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NATIONAL BEEKEEPERS' ASSN OF NZ (Inc.) EXECUTIVE COUNCIL

Lower South Island Ward
Frans Laas (President)
Wildlife Solutions Ltd
102 Gladstone Road
Mosgiel 9007
Ph: 03 489 4597
Email: f-laas@xtra.co.nz

Southern North Island Ward
R Neil Farrer (Vice President)
7 Nixon Street
Wanganui 4500
Ph: 06 343 6248
Mobile: 027 457 9634
Email: farrer@infogen.net.nz

Northern Ward
Maureen Maxwell
BeesOnline Ltd
791 State Highway 16, Waimauku
Auckland 0883
Ph: 09 411 7953
Fax: 09 411 5216
Email: maureen@beesonline.co.nz

Waikato Ward
Lewis Olsen
260 Ryburn Rd
R.D.3
Ohaupo 2452
Ph: 07 823 6706
Email: lewis.olsen@clear.net.nz

Bay of Plenty Ward
Neil Mossop
Mossop's Honey
1064 State Highway 29
RD 1, Tauranga 3171
Ph: 07 543 0971
Email: info@mossopshoney.co.nz

East Coast Ward
Barry Foster
Tawari Apiaries Ltd
695 Aberdeen Road
Gisborne 4041
Ph: 06 867 4591
Fax: 06 867 4508
Mobile: 027 449 7131
Email: bjfoster@xtra.co.nz

Upper South Island Ward
Glenn Kelly
Motueka Apiaries
PO Box 421
Motueka 7143
Ph/Fax: 03 528 8174
Mobile: 021 159 8483
Email: nzhoneys@yahoo.com

Central South Island Ward
Trevor Corbett
PO Box 20
Waipara, North Canterbury 7447
Ph: 027 450 4567
Email: beeworks@xtra.co.nz

NBA Branches: First named is President/Chairperson. The second named is Secretary.

NORTHLAND
Garry Goodwin
57 Whangarei Heads School Rd
RD 4 Whangarei
Ph: 09 434 0118
Jo Scott
148 One Tree Point Rd
Ruakaka 0171
Ph: 09 432 7149
Fax 09 432 7144

AUCKLAND
Ian Browning
1824 Great South Rd
RD 3 Drury 2579
Ph: 09 236 0764
Bob Russell
101 Kern Rd
RD 3 Drury 2579
Home Ph/Fax: 09 294 8656
Work Mobile: 027 284 8951
Email: bob.russell@paradise.net.nz

WAIKATO
Cameron Martin
Haumea Road
RD 1 Galatea 3079
Ph: 07 366 4804
Fax: 07 366 4804
Email: busy-bee@xtra.co.nz
Jane Lorimer
Hillcrest Apiaries 'Kahurangi-o-Papa'
RD 3, Hamilton 3283
Ph: 07 856 9625
Fax: 07 856 9241
Mobile: 027 294 6559
Email: hunnybee@wave.co.nz

BAY OF PLENTY
Dennis Crowley
PO Box 9170, Greerton
Tauranga 3142
Ph: 07 541 3323
Email: crowleys@slingshot.co.nz
Barbara Pimm
448 Woodlands Road
RD 2, Opotiki 3198
Ph 07 315 7650
Email:hikuhoney@xtra.co.nz

POVERTY BAY
Don Simm
2 Walsh St
Gisborne 4041
Ph: 06 868 3866
Mobile: 021 150 3041
Email: donsim1@xtra.co.nz
Barry Foster
695 Aberdeen Road
Gisborne 4041
Ph: 06 867 4591
Fax: 06 867 4508
Email: bjfoster@xtra.co.nz

HAWKE'S BAY
John Berry
46 Arataki Rd
Havelock North 4130
Ph. 06 877 6205
Email: jrberry@ihug.co.nz
Mary-Anne Thomason
15 Sydney Tce, Takapau
Hawkes Bay 4203
Ph: 06 855 8038
Email: kintail_honey@xtra.co.nz

SOUTHERN NORTH ISLAND
Peter Ferris
PO Box 255
Masterton 5840
Ph: 06 378 7632
Email: happy.ferris@xtra.co.nz
Frank Lindsay
26 Cunliffe Street
Johnsonville
Wellington 6037
Ph/Fax: 04 478 3367
Email: lindsays.apiaries@xtra.co.nz

NELSON
Glenn Kelly
Motueka Apiaries
PO Box 421, Motueka 7143
Ph/Fax 03 528 8174
Mobile 021 159 8483
Email: nzhoneys@yahoo.com
Michael Wraight
15 Titoki Place
Motueka 7120
Ph/Fax: 03 528 6010
Email: wraight@xtra.co.nz

CANTERBURY
Roger Bray
Braesby Farm
RD1
Ashburton 7771
Ph/Fax: 03 308 4964
Email: birdsnbees@xtra.co.nz
Trevor Corbett
PO Box 20
Waipara, North Canterbury 7447
Ph: 027 450 4567
Email: beeworks@xtra.co.nz

OTAGO
Allen McCaw
Milburn Apiaries
RD2. Milton 9291
South Otago
Ph: 03 417 7198
Email: amccaw@clear.net.nz
Peter Sales
"Te Ora"
RD1, Port Chalmers
Dunedin 9081
Ph: 03 472 7220
Email: foxglove@paradise.net.nz

SOUTHLAND
Carne Clissold
Glass Brothers Ltd
RD5
Gore 9775
Ph: 03 207 1866
Email: carne@glassbrothers.co.nz
John Stevenson
Southern Lakes Honey
PO Box 163, Te Anau 9640
Ph: 03 249 7954
Email: sl.honey@gmail.com

www.nba.org.nz

National Beekeepers' Assn – Member Services

CHIEF EXECUTIVE OFFICER:
Jim Edwards
10 Nikau Lane
RD 3, Otaki 5583
Ph 06 362 6301
Fax 06 362 6302
Mobile 021 631 447
Email: ceo@nba.org.nz

EXECUTIVE SECRETARY:
Pam Edwards
10 Nikau Lane
RD 3, Otaki 5583
Ph 06 362 6301
Fax 06 362 6302
Email: secretary@nba.org.nz

NBA Librarians
Roger and Linda Bray
Braesby Farm, RD 1, Ashburton 7771
Ph/Fax 03 308 4964
Email: birdsnbees@xtra.co.nz

Publications Committee
Frank Lindsay
26 Cunliffe Street
Johnsonville
Wellington 6037
Ph/Fax: 04 478 3367
Email: lindsays.apiaries@xtra.co.nz

NBA membership & Journal Subscriptions:
Pam Edwards
10 Nikau Lane
RD 3, Otaki 5583
Ph 06 362 6301 Fax 06 362 6302
Email:secretary@nba.org.nz

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Telephone: 03 455 4486
Fax: 03 455 7286
Email: sales@southcityprint.co.nz

Editorial/Publication:
Nancy Fithian
8A Awa Road, Miramar
Wellington 6022
Ph: 04 380 8801 Fax: 04 380 7197
Mobile: 027 238 2915
Email: editor@nba.org.nz

Important contacts to the New Zealand Beekeeping Industry

Rex Baynes
AFB NPMS Manager
PO Box 44282, Lower Hutt 5040
rbaynes@ihug.co.nz
info@afb.org.nz

American Foulbrood Pest Management Strategy
www.afb.org.nz

AsureQuality phone:
0508 00 11 22
www.asurequality.com

Exotic Disease and pest emergency hotline
0800 809 966
www.biosecurity.govt.nz

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Deadline for articles and advertising

NB: No magazine in January

February issue: 29 December 2008
March issue: 26 January 2009

All articles/letters/photos to be with the Editor via fax, email or post:

Nancy Fithian
email: editor@nba.org.nz
(See page 2 for full details)

President's Report

Checkmite+®

Recently ERMA rejected the application from Bayer to market the organophosphate miticide product Checkmite+® in New Zealand. The Environmental Risk Management Authority (ERMA) found that at present there was no verifiable benefit in allowing the use of this product for varroa control when compared with the other varroacides currently on the market. However, they did issue a rather blunt warning that beekeepers need to make themselves aware about the issues of resistance developing to the current chemicals and to manage the use of these chemicals to prevent resistance developing in the first place.

"The Authority recommends that:

- the beekeeping industry establishes monitoring of varroacide efficacy in varroa mite populations throughout the country;
- the industry also works to improve beekeepers' understanding of resistance management and chemical usage against varroa mite; and
- ERMA New Zealand staff contact the relevant government and industry organisations to emphasise the need for further research into the management of varroa mite."

If significant resistance issues become apparent in the future, it is likely that the use of Checkmite+® will be revisited.

This brings up another issue relating to the improper use of miticide strips. It has come to our attention that some beekeepers in the South Island are using strips at half the recommended dose during the invasion phase. Not a bright idea and this will inevitably lead to some colony mortality and the increased likelihood of the early onset of resistance. **Use the required number of strips as recommended by the manufacturer.** Also follow the recommended management system of alternating treatment regimes with other chemical families. It's not rocket science.

Biosecurity slips up again

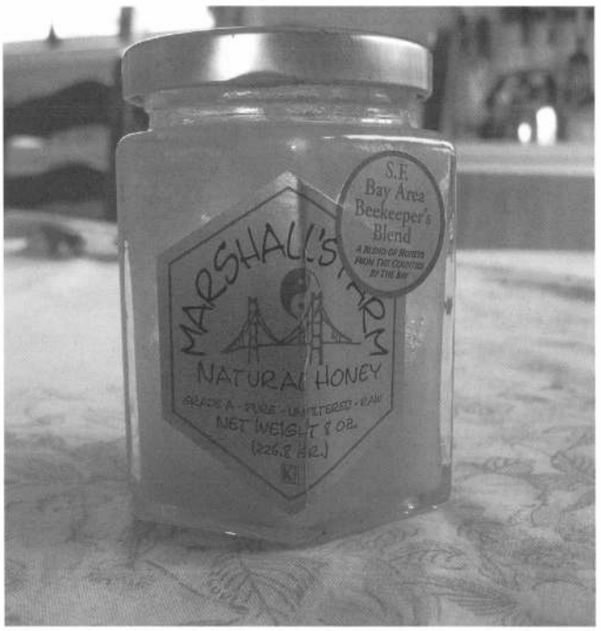
Recently I was visiting some people and the usual conversations arose about one's occupation. When I mentioned that I was a professional beekeeper this perked up their interest and the lady showed me some honey from her sister in law. The honey was from the United States! I explained that this was an illegal import and asked her how it got into the country. It had been mailed to her through the US Postal Service and had actually passed through the x-ray machine at Auckland. Clearly someone had slipped up badly.

I handed the honey into the MAF Dunedin office and explained the situation. Their staff were somewhat concerned about how it had passed through their surveillance system undetected. Hexagonal jars are a red flag for further investigation.

While the Biosecurity frontline staff are usually a motivated bunch who take their job very seriously, these sorts of slip ups can result in catastrophic consequences to this country's economic wellbeing. This honey is highly likely to contain EFB, *P. alvei* and *Nosema ceranae*.

The Minister of Biosecurity has repeatedly stated that the integrity of our biosecurity border control systems are vitally important to protect our country from undesirable organisms that can affect the primary production industries

which this country so relies upon. Yet a jar of honey passes straight through their x-ray machine undetected. Was anyone looking at the time?



- Frans Laas

Pollination – the sparkplug of agriculture

Protect your stainless steel plant

I had a wake-up call from my son recently. He works in a hospital lab and as you know everything must be kept scrupulously clean. They clean everything down every day but have found over a year that stainless steel covers will rust, and as the rust can't be removed the covers have to be replaced.

Now I know a little about rust and I was told to never weld over stainless steel, as the fine particles given off by the welding rod will form rust spots that stay there forever. But I hadn't realised that cleaning also causes rust.

A lot of us are now using sodium hypochlorite-based products (C31) to keep our plants clean. These products have a salt base to stabilise them so if not washed down afterwards with plain water, they will leave a tiny salt film on the metal's surface, and we know what salt does.

My son's suggestion was to wash away any salt residue with water and then perhaps spray on food grade/edible oil to seal the surface.

I noted when visiting extracting plants in Australia that some didn't use any chemicals for cleaning down their units. They used a 90°C hot water sprayer every day after completing extraction, as honey left in the unit attracts ants. These plants looked bright and shiny as if they had just been installed.

Keep an eye on all stainless steel equipment.

- Frank Lindsay

Comments from the NZFSA

The cleaning procedures for stainless steel are well documented for anyone to read. Some very high chromium stainless steels don't suffer rust problems, but they are uncommon.

Don't use hypochlorites, chlorine or any salts with sodium chloride or any other chloride in them.

Don't use any abrasive with steel or iron in it (i.e., steel wool) as the iron particles grind into the stainless steel and they rust, which then stains the stainless steel. This rust is nigh impossible to get out as it is dispersed into the grain of the alloy."

Plenty of information can be found on the internet on cleaning stainless steel: e.g., check out http://www.atlasmetals.co.nz/files/ASM_Tech_Notes/TN5-0506-cleaning%20care%20&%20maintenance.pdf

Obviously only NZFSA-approved compounds can be used. Hot water (with or without detergent) and a good scrub would seem to suffice for most applications in the bee products industry.

- Mike Clear, NZFSA

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Introducing Glenn Kelly New Upper South Island Ward Representative

I was introduced to beekeeping over 30 years ago by Mr Laddie Mayson, an enthusiast beekeeper of Motueka and previously from Taihape. We established a commercial beekeeping operation based on pollination and moved into honey and pollen production.

I have held the position of Nelson Branch President for a number of years, and was in that role when varroa was first discovered in Auckland and more latterly in Nelson.

In representing the Upper South Island Ward, I intend to convey the range of views and knowledge of ward members to the Executive Council.

The NBA is the prominent beekeeping organisation in New Zealand and represents the interests of beekeepers and the industry in communication with Government agencies and other parties. This is an important role and I feel that I am joining a capable and competent executive.

- Glenn Kelly

Survey feedback

The survey was completed by 48 readers during the NBA conference in Masterton this year (full report next month).

Paul Badger was the winner of the box of chocolates. The publications committee would like to thank all participants for completing the survey.

Frank Lindsay
Chairman
Publications Committee

Honey—what is it?

When we first started selling honey in retail packs we were told that we had to put nutritional information on the back of the pack. We enquired and were told to refer to the NZFSA website for suitable information.

The resulting information gave us 82.1 gram sugars per 100 gm of honey with, I suspect, the balance being mainly water. Of particular interest was that the carbohydrates also were 82.1 grams, so obviously honey is mainly sugar and water with traces of other things.

Then I did a silly thing: I actually had some of our honey analysed. I separated manuka from non-manuka type honeys. However there were not many differences between the two types.

The first thing that impressed me was that only about half the honey is made up of simple sugars and disaccharides such as sucrose and maltose. The rest of the solids are actually complex carbohydrates, which are ideal as they give a lower GI index which spreads energy production.

Of the minerals, honey is very low in sodium, quite high in potassium and calcium and has quite high levels of sulphur, phosphorus and magnesium.

Of personal interest is the presence of small amounts of gold in the honey we have had tested. Not enough to make you rich.

Of course looking at the analysis, we are obviously not selling honey at all, as NZFSA say that honey must contain at least 60% of reducing sugars; i.e. glucose and levulose.

I would be interested to see the nutritional information that could be arrived at from the above analysis. The individuals investigating the standards for honey obviously have some work on their hands looking ahead.

- Gary Jeffery

Perhaps other beekeepers could test their honey and see if they come to the same conclusion.

An overseas varroa experience (and other bee-related matters)

It was my privilege to spend time in England, Switzerland and South Africa where I met up with fellow beekeepers including Mike Brown and Mike Allsopp, experts in this science. During my travels I learnt a great deal about varroa and other bee-related matters. I had wanted to further my study of varroa that I had started as a New Zealand Mathematics, Sciences and Technology Teacher Fellow through the Royal Society of New Zealand. *[Editor's note: see 'Keeping our bees buzzing' on page 9 of the February 2008 journal.]*

Above: The Swiss bee house and inside the Swiss bee house. Right: The Swiss smoker.

Beekeeping in England.

The English experience is similar to New Zealand, where up until now varroa has been treated with synthetic chemicals. The problem in the United Kingdom is that the mite continually builds up a resistance to the treatment, which therefore has to be continually changed. Many of the older beekeepers are not varying their treatment and this is not helping the situation.

It is hoped that scientists can come up with effective treatments in the future, as many of the existing synthetic treatments are no longer effective. Mike Brown cannot give an explanation for the Colony Collapse Disorder, but believes that *Varroa destructor* plays a major role.

In Switzerland I met up with an elderly beekeeper and through an interpreter I learnt he had lost a large proportion of his hives to Colony Collapse Disorder. Synthetic chemical treatment is also used here, although this gentleman used essential oils soaked in pads that were placed above the frames. It was interesting to see other beekeeping variations, such as their smoker and the bee house that kept the beekeeper out of the snow in the winter months.

The Swiss and English each use a different variation of the Langstroth hive, with the Swiss having a completely different arrangement when it comes to the hive house.

The South African experience was quite different. They don't treat hives for varroa at all—it is survival of the fittest. Weak hives are allowed to die out and those that survive are perpetuated. Mike Allsopp described the Santa Cruz experience. An island off the USA had some 50 hives that were deliberately infected with varroa. The hives were not treated and started to diminish in number. Then a turnaround occurred: the bees started building resistance to the varroa, resulting in beehive numbers returning to the original 50.

Mike Allsopp also says that our New Zealand experiment on Mercury Island is a step in the right direction with the raising of varroa-resistant queens. However, he believes that with the reintroduction of these bees into our bee industry, much of the good work will be undone because we perpetuate weaker strains by treating all hives.

Mike Allsopp with a frame of 'killer bees'

Mike says another advantage South African beekeepers have is the great diversity of their breeding stock. We in New Zealand have a much narrower genetic base. Varroa, he says, has sometimes been viewed as "a rich man's problem". In much of Africa, as well as other parts of the world, beekeepers can't afford the treatment. Yet, they

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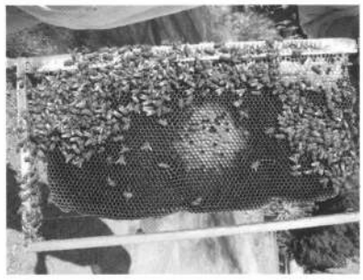
believe, this absence of treatment is the best way forward. The small hive beetle is present in all South African hives, but poses no threat to the African bees.



A frame of the extraordinary Cape bees.

The *Apis mellifera capensis*, or Cape bee is a very interesting bee in that if it enters a non-capensis colony, these same worker bees develop their ovaries and start laying eggs. This eventually results in the destruction of the hive. The Cape bee must therefore be kept a safe distance from any other bee species.

The Cape bee is only found in the southern part of South Africa where fynbos (native fine bush) grows. The other bee found in southern Africa is the *Apis mellifera scutellata*, also known as the 'killer bee'. These bees are prone to swarming and are disturbed easily, but are manageable. Genetic tests done in the USA suggest there is very little difference between the scutellata and the Africanised bee found in South America, Central America and now parts of North America. The scutellata bees have some favourable characteristics in that they seem to be more varroa resistant and are super hygienic. American foulbrood is not found in these hives, and wasps are not a problem either.

Some interesting things I heard from beekeepers during my travels:

- even moderate amounts of alcohol have an adverse effect on one's health when stung by bees
- there is no evidence of beekeepers developing cancer, as long as the beekeeper continues keeping bees and receives stings and pheromones
- Scutellata honey bees are far better collectors of honey and better varroa groomers than Italian honey bees
- Colony Collapse Disorder (CCD) is not a new phenomenon
- the only places still free of varroa are Australia and Central Africa
- Honey bee numbers world-wide are declining because of varroa and consequently honey prices are increasing. Yet, in New Zealand most honey prices are falling
- Another reason given for the declining bee population is the lack of proper bee forage. In Australia they are countering this with a *Trees for Bees* drive.

It was an interesting experience and I learnt so much. I found the general public have a greater interest in the honey bee than ever before. There were those that believed the honey bee was endangered and that something had to be done to protect them.

I would like to thank the many beekeepers and scientists that gave me their time. I would also like to thank the NBA and the Honey Industry Trust, who took an interest in my endeavours.

- Neil Furness
Senior Teacher, Papatoetoe Intermediate School
New Zealand Sciences, Mathematics and Technology Teacher Fellow

How's your health?

I don't go to the doctor very often. The last time a nice-looking young lady suggested she take a knife to me to remove some large moles which I consider perfectly healthy. Anyway a few months ago I saw my regular doctor and as I don't see him very often, he decided to get some blood tests done. My results were a little surprising—I'm low in Vitamin D.

Thinking about it, it doesn't take a rocket scientist to work out that as most of the time my body is fully covered with a bee suit, I'm not getting a lot of sun. He gave me a few pills to take. I'm not adverse to pills but perhaps I should be getting it naturally; i.e., change my bee stock completely so I can throw away the bee suit and work them in shorts and T-shirt.

No, I don't think I'll be doing that as some of my defensive bees protect themselves longer from mites, and you need the odd defensive hive to dissuade vandals from tipping over hives or borrowing the occasional frame of honey.

So the next time you visit the doctor, ask for them to check your Vitamin D as some of you might be suffering from the same deficiency.

- Frank Lindsay

New contact details for Christchurch Hobbyist Club

Meets on the first Saturday of each month, August to May, except in January for which it is the second Saturday. The site is at 681 Cashmere Road, commencing at 1.30 pm

Contact: Jeff Robinson (President)
PO Box 167
Kaiapoi, Christchurch 7644
Phone: 021 662 973

NBA Executive Council, September 2008

Back row: CEO Jim Edwards, Trevor Corbett, Neil Mossop, Vice President Neil Farrer, Glenn Kelly.
Front row: NBA President Frans Laas, Jane Lorimer, Maureen Maxwell, Lewis Olsen, Executive Secretary Pam Edwards, Barry Foster.

Photo supplied by Jim Edwards.

The new nosema disease: a real threat to beekeeping!

Tony Roper
Apicultural Officer
AsureQuality Limited, Christchurch
ropert@asurequality.com

Introduction

Most beekeepers are familiar with *Nosema apis* and the problems associated with this beekeeping disease. Recently *Nosema ceranae*, a new species of nosema, was discovered in colonies dying from Colony Collapse Disorder (CCD). Initially it was thought that this could be the major cause of CCD.

Nosema ceranae was only discovered in 1995, by Professor Ingemar Fries when visiting China. He described the new species of nosema, which at that time was found only in the Eastern honey bee, *Apis cerana* (Paxton, 2007). Like varroa, this newly discovered nosema did not respect the species barrier and would also infect Western honey bees, *Apis mellifera*, if they were brought into contact with *A. cerana*. This has happened in a number of Asian countries, such as Vietnam, China and South Korea, where *A. mellifera* has been introduced to increase production. Lee (personal communication) mentioned that there is a lot of robbing by *A. cerana* when this species comes into contact with *A. mellifera*. *Nosema ceranae* is now fairly widespread, indicating that this

Apis mellifera *hives in South Korea*

disease has moved out of Asia. In Spain, there have been massive colony losses over the winter of 2005–2006, some of which have been linked to Nosema disease (Paxton, 2007). Paxton's article mentions that this disease is now found across Europe and in North and South America. It is also now in the United Kingdom.

In this article I will talk about nosema in general and then explore the specific characteristics of the new species, *N. ceranae*. I will outline methods beekeepers use to control both types of nosema and then look at the possibility of this disease arriving in this country and the biosecurity problems associated with it.

General background on nosema

Nosema is the most widespread disease of honey bees and I find it somewhat surprisingly that it is often overlooked by beekeepers. Nosema is defined as a beekeeping disease caused by a microsporidian, a parasitic spore-forming protozoan (a one-cell organism). This protozoan invades and severely damages the digestive tracts of adult worker honey bees. Queens and drones can also be infected but not larvae. The lifespan of infected workers is less than half that of healthy bees, and the ability of infected nurse bees to produce brood food and feed larvae is greatly reduced (Graham, 1992).

It is far more serious if queens become affected with nosema, for their egg production is reduced and they are often quickly superseded. There are a number of dangers associated with supersedure of queens. Firstly there is the danger that the replacement queen may not be mated because of the time of the year and the colony will go queenless. The second danger is the loss of colony strength as it can take over a month for a laying queen to be produced. During this time the colony will be going backwards and may not build up to sufficient strength before a subsequent nectar flow or pollination event. This will result in the colony not being able to obtain a surplus honey crop or have sufficient field bees for good pollination.

Nosema is spread in the faeces of infected bees, especially if they are confined for long periods and have defecated on combs. Healthy bees will be infected while cleaning up the spore-contaminated combs. Nosema is very much a silent killer. Most hives have some level of this disease and over a season quite large numbers of bees will be killed, often without the beekeeper realising anything is wrong. Nosema infection peaks in spring because of the high contamination in the hive, which causes many bees to become infected as they clean up cells. Beekeepers often blame the resulting short crop on the weather, but in fact the cause is most likely to be nosema.

Specific dangers of ceranae

Nosema ceranae is very similar to *N. apis* but a number of authors have suggested that *N. ceranae* is far more lethal, especially to *Apis mellifera* colonies. This new form of nosema can completely destroy whole colonies in six months. *N. ceranae* survives hot and cold conditions and can kill European bees in a matter of days in a laboratory (Hayley, 2007). In New Zealand *N. apis* weakens colonies, especially in the spring, but is rarely blamed as the primary cause of a colony's demise. Infected colonies usually recover and will gather a crop, albeit a much smaller one.

Paxton's article (2007) states "the implications for beekeeping with the western honey bee *Apis mellifera* are profound! Currently there is a correlation between *Nosema ceranae* and colony mortality." Paxton goes on to point out that there is a synergistic relationship between *N. ceranae* and other factors such as varroa mites, leading to increased colony mortality.

This means that the death of a colony is determined by a number of accumulating factors rather than any single one cause, but *N. ceranae* may be the last straw that will break the camel's back.

It has been suggested that *N. ceranae* could be the possible cause of CCD. Lee (personal communication) stated that if *N. ceranae* is associated with deaths from CCD, then it is relatively easy to test bees to see if they have this disease. The spore shape is quite different between *N. ceranae* and *N. apis* to someone familiar with these particular diseases. In Korea, researchers can distinguish between the two using optical microscopy techniques; however PCR techniques are more sensitive. Lee also mentioned that *Nosema ceranae* is unlikely to be the cause of CCD because bees infected with this disease would not be able to fly, and this is not one of the symptoms associated with CCD. However the UK authorities report that *N. ceranae* infected colonies do not show evidence of dysentery and crawling bees, as is often seen with *N. apis* infected hives. Also, *N. ceranae* infected colonies gradually lose bee numbers, show low honey production and increased losses during the autumn and winter (Budge, 2008).

What beekeepers can do

The key to minimising the effects of *Nosema sp.* is to minimise colony stresses, especially in winter and early spring. Colonies must be wintered in sheltered sunny spots where bees will be able to get cleansing flights. In the late autumn, colonies should also have plenty of honey and pollen stores and have plenty of healthy bees headed by a good queen to ensure the colony will winter well. Good varroa control is also essential.

As spore-contaminated combs and equipment are the most likely sources of re-infection, they should be eliminated. Spores on combs and equipment can be treated by heating to 49°C for 24 hours or fumigated with a suitable chemical. Alternately, old combs can be culled out and replaced with new wax foundation or plastic frames.

Overseas some beekeepers feed an antibiotic, Fumagillin (Fumidil-B®) in syrup, which suppresses nosema but does not kill the spores. Unfortunately this chemical is no longer available to New Zealand beekeepers as it is not registered.

Likely biosecurity threat to New Zealand?

Because *N. ceranae* is so contagious, and has spread globally in such a short time, it is possible that this disease will be found in New Zealand, if in fact it is not already here? There are a number of pathways for *N. cerana* to arrive in New Zealand. The spores are very resistant and can exist on used equipment and in contaminated water. This disease could possibly be introduced into New Zealand in bee products and live bees.

If Eastern honey bees established in New Zealand, it is most likely they would introduce *Nosema ceranae* into our bee population, with serious consequences to the whole beekeeping industry. This is likely to happen with a swarm hitchhiking on a ship or being introduced into New Zealand by misguided beekeepers. *[Editor's note: Please refer to pages 3 & 4 for the latest biosecurity breach.]*

This new form of nosema from Asia may or may not be a cause of CCD but it is known that it is a contributing cause of colony mortality. No cases of CCD or *N. ceranae* have so far been reported in New Zealand. Because of our fairly warm, wet climate, *N. ceranae* could run rampant, especially in the spring when colonies are placed under additional stress for pollination.

Therefore, the most important message for beekeepers is to be on the look out for any signs of *Nosema ceranae* in their hives. Look for:

- queen-right colonies dwindling to the point of collapse
- noticeable loss in production
- the appearance of other secondary pathogens such as chalkbrood and even American foulbrood.

Make sure varroa is under control as this mite can lead to these symptoms too. If you are concerned please contact Biosecurity New Zealand (0800 809 966) or your local Apicultural Officer at AsureQuality (0508 00 11 22). It is better to be safe than sorry. Once established, it will be too late to eradicate this new disease.

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Daddy's helper

Pictured is Emily Woods, age 7. Emily is helping her dad with gold kiwifruit pollination in Opotiki. Emily has been helping her dad since before she was 5 and is very comfortable around the bees—she even took live bees to her school's pet day this weekend.

Emily got Champion Pet at Woodlands School, Opotiki on Saturday 18 October with her project and live bee display.

The photos were taken by her dad Michael Woods.

- Susan Woods

From the colonies

Auckland Branch

Spring is well upon us in Auckland and colonies are rearing brood and expanding nicely. I live in an area of Auckland that has a large proportion of hobbyist farmers. I also share this area with some larger commercial operators who specialise in pollination/honey production. Being spring, they are all getting their mite treatments in, getting pre-inspections of their hives and taking note of failing queens/hives to split, and of course, doing AFB checks. Very soon a lot of hives from the area will up and leave for kiwifruit or avocados. At the moment it's just giving the bees enough room to expand without swarming. There have been a couple of swarms that I have heard of and one from my own hive: I should keep my queen excluder cleaner.

- Terry McColl

Bay of Plenty Branch

Along with the spring hail, wind, rain and sun, we have now collected our first swarm of the season and put the first hives into gold kiwifruit pollination, and it's just the beginning of October. Along with the start of the gold kiwifruit comes the first rain in a couple of weeks, just to make things a little more interesting in wet, contoured orchards.

The Rewarewa has started to flower in some areas with the usual good and bad flowering, depending on where you are. The Barberry has also started so there should be no more feeding required except in orchards.

To date, mite numbers are generally low, although a few beekeepers have found a surprising number of mites when opening hives in the early spring.

Conference 2009 planning is progressing well with a number of sponsors and speakers already committed to attending. Once pollination is competed we will be bringing you regular updates each month on conference. Meanwhile, earmark 7–11 June 2009 for conference 2009 at the Millennium Hotel Rotorua.

- Barbara Pimm, Branch Secretary

Hawke's Bay Branch

It seems like apple pollination has just begun but already it is time to move them out again. So far I have had no reports of poisoning, but it is early days yet.

The weather in the last month has been quite reasonable except right up against the hills, and most hives have reasonable stores. It is already getting quite dry and if we don't have rain within a couple of weeks it will be getting serious.

Varroa numbers have been low but no doubt they will build up again by autumn. How many of you out there realise that

nosema is no longer classed as a protozoa but as a fungus? I'm not sure what difference this makes but it's fun to learn anyway.

- John Berry, Branch President

Canterbury Branch

MAF Biosecurity has removed all movement controls to restrict the movement of varroa in the South Island. This is the time for all beekeepers to reflect on their business (if they have not already done so) and make personal strategies for their survival. The key to varroa survival is profitability within the business. Current treatment costs and South Island crop averages suggest that a producer increase in the price of honey would need to be $1 per kilogram. The increases in other inputs (fuel, etc) will increase the amount of dollars per kilogram needed to maintain viability.

The major spread of varroa is by beekeepers and while beehives may not be moved large distances; the spread of varroa in a shipment of queen bees should not be underestimated. It is possible that the next varroa find in the South Island is at a place far from known infested areas, with no obvious beehive links, but where a beekeeper has purchased queen bees from a distant area.

Naturally the beekeeper 'grapevine' has been extremely active in Canterbury at this time as well as doom and gloom reports. We all need to focus on realities: the main reality is that beekeepers 'get' varroa from another beekeeper, and 'pass' it on to another beekeeper. Care must be taken to avoid blaming, or ostracising beekeepers because "he bought varroa into my area". We are all in this together and must concentrate on cooperation for our mutual benefit.

The other reality is the 'cost' of varroa as well as the 'effect' on Canterbury and the South Island. There may well be areas where beekeeping is not viable because returns do not cover costs—it is not rocket science to abandon these areas. If farmers see a need for bees in such areas, then they will need to subsidise the beekeepers' operation or maintain their own beehives.

Another reality is the cost of varroa: there are various reports of varroa 'costing' between $25–314 million (makes a good story), whilst in reality the cost is able to be 'fixed' as the treatment costs of a beehive multiplied by the number of South Island hives. If some kind benefactor were to write a cheque annually for treating South Island hives, then $3–4 million would provide strips (plus installation costs) to enable South Island hives to be maintained for as long as current treatments work. This would maintain status quo with current beekeeping operations. As we do not have a kind benefactor, then beekeepers will each be responsible for finding (and passing on) treatment costs.

There has been, I estimate, well over $20 million 'invested' in South Island varroa control by Government, ratepayers, and beekeepers—this includes incursion responses, surveillance, movement controls, and setting up the (failed) strategy. We could well have had a fund which may have been able to provide treatment for South Island beekeepers on an ongoing basis if the money had been put into an 'investment account' rather than spending the way it has been. This was suggested at the time when the South Island options were considered prior to setting up the strategy.

- Roger Bray, Branch President

Chatham Islands

It is remote, windy, cool, with very little natural vegetation left. Michele Andersen and her partner Mana are living there now. Michele is a keen beekeeper and has started up an informal beekeeping interest group. We are in the process of bringing over 40 nucs to revive the industry.

View from out of the shed at Kopinga Marae, Chatham Islands, October 2008.

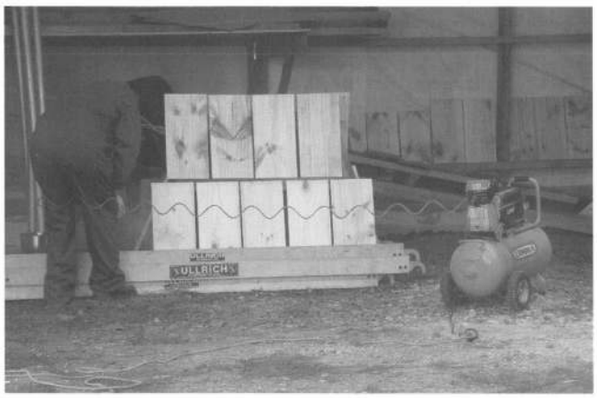
The tall trees are Tarahinau (Dracophyllum arboreum) and the smaller trees are Kopi/Karaka. Te Whanga Lagoon is just visible and further out is the Pacific Ocean. Farmland surrounds Kopinga Marae.

Varroa is on our doorstep and the Biosecurity Committee of the Chatham Islands Council has indicated the border will be closed to further imports after the shipment of our nucs in November.

We have only four to six hives left and a generational gap of beekeeping knowledge has occurred. We have support to grow the necessary skills and knowledge and Michele and Mana are busy helping/teaching/learning those islanders who have stepped forward to have a go. There is one thing for sure: we have plenty of 'cups of tea' whenever we get together.

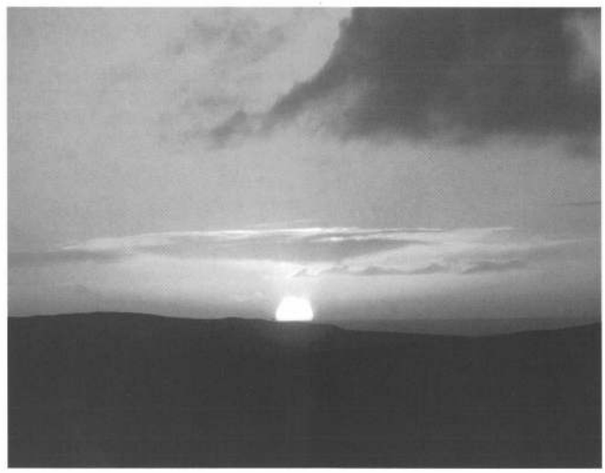
We have a keen group of about 10–20 people investing time and effort into this endeavour. The new box wood has arrived and we are busy preserving the wood, undercoating and top coating. We do not have a paraffin wax dipper to coat the wood.

Box wood and new gear has arrived.



We have electricity today so we are using a spray gun to speed up the job of preserving the wood.

Beekeepers from Mosgiel are supplying us with nucs in November and we are waiting nervously to see how the bees survive the courier trip overnight to Christchurch and the two and a half hour air flight across the ocean. Fortunately, the nucs are coming over in small lots. When the plane arrives in the evening we will rush off to our newly prepared hive sites and tentatively put the bees into their new homes.



Sunset view from Michele and Mana's kitchen.

There are many reasons why the hive numbers have dropped. The weather is a major factor and wind is the main deterrent for bees working. The bees need a lot of feeding along with a sunny, sheltered apiary sites. The other major resistance to beekeeping on this island is that some folk say, "bees spread gorse". My response is, "well, yes that is true. And did you know gorse pollen is essential for bees?" Needless to say gorse grows well here.

We also have a large number of kopi or karaka trees here and if the bees are hungry they will collect nectar from the flowers and die. The rule is to keep them feed or move the hives at this time of year. And yet some elders say bees are not affected by the kopi flowers.

I have heard tell the quality of honey in the past was very good. I am not sure what that means to our taste buds of today but I am sure looking forward to the harvesting season in late March. And there is always a bed for the travelling beekeeper and family.

Cheers until next time.

- Michele Andersen

[Editor's note: the Publications Committee welcomes the Chatham Islands to the colonies column. We look forward to hearing more from them in future.]

Apologies!

In the October issue of the journal we omitted to seek permission for and to credit the back cover photo to HortResearch. We apologise to Dr Mark Goodwin and his team for this oversight.

8 November 2008: another day in the life of a beekeeper!

Just another typical beekeeping day. The decision on what vehicle to use may not necessary be because of cost: it may be carrying capacity—work time rules. However, today it's the 4WD, as you're not quite too sure how sticky the sites may be after the last downpour of rain. Rules, rules, since when did beekeeping become so involved in rules?!

To the yard, and it's a quick look for signs of swarming. And what do you know, bees don't abide by rules. I told them last time I left, "now girls, don't do anything silly until I get back with some boxes". Maybe it's the old queen, knowing she is about to be replaced, getting out without the kick that gets rid of her. She will die of Hive-tool-itis! Smack her on the head; shush, did I really say that?! Don't tell anyone, will you. Maybe there is one thing worse than an old queen, one that has lost her ... you know ... become a drone layer.

Opening up the hive, finding good strength, lots of pollen, brood and stores always puts a smile on the face. You know that you made a good decision to requeen with good stock with patterns like this. This brood pattern on the right kinda reminds you of that place in Wellington that makes decisions as well.

Speaking of patterns, do you have a system of knowing the age of your queens? Which colour will you pick?

It doesn't have to be a ballot or guessing game, there is an international colour coding system for marking queens. Years ending in:

- '0' and '5' is blue,
- '1' and '6' is white/grey,
- '2' and '7' is yellow,
- '3' and '8' is red,
- '4' and '9' is green.

Whenever you are looking at the brood, if you can make it a habit to always look for anything unusual, then it will be easier to pick up disease, viruses, etc. It's not just about finding American foulbrood, it's the exotics that may come this way as well. Often things look good on the outside, but it's not until you delve into them that you realise that it's bad. Sometimes the only way to diagnose is under the microscope. The debate will always go on about how strong the border control is and how long it will be before the exotics arrive.

So you progress through your day, checking each hive methodically, looking for the abnormal. Perhaps it's time to super for the next crop, or maybe kiwifruit pollination is around the corner. How well you cleaned out your hive will have impacted on the season to come. Good luck for a super honey season.

- Fiona O'Brien

New book pays tribute to Dr Eva Crane

On the first anniversary of Dr Eva Crane's death, the International Bee Research Association (IBRA) has published the new book *Eva Crane, Bee Scientist, 1912–2007*, as a tribute to her life and work.

The book retails at £9.50 plus £4.00 postage and packaging to New Zealand. To order, contact the IBRA Bookshop,
16 North Road,
Cardiff CF10 3DY, UK, Fax (+44) 56 0113 5640;
Phone (+44) 29 2037 2409; E-mail: books@ibra.org.uk;
Website: www.ibra.org.uk

(Information provided to NBA by IBRA charity administrator Richard Jones.)

About the Apiary

The temperatures have climbed into the mid-teens most days, making beekeeping a little more pleasurable. Beekeepers are now into the busiest time of the season—swarm control and feeding.

It's mid October when I'm writing this and already there's a sweet smell of nectar in the bush areas. Most of our native trees are not particularly showy when it comes to flowers, unlike the native clematis (*Clematis paniculata*), which climbs to the light and has large white flowers. The flowers of our native trees are mostly small and you have to look to see them. At present lemonwood (*Pittosporum eugeniodes*), broadleaf (*Griselinia littoralis*), rangiora (*Brachyglottis repanda*), and many others are in full flower, while kowhai (*Sophora microphylla*) and tree lucerne (*Cytisus proliferus*) are tailing off. Mingi mingi (*Cyathodes juniperina*, an under-story shrub that has leaves like manuka, only slightly longer), cabbage tree (*Cordyline australis*) and rewarewa (*Knightia excelsa*) are budding up. Around the fringes of the bush, pollen is being supplied from weeds like gorse and broom, while ceanothus, with its blue flowers, stands out in urban gardens and also provides a good source of pollen.

Along rivers and shelterbelts the willows are finishing while in the older farmed areas, hawthorn (*Crataegus oxyacantha*) is just starting. You will also see along the highway edges that clover is flowering as a result of the radiant heat given off by the road surface. It won't be long until you will see the first signs of the summer honey crop in the paddocks.

Things are moving fairly quickly. Get to know your area. Record what's flowering and when. Note what stimulates swarming. Some of my apiaries are stimulated by cabbage tree and others by hawthorn. At home we have a bank of succulents. This year's spring was on time, as the succulent's flowers opened on the usual date, 7 October.

Achieving maximum honey production

The theory to achieve maximum honey production is to have a strong hive at the start of the honey flow. Eggs laid seven weeks before the flow (now) are the bees that bring in the crop. The difficulty is that some hives reach a population exceeding 40,000 earlier than this time, bringing in a little nectar which is stored in, around and on top of the brood nest. This confines the queen's laying and causes congestion, thus stimulating the bees into swarming mode.

By knowing what stimulates swarming in your area and when, you can time your spring management ahead of these flowerings, either by adding extra supers and frames or by splitting strong hives. If splitting is not an option, then it's possible to interchange a strong hive with a weak one. The flying population from the strong hives populates the weaker hive, and hopefully this reduction in bees will help to turn off the swarming impulse. Sometimes this doesn't work for very weak hives, as the field force entering the hive finds a different queen and kills her.

You should strengthen weak hives gradually by adding a couple of frames of brood and bees at each apiary visit until there is a full super of bees and brood. An alternative is to kill the old queen and unit a nuc on top, thus increasing the beehive population. Before you strengthen weak hives, fully investigate why the hive is weak. Check for disease (AFB, chalkbrood, sacbrood). If there are no signs of disease, change the queen before doing anything or unite a nuc on top using two sheets of newspaper. After the hive has been successfully united, it is possible to interchange hives at this point, as there are enough brood nest bees to protect the queen.

Sometimes no matter what you do, the bees continue to build queen cells even though they have a good laying queen (you will see numerous queen cells around the edges of the frames rather than a few beside the brood, which are generally supersedure cells). I once heard of a beekeeper who turned the complete hive upside down—he strapped the hive and physically turned it over on to its roof so that it was on the ground. Ten days later, he reversed the operation. This worked as queen cells need to be pointing down and when the hive is turned, the queen pupa turns within the cell before pupation so that the emerging queen cannot chew her way out and so dies in the cell. A bit extreme, but it just goes to show that there's always an alternative to swarming. (Can you imagine travelling around the countryside seeing all the hives standing on their roofs?) Generally reducing the bee population and giving them some foundation to build will turn off the impulse. It's always easier to control hive populations and therefore reduce the likelihood of swarming than to try and turn a hive around after they have already started queen cell production.

More on swarming and supering

My hives near the bush fringe have fresh dark honey in the top super and in the outside frames of the brood nest. Fine, still, warm days with a honey flow have produced perfect swarming conditions, and already two hives have taken the hint with the majority of bees having left to make a new home. These were particularly strong hives (four supers high) so I split them into three smaller units each to stop any after-swarming. How do you tell when a hive has swarmed? Sometimes the hives are so full of bees that it's hard to believe they have swarmed, but fresh nectar in the middle of the brood nest frames, no eggs and capped or emerging queens are a giveaway that you missed the telltale signs on your last inspection. Anybody catching these swarms will be very pleased.

Mine aren't the only ones taking off: we are now getting reports from the city of swarms in trees and on houses. Unfortunately we cannot do much for a swarm that has entered a house but those on trees can be found a new home. Swarming seems to happen so quickly, but in fact the hive's swarming preparations started a month or two ago with an increase in drone brood production. Learn to look for the early signs, mark the hives that show these signs and give them extra attention.

November also coincides with the northern hemisphere's 'June gap'; a two- to three-week period when very little is flowering. This could be noticeable in intensively farmed areas where every bit of the countryside is in production, which means that beekeepers in the rural areas will be watching inputs of nectar and pollen and doing supplementary feeding where necessary to keep the queens laying at their maximum. Hobbyists in the urban areas won't notice any setback to their hives as there's always something flowering and nectar is already pouring in.

Most beekeepers by now should be on a 10–15 day inspection cycle. These inspections are fairly simple and quick. I have a dry sugar feeder on most of my hives and just looking into it after removing the roof and split board tells me the condition of the hive. If I find a handful of bees or more in the top feeder it means they need more room, so I give them an extra super. I have even found some with wet honey in the feeder—bees making natural comb. For other beekeepers, it may mean tipping the hive back on the bottom board and looking at the bottom bars just above the base. If the bottom bars are all covered in bees, they need another super.

This inspection also consists of splitting the top brood super off the bottom super and looking along the bottom of the frames for developing queen cells. It's quite hard to see into the bottom of a queen cell bud (cup). While you are balancing a super on a 45-degree angle, so I open a few out a little with the hive tool to see if the queen has deposited an egg in the cell. If I see any eggs I split the hive. I fill another super with half foundation frames and half drawn frames, then put it on top of the bottom super. I next place the split board (entrance to the back) and then the second brood super and finally the honey super on the top, thus creating another colony.

I tend to go through the hive a little more thoroughly than that. I check a couple of frames where the bees are emerging for AFB and put the old queen up into the top brood super if I come across her, leaving a queen cell down in the bottom split. This system has some drawbacks. It can be time consuming and the majority of field bees go into the bottom super, which can still create swarming if there is more than one queen cell in the bottom half.

For most hives, it's just a matter of adding another super to give the bees more room. Lift a couple of frames with nectar in them from the super below, and add foundation frames to the outside of the brood nest to keep the bees busy.

For those new beekeepers with their first hive that started as a nucleus this season, don't add another super until all the frames are drawn out. This could mean that during each inspection, you can gradually move the pollen frames out and place new foundation frames in between. When all frames are drawn out, you can add another super but again, one or two frames from the super below must be put up into the centre of the new super to encourage the bees to move up. They generally won't move up into a full super of foundation without encouraging/baiting them.

So that's it for the month: keep the queen laying and bees building up in number. Give them something to do by drawing out new frames in and around the brood nest and hopefully you will have strong hives three or four supers high going into the honey flow.

Things to do this month

Check feed, check pollen. Do an AFB check, and get your Certificate of Inspection (COI) in the post before the end of the month. Cull old frames, or at least move them to the outside of the super so they can be removed at the next inspection. Add foundation frames into and above the brood nest to keep the bees busy. Fit foundation into comb honey frames. (Comb honey production might present an opportunity for some South Island beekeepers to produce extra income to assist with the costs of varroa treatments.) Super up hives as soon as a flow starts.

- Frank Lindsay

NIWA's climate outlook: October to December 2008

In the New Zealand region, mean sea level pressures are likely to be higher than normal, especially over the South Island, resulting in lighter winds than usual over the country and periods of easterlies affecting the North Island. Air temperatures are likely to be average or above average over the north and west of the South Island and average elsewhere. Rainfall is likely to be normal or below normal over much of the country, with near normal rainfall in the east of the North Island. Normal or below normal soil moisture levels and stream flows are likely everywhere in the country.

Under the prevailing neutral conditions of the El Niño–Southern Oscillation, there is a 4 out of 5 chance of an ex-tropical cyclone passing within 500 km of the country between November and May, with the highest risk in the Northland and Gisborne districts.

Control of varroa using organic treatments — part 6

Michelle Taylor, Mark Goodwin, Heather McBrydie, Omar Martinez and Lisa Evans

HortResearch, with support from the Sustainable Farming Fund (SFF), the National Beekeepers' Association (NBA), contributions from a number of beekeepers, and Zespri, are working with beekeepers to try to increase the efficacy of organic varroa control products. Last season four organic products were trialled. These were Apilife VAR®, Thymovar®, Apiguard®, and thymol crystals. Each of these products was applied to both single and double brood box hives. This is the sixth article of a series that will be written as a means of sharing the information about use and efficacy of organic varroa control products.

All the colonies that were treated with organic products last autumn required a second treatment with Bayvarol® to reduce varroa in late autumn. A possible explanation for why the organic products are ineffective may be that the effectiveness of an organic treatment builds up over time. The autumn treatments may have been applied too late to reduce the mite populations to a level with which the declining bee populations could survive. To assess this, colonies will be treated with an organic product at the end of summer, in February 2009 before the mite levels become too high.

The inability of the four organic products to control varroa in autumn 2008 has resulted in changes being made to the trial design. Apiguard® is the only product that will be assessed this season and the hives will be managed using three different methods. The reason only one product is used is that beekeepers do not have time to accurately assess the number of hives (approximately 70) that would be required if all three organic treatments were to be assessed simultaneously. The selection process used to determine which of the organic treatments would be selected this season is discussed toward the end of the article.

The three management methods below were requested by the beekeepers participating in the trial. It is hoped that these methods may increase the effectiveness of Apiguard® in autumn:

1) Oxalic acid. Oxalic acid kills phoretic mites. A treatment will be conducted immediately after the honey has been removed in February 2009 and before the Apiguard® is applied. It is anticipated that the oxalic acid will lower the phoretic mite levels to enable the Apiguard® to more effectively control varroa in autumn.
2) Ventilated floorboards. The ability of ventilated floorboards to reduce the number of varroa that climb back up to the brood nest and reproduce is thought to be beneficial when integrated in a varroa control programme. Whether this method reduces the varroa population enough to increase the efficacy of Apiguard® in autumn is unknown.
3) Food grade mineral oil (FGMO). The effect of FGMO in New Zealand hives has not been documented but as a number of beekeepers are using this method to control varroa it has been included in the trial. Some of the trial colonies will be fogged every four weeks from September 2008 to April 2009. The use of FGMO is not accepted by the current organic certification agencies.

Spring 2008

This season, eight beekeepers will each manage 21 double-super colonies.

Of the 21 colonies, nine have ventilated floorboards and the remaining 12 have full wooden floorboards.

The following treatments were randomly allocated to the 21 colonies at each site:

1) Control hives treated with Bayvarol®
2) Apiguard®
3) Apiguard® + oxalic acid
4) Apiguard® + oxalic + fogging.

The first mite assessments have been conducted using sugar shakes and the treatments have been applied. Overall, there seemed to be very few varroa in the sugar shakes, as is expected for this time of year. Regular fogging of the allocated hives has started.

Autumn 2009

For beekeepers to have time to assess the effectiveness of oxalic acid, ventilated floorboards and food grade mineral oil, only one organic product could be used. Apiguard® was selected based on the "average" opinion provided by the beekeepers. Their opinions took into account hive loss and therefore effectiveness in mite kill, ease of use, consistency of product, and label instructions. It must be noted that this decision is based on beekeeper preference rather than documented fact. It is therefore hoped that if any of the three factors increases the effectiveness of Apiguard®, their effectiveness should also be assessed on Thymovar® and Apilife VAR®. Thymol crystals will not be used this season because of the inconsistency of the results from last season (Table 1).

	Hive loss (number)	Ease of use (1-5)	Quality (1–5)	Direction (1–5)	Swarm	Total
Bayvarol®	0	1	1	1	0	3
Apiguard®	1	2	2	2	2	9
Thymovar®	4	3	3	4	0	14
Thymol	7	5	4	3	0	19
Apilife VAR®	6	4	5	5	0	20

Table 1. Products used in the trial last season were ranked by beekeeper opinion, with 1 being best and 5 being worst. The number of dead hives was included in the total for each product as was swarming, to provide some quantitative data. This gives more weight to the importance of hive survival.

Our thanks go to the beekeepers that are taking part in this trial, for their generous supply of hives and their time spent counting mites and applying treatments. Thanks to Ceracell Beekeeping Supplies for providing the Apiguard® at "cost" for use in this trial.

Cleaning old frames

If you are using wooden frames, they should be cleaned off when they are full of black wax. Hold them up to the light and if you can't see anything, it is time to clean them. It is good practice to replace 10 percent each season, no matter what. Of course if you have more time than money, they make good fire starters. Otherwise clean them down to the wires, check for any slack or displaced wires and reset new foundation.

Hobbyists can make a simple solar melter as detailed on page 109 of the 1997 edition of *Practical Beekeeping in New Zealand* by Andrew Matheson, available in most libraries. You should have your own copy for reference. If you decide to make a melter, here are some tips. Make it wide enough to take two frames at a time, suspended on two light wires. If buying glass, which is not cheap, ask for second-hand sheets. Mount in the lid with provision for thermal movement, or you will have to buy some more.

Place some old sacking under the suspended frames to trap all the rubbish that comes away with the wax. With practice one learns when to clean this off when the temperature is right. If it is too hot, one can't handle it, and if it's too cold the rubbish is hard to scrape off. Some say this rubbish is good garden fertiliser, but others are not convinced.

The melter should be positioned facing north, out of the wind and propped up to be roughly at right angles to the rays of the midday sun. (Of course this varies according to the time of year.) A small hole drilled in the side of the lid allows the volume of trapped air to vary according to temperature.

Collect the melted wax in an ice cream container, which is blocked up roughly level, with 10 millimetres of water in the bottom. When cooled, the wax is free from the base and the container is tapered to allow easy removal. If the wax is too dirty, just put it back in the melter and you will be surprised how clean it comes out. Save the wax to sell to your local beekeeping supplies merchant—it is often worth more than honey!

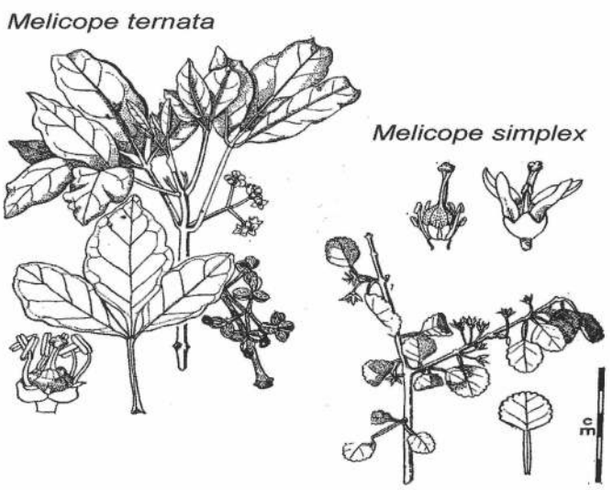
More and more people are using plastic foundation, which does not like the heat generated in a solar melter! Just scrape down to the foundation for reuse. We are still trying to find a satisfactory method of disposal for these frames when not suitable for reuse.

- Ron Morison

Trees and Shrubs of New Zealand

Melicope ternata
Maori name: Wharangi

Melicope simplex
Maori name: Poataniwha



The Wharangi is a small bushy tree four to six metres high, with smooth grey bark from which bees gather a gummy propolis.

The leaves are shiny and yellowish-green, seven to 10 centimetres long. The flowers are small and green in small clumps, flowering from August to November, from which bees gather a dark, rather acidic-flavoured honey. This tree is found as far south as Kaikoura.

The Poataniwha is a small tree up to four metres high with leaves one to two centimetres long, found in both islands. The flowers are small and greenish-white and worked freely in September and October for a light-coloured nectar. This nectar, as for its cousin the Wharangi, is acidic in flavour. Some trees of the Poataniwha are adapted for self pollination, while flowers on some trees are such that it is impossible for them to self pollinate.

The gum of the Wharangi was chewed by the Maori for bad breath. The honey was reputed to be poisonous. In 1888 the 3rd Waikato Regiment camped in Taranaki. One member of the regiment ate the wild honey said to have come from the Wharangi and consequently died.

The Taranaki Maori are most careful that their horses don't eat the Wharangi when travelling through the bush. It is reputed to be more poisonous than Tutu, although the honey is not rated poisonous in *Nectar and Pollen Sources of New Zealand* (Walsh 1978).

- Tony Lorimer

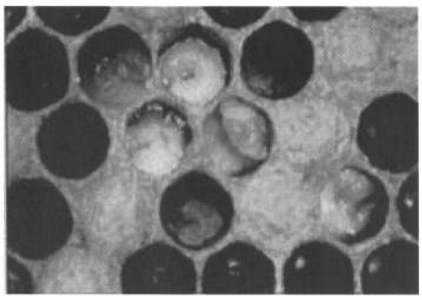
Are New Zealand beekeepers capable of identifying European foulbrood?

Marco Gonzalez
Apicultural Officer
AsureQuality Limited, Christchurch
gonzalezm@asurequality.com

More than ever, beekeepers must be vigilant in the identification of European foulbrood (EFB). The decision to allow honey imports from Australia has been put on hold, pending the outcome of legal deliberations. However, Australians are visiting New Zealand more than ever before (Statistics New Zealand, 2008) with one million Australian visitors expected within the next 12 months. Also, there is the possibility that some contaminated Australian honey could be smuggled into New Zealand, not to mention honey from other countries.

The aim of this article is to raise awareness of the similarities and differences between symptoms of EFB and other brood diseases endemic to New Zealand.

EFB, like American foulbrood (AFB), is a bacterial disease that is endemic in most parts of the world where bees are kept.



EFB kills bee larvae at an earlier stage of development than AFB (often before they are capped) and the pupal tongues are never found in larvae that died from EFB.

In countries where EFB is endemic, it doesn't usually kill the colony but reduces the honey yield and affects colony populations necessary for pollination. In the state of South Australia, beekeepers estimate that the cost of EFB in a hive equals the loss of a full super of honey for that season (Michael Stedman, personal communication 12 September 2007). The preferred chemical treatment for EFB involves the use of the antibiotic oxytetracycline. However, this creates issues with residues in honey and can mask AFB symptoms in infected hives. In the UK, beekeepers currently consider EFB a far more damaging disease than AFB (Murray Reid, personal communication 28 May 2008).

The effects of EFB in New Zealand, for a few years after its initial introduction, are expected to be dramatic. These could involve high colony losses and a large number of infected hives within a short period of time. Additionally, EFB may affect market access due to the potential use of antibiotics as a control method.

New Zealand has never had a case of EFB reported and the bees have not had a chance to build up resistance to this disease. Therefore, similar mild and seasonal effects on the hive strength and survival as seen in Australia cannot be expected here. In fact, the effects of EFB in New Zealand, for a few years after its initial introduction, are expected to be dramatic. This could involve hive losses or significant weakening of hives and a large number of infected hives within a short period of time (known as epizooty, that is, a disease affecting a large number of animals at the same time within a particular region or geographic area.). This is what happened in eastern Australia in the 1970s after EFB was initially diagnosed. Additionally, EFB may affect market access for bee products due to the potential use of antibiotics as a control method.

An aggressive behaviour (epizootic) is expected from a biological agent when introduced into a new ecosystem with favourable conditions for its establishment. Clear recent examples of this can be found in the New Zealand beekeeping industry following the introduction of wasps, chalkbrood and varroa.

Because EFB is very contagious it is important to detect it as early as possible. This is especially so if the beekeeping industry expects an eradication attempt to be considered by MAF Biosecurity New Zealand.

Misdiagnosing EFB for AFB could lead to an increase in AFB levels.

In New Zealand there is a perception among some beekeepers that EFB would not show up in their neck of the woods first. Field misdiagnosis of EFB by beekeepers for other brood diseases would jeopardise our chances of an eradication attempt. European foulbrood can be easily confused with other honey bee brood diseases that are found in New Zealand and, once established, could lead to a spread of AFB especially if antibiotics were applied incorrectly. These other look-alike diseases include: American foulbrood, Halfmoon Syndrome, Parasitic Mite Syndrome and Sacbrood.

Continuous training in field diagnosis of bee diseases will keep our guard up.

The annual Honey Bee Exotic Disease Surveillance Programme, managed by AsureQuality Limited and funded by MAF Biosecurity New Zealand, is a very useful tool in the detection of an exotic bee disease or pest. However, our best defence is provided by the thousands of skilled beekeepers who inspect all hives in every apiary around the country on a regular basis. Provided beekeepers report any suspicious findings promptly to an apiary officer, we will hopefully get an

early indication of whether any new disease has established or not. Continuous training in the field diagnosis of bee diseases will help keep our guard up.

Beekeepers should be seeking refresher training in disease recognition for both endemic and exotic diseases. Beekeeping clubs and companies alike should encourage their members and staff to undergo this training as part of regular pre-season upskilling. This can involve as little as reading about the symptoms of endemic and exotic bee diseases, or treating as suspicious any bee disease symptoms that don't fit the diseases previously found within the beekeeper's apiaries.

Field diagnosis of EFB in colonies in New Zealand is made more difficult due to the presence of Parasitic Mite Syndrome (PMS) and Halfmoon Syndrome in hives. It is very difficult to tell the difference in the field between Halfmoon Syndrome and EFB because the symptoms are both nutrition related (Anderson, 1988). However, hives with Halfmoon Syndrome may have multiple eggs in cells, supersedure queen cells and the symptoms usually disappear if the colony is requeened.

If a beekeeper reports a suspicious bee disease through the 0800 809 966 MAF Hotline, an AsureQuality officer will investigate and may get suspect samples sent to a laboratory to test for *M. plutonius*, the bacterium that causes EFB. Technicians may examine stained smears under the microscope, culture samples or perform a test using ELISA (enzyme linked immunosorbent assay) or PCR (polymerase chain reaction).

In the next section the main features of endemic honey bee diseases that can be confused with EFB are presented in a table, followed by a selection of pictures of diseased brood.

I would like to extend my gratitude to Dr Mark Goodwin from HortResearch Limited, who kindly supplied the high-quality pictures of endemic brood diseases.

continued on page 27

Letter to the editor

Russian beekeeper seeks work

Alexander Metelitsa is a 38 year old beekeeper.

For more information please contact

Address:	18–7 Blokhina St., St.-Petersburg, 197198
Email:	metelitsa111@rambler.ru
Tel:	895 0028 7312

Table 1: Distinguishing Features of EFB, endemic brood diseases and syndromes

FEATURES	EUROPEAN FOULBROOD	AMERICAN FOULBROOD	HALFMOON SYNDROME	PARASITIC MITE SYNDROME	SACBROOD
Causative agent	Non-spore forming bacteria *Melissococcus plutonius*	Spore-forming bacteria *Paenibacillus larvae*	Probably caused by a nutritional and/or genetic disorder of virgin queen bees.	Brood symptoms that occur with high varroa levels and secondary viral infection.	Virus Sacbrood virus
Age of dead brood	Younger than AFB Usually larvae die before pupation at the 'C' or pre-pupal stage.	Older than EFB > 3 days Larvae usually die at pre-pupal or pupal stages after the cells are capped. Larvae never die at the 'C' stage.	Similar to EFB Curled (younger) larvae, including capped curled larvae in advanced cases.	Similar to EFB, from the C stage to the pre- pupal stage.	Larvae usually from 4 days old. Pre-pupal stage only. Cells often capped over.
Appearance of brood comb	Patchy brood pattern with larval cells not capped over. Sometimes sealed in advanced cases when there may be perforated, sunken cappings.	Pepper pot irregular cappings. Sealed brood with sunken cappings, darker in colour, irregularly perforated. Sometimes cappings completely removed.	Patchy brood pattern. Multiple eggs in many cells, eggs attached in chains joined end to end. In advanced cases, high percentage of drone brood in worker cells.	Pepper-pot pattern with chewed cappings	Sealed brood. Cappings perforated or may be completely removed, sometimes sunken
Colour and shape of dead brood	Larvae change colour from pearly white of healthy larvae to dull white, yellow then yellowish brown. Body segmentation retained. The tracheae (or air tubes) are very white against the yellow bodies. Larvae may be twisted up the walls of the cell (corkscrew) or lie in a halfmoon scale around the lip of the cell.	Off-white, then coffee-brown, then dark brown to black. Loss of body segmentation and structure.	Off-white, yellowing to dark brown. Body segmentation retained Tracheae may be evident as lines in larvae.	White/yellow colour Body segmentation retained	Larvae change from white to yellow, coffee brown, grey, then black. Heads are usually darker than body Body segmentation maintained
Dead brood consistency	Recently dead larvae are watery to pasty in appearance and rarely show signs of ropiness. Old infections are usually creamy or rubbery and can rope up to 20 mm, but not to the same extent as AFB. The ropiness is due to the presence of secondary bacteria *Paenibacillus alvei.* Larvae collapse as if melting and eventually dry to form a loosely attached brown scale.	Sticky like glue when fresh and often ropes out. Once it dries it forms a black scale and is difficult to remove from the cell wall.	Watery contents and can be removed from cell. Doesn't rope out very well.	Scales can be removed. Brood never ropes like AFB	Plastic sac, skin remains intact with watery contents. Pre pupae easily removed from cell. May "rope" a little but strand is not even coloured and is blotchy in appearance. Not elastic like AFB.
Odour of brood	Varies from odourless to sour or foul smell depending on the secondary invading bacteria present.	Can have foul smell (rotten, fishy smell)	Sour, urine-like.	No evident odour	None to slightly sour.
Appearance of dead larvae and scales (dried larval/ pupal remains).	Larvae 'corkscrew' up the cell or are found lying across the mouth of the cell in an open 'C' or halfmoon shape Capped brood can rope out (secondary bacteria). Scale dries out and is easily removed from cell.	Larvae slump down along the bottom 'V' of the cell. Often rope out. Tongue sticking up from front end of cell base if died in pupal stage. Larval scale shaped like bullet against cell floor. Scale dries out and is difficult to remove.	Larvae corkscrew up the cell or lie around the cell walls or the lip of the cell in a halfmoon shape similar to EFB. Easily removed from cell. Rubbery scale with no tongues present.	Larvae often slump along lower cell wall like AFB. Larvae can also spiral up the cell wall or coil in a 'C' shape at the cell opening. Doesn't rope out	Can dry down to scale. Rarely ropes out. Easily removed in one piece from cell. No tongue present, but larval head may be curled upwards and resemble tongue.
Tips for identifying	Very contagious disease. Usually appears when there is a low nurse bee to larvae ratio in the spring. Larvae die before capping and often twisted up the cell walls or in a 'C' shape at the entrance.	Ropiness test and tongue, hard to remove scales	Drone brood in worker cells, multiple eggs in cells, eggs stuck end to end and often to the cell walls, some supersedure queen cells may be present. Symptoms disappear with requeening.	Varroa mite is present. Symptoms disappear after effective varroa treatment.	Disease can disappear by itself. Requeening with a resistant strain will help remove the disease.

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Pictures of diseased larvae with EFB compared to brood diseases endemic to New Zealand

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	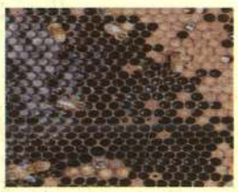			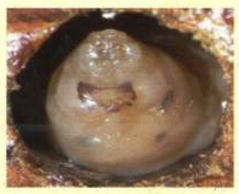
			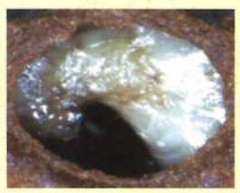	
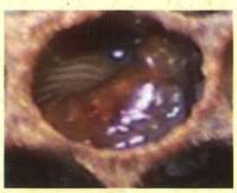	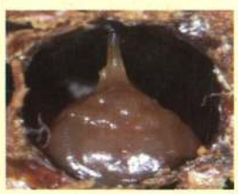			
				

Table 2: Pictures of diseased larvae with EFB compared to brood diseases endemic to New Zealand.

Source: EFB and Halfmoon Syndrome photos, and the top photos of AFB and PMS are courtesy of AsureQuality Limited. All other photos by Dr Mark Goodwin, Hort Research Ltd.

Photos supplied by Dr Mark Goodwin and AsureQuality Limited.