant with projects in 90 countries. He started beekeeping in the 1970s and was a commercial beekeeper and queen breeder, living off 500 hives.

He is owner and webmaster of www.beekeeping.com, the world's #1 beekeeping portal in four languages, which has 7000 members and over 400,000 visitors every month.
Check out www.worldbees.com for more information on Gilles' extraordinary world bee tour. He has the most amazing images of global apiaries.

Apimondia

The International Federation of Beekeepers' Associations might be better known to beekeepers as Apimondia.

Apimondia has 80 member countries and represents seven million beekeepers worldwide. It coordinates a congress every two years, which is well worth putting on your beekeeper's diary. The next congress will be held in Buenos Aires, Argentina, from 21–25 September 2011. Go to www.apimondia2011.com for more information.

April issue deadlines

The April issue of *The New Zealand BeeKeeper* goes to all registered beekeepers in New Zealand. The deadline for articles and advertising is 7 March 2011.

Material received after 15 March may not be published.

See page 3 for further information and contact details.

ECROYD BEEKEEPING SUPPLIES

Photography Competition at 2011 NBA Conference

Class A. Close-up print. Subject must relate to beekeeping.
Class B. Scenic print. Apiary subject such as flowers, hives etc.
Class C. Portrait print. Person, beekeeping procedure, honey or hive by-product processing in appropriate setting.
Class D. Essay prints. A set of from 4 to 7 pictures depicting a beekeeping story.

1. The photo contest is open to all registered NBA members.
2. Prints in Classes A, B and C must be 10 x 8 inches or larger, mounted on a mounting board that extends at least one inch beyond the print on each side. No frames are permitted.
   Essay prints must be 5 x 7 inches or larger and may be mounted on one mounting board.
3. Prints may be in black and white or colour
4. Photographs can be entered only once in any NBA show.
5. Each photograph, including the Essay as a set, must be accompanied by a 3" x 5" card giving the photo title, entrant's name, address, postcode and telephone number. The card must state the class entered.
6. A brief caption may accompany the Essay photographs. The order of the Essay photographs must be indicated clearly.
7. Winners must agree to have their photos published in The New Zealand BeeKeeper journal in any/all appropriate publications.

Judging Criteria

Classes A to D	Max Points
1. Composition	35
2. Treatment of subject matter	35
3. Quality and presentation	30
TOTAL	100

The peoples' vote will be by the number of votes cast and will cover all classes.

A good time to requeen

By Frank Lindsay, NBA Life Member

Starting with a warm spring where the bees built well, it was looking to be a productive honey season.

I controlled swarming well in most of my hives, but one area caught me out. It's usually a couple of weeks behind the northern apiaries, but it built up earlier this year and half the hives swarmed. Luckily I had split all the strong ones so could make up the odd hive that failed to requeen.

Then came a marvellous kamahi flow, short and sharp, the bees taking full advantage of it, bringing in two to three supers per hive. Usually the kamahi goes on for ages, meaning that it overlaps with the manuka. At this time the blackberry was in full flower so the bees swapped to this source. As the blackberry was tailing off, on came the manuka flowering.

From what pointed to be a one-in-five-year honey flow turned into a bit of a fizzer for the manuka. A week of humid misty weather and a couple of days of heavy rain (in which we received half our month's rainfall) put the manuka into a growth spurt, and even though it had a good flowering, there wasn't any nectar in the flowers even after it warmed up again. Bees could be seen going from flower to flower but were barely staying for a second before moving on again.

However, the hives on pohutukawa have done well, although not all trees flowered this year as that rain kept them growing.

To top it all off, we had 172 kph per hour wind gusts during Christmas, and on average three hives in half of my apiaries tipped over. Those in the manuka had their honey robbed out, indicating there hadn't been a flow on. Those on the pohutukawa were making brace comb in the space left by the squashed-up frames.

As I write this (early January) clover is coming away, pennyroyal is starting to make a show in the wetter areas (it's early), as is lotus major. Along the railway lines, fennel is in full flower and the odd whiteywood bush is still flowering, so perhaps it's not all over yet.

Making splits and requeening

As I remove honey in February, I inspect my hives for disease, assess the queen's laying pattern and put in strips to control varroa. After a week or two, the strips' initial potency is reduced, so I can put in protected queen cells into all those hives that I have assessed need new queens.

> "While a small flow is on (nectar coming in) it's easy to requeen a hive."

Most commercial beekeepers purchase queen cells or mated queens and replace all queens, so that they go into the winter/new season with hives headed by young queens that are unlikely to swarm. However, I want to maintain some genetic diversity in my bees, so like to raise queens from hives that naturally supersede or are headed by two queens.

While a small flow is on (nectar coming in) it's easy to requeen a hive. If protected cells are used, there is no need to find the old queen, making it easy to pop in a queen cell into the second or third super against a frame with brood in it. You can put them further up in the hive if the honey flow is still on, but you take a risk of the queen cell not being kept warm by the bees.

February is also a good time to make splits to either get queens mated or to introduce mated queens into a hive. It's always risky to dequeen a strong hive at this time of the year and immediately introduce a mated caged queen. Older bees know their queen and will ball an intruder; hence it's best to introduce mated queens into nucs.

Once the new queen has been laying for four weeks, it's possible to pick up the old queen and put her in the nuc while putting the new queen directly into the strong hive, provided you place both queens on the face of the frames they both were removed from. (Refer to *Breeding Super Bees* by Steve Taber.)

Make up nucs to carry through the winter as replacements or for an increase. Reading comments on the Bee-List, it doesn't make much difference as to the size of nuc you make (half frame, four full frames or bigger). The important thing is to make sure you have plenty of bees in them going into winter. Those hives that fill the chamber with bees will come through the winter.

A piece of aluminium foil covering most of the top bars will also help these small colonies to maintain heat through the winter. All you have to do to these during winter is change the odd outside frame with another of honey.

Things to do this month

Clean and sanitize the extracting plant. Check that all gates and taps are closed (honey is very silent when it's flowing on the floor). Check for AFB. Remove the honey (in damp areas, check the moisture content before extracting: some may need to dry their honey for a day or two with a dehumidifier to get it down to 18%). Extract honey, and super again with extracted frames. Requeen with cells or make up nucs from non-producing hives. Check that the hives have sufficient stores (a super of honey—sometimes they will convert this into bees before winter if there is a slight flow on).

Remove comb honey early to prevent travel staining (bees have dirty feet). Close down entrances as soon as the flow finishes to assist the bees to defend their hives from robber bees and wasps. Monitor mite fall or check the number of mites in drone brood. Coordinate treatment times with all beekeepers in the area.

The Bee-friendly Beekeeper

Reviewed by Stuart Handley

David Heaf, a beekeeper based in Northern Wales, has collected data, obtained knowledge, utilised previous published information and collated it in his book *The Bee-friendly Beekeeper: a sustainable approach.*

The book focuses on the bees' needs: shelter, seclusion and sustenance and principally the use of the Warré hive.

The adaptation of these needs into a form whereby a beekeeper can gather honey, not by invasive techniques involving harsh harmful chemicals or intensive hive manipulation, but in a more bee-friendly way, is the essence of his book.

Heaf describes his book as intended primarily for beekeepers and would-be beekeepers and not intended to be a manual on beekeeping. The principles involved in the book are not new by any means and are based on Abbé Émile Warré's 'People's hive'.

Abbé Émile Warré developed the Warré hive over 50 years of research. He studied over 300 hive designs, finally settling in the early 1950s on a now well-proven design.

The book is 160 pages long with colour photos throughout. I was pleasantly pleased to find a chapter with extensive drawings on how to build a Warré hive, along with other helpful ideas.

Throughout the book, references and acknowledgements are extensively used to other published work available; this theme is very helpful to the reader wanting to investigate more intensively various thoughts, ideas or facts that Heaf has mentioned. This referencing provides us with a degree of comfort that various other organisations, scientific journals and beekeepers have adopted, trialled and proven the methods of Abbé Warré. Heaf's book also saves many hours of surfing the net to find articles on the Warré hive, as numerous website addresses are given for the computer savvy.

The Warré hive focuses on simplicity of use, limited inspections, minimal intervention and the use of the natural qualities of comb building and the retention of nest scent and heat.

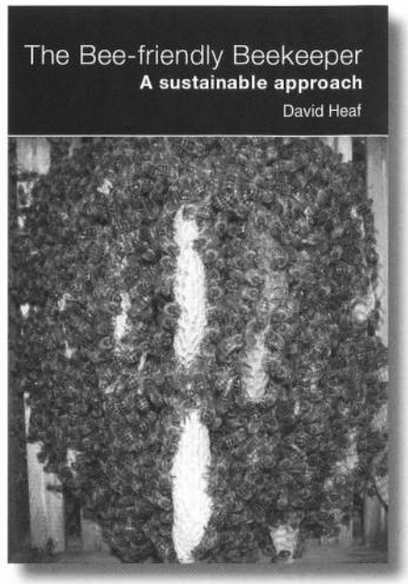
The bees build their comb on a simple top bar frame (a modification can be used, in countries like New Zealand, where the frame has to be removed for inspection by law, whereby 90-cm side bars are included). It was discovered that if the bees were left to their natural comb building, they attached only the top side portion of the comb to the side wall of the hive.

The Warré hive also does not super in the usual way of the Langstroth hive; instead, extra boxes are introduced to the bottom of the hive. This practice is known as nadiring.

The frames do not incorporate foundation, thereby avoiding any contaminated wax from another hive. Having no foundation allows the bees to build their own sized cells rather than manipulating them to a certain size cell only.

Chapters in the book, including a preface, prologue, introduction, along with appendices, acknowledgements, glossary and references include: keeping bees sustainably, fundamental attitudes of beekeepers, shelter, comb, seclusion, sustenance, diseases and pests, breeding and making increase, the People's Hive of Abbé Emile Warré and Warré hive modification and modern management tips.

In conclusion, this book and its principles won't be for all, as the Langstroth hive has been at the forefront of New Zealand beekeeping for many years. Yet this is a very thought-provoking book. Principles such as using formic acid (which is already present in the hive) or other natural acaricides for the control of varroa to avoid contamination of the wax to minimal hive inspections, may have a cost benefit to large-scale beekeepers.



I would recommend reading this book. It will raise some very interesting questions in your mind about the future of beekeeping not only in New Zealand, but in the rest of the world.

Publishing information

The Bee-friendly Beekeeper: a sustainable approach
By David Heaf. Published in paperback 2010 in the United Kingdom by Northern Bee Books, Scout Bottom Farm, Mytholmroyd, West Yorkshire HX7 5JS. **ISBN 978-1-904846-60-4**

Editor's notes

This book is available in New Zealand from http://www.koanga.org.nz/shop/books-and-dvds/bee-friendly-beekeeper-sustainable-approach.

For more information on the Warré hive, go to http://warre.biobees.com, or read David Heaf's article, 'Sustainable and bee-friendly beekeeping', in the April 2008 issue of *The New Zealand BeeKeeper.* David Heaf is contactable by email via http://www.bee-friendly.co.uk

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