March 2015, Volume 23 No. 2

The NEW ZEALAND BeeKeeper

Seizing our opportunities

- Wasp biocontrol update
- Selecting a breeder queen
- DHA, MG and manuka honey activity
- Argentine ants

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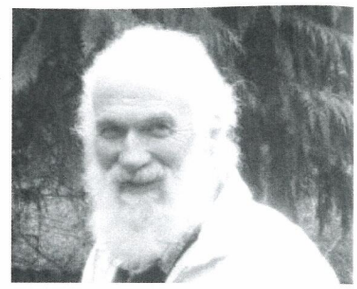
Front cover: 'The Happiness': this photo, taken by Rotorua beekeeper Matt Ward, shows a family friend, Bronwyn Mogridge. As Matt tells it, "Bronwyn recently spent a few days with us. She was fascinated by my beehives, so we dressed her up in a spare suit and she came out with me to find out all about this obsession that I have. As she was striding out through the long grass, her not-very-well-fitted suit became entangled around her ankles and she went down like the sack of proverbial! You can well imagine the hilarity that followed. Luckily someone produced a cell phone and snapped off this shot."

Seizing our opportunities

By Ricki Leahy, NBA President



I do not want to sound alarmist but I have a growing concern about AFB in this country.

I'm concerned that as an industry we are not developing a positive and widespread attitude to tackling the elimination of American foulbrood (AFB). We risk losing that opportunity.

I hear lots of gossipy AFB stories that worry me—I'm sure many of you have heard them too. You know the ones: such-and-such, who works for so-and-so, says that they are finding heaps of diseased hives and the boss doesn't report it all. The boss says to do something or other with the hives to deal with it, which such-and-such considers is dodgy, and this, that and the other. And so it goes on.

You never quite know what to believe, and nobody feels inclined to do anything because there is a risk that the story is grievance-orientated. And no one has any inclination to apprehend 'the boss' on such a serious matter only on hearsay, and then risk verbal retribution, etc. I am certain we have all heard similar tittle-tattle.

This sort of attitude places at risk the opportunity to actually eradicate AFB, now that the feral population of bees is being terminated by varroa on a regular basis. I know that AFB residue in the feral dead-outs is a problem, but over time this will disappear due to wasps, mice and other critters (including our own bees) robbing and cleaning them out.

But surely we must believe there is an end in sight. We also need to realise how very privileged we are to have our AFB Pest Management Plan (AFB PMP) operating in New Zealand, which gives us the tool to control the spread—and even the means to eliminate AFB—if we beekeepers choose to work together to achieve this worthwhile objective.

The most important aspect of our AFB PMP is that beekeepers pass a disease recognition test, which enables us to obtain and sign up to a Disease Elimination Conformity Agreement (DECA). When we get our DECA, we agree to conform to the stated process of dealing with any diseased hives found. A component of this agreement is reporting the finding of AFB and declaring that the hive(s) have been dealt with accordingly. It is a legal requirement to notify the finding of any AFB.

Some years ago, Andrew Matheson, author of *Practical Beekeeping in New Zealand*, used to tell us "Make your first cost your last cost". I believe he meant that we shouldn't waste our time experimenting trying to save our bees or honey from a diseased hive. All the experiments you may dream up have been done before and have been proven to fail. All you achieve is to spread the disease to other hives and, at the same time, make your hive management difficult by having hives in some sort of quarantine.

> "Just because you get disease it does not make you a bad beekeeper."

So what happens when you take honey off a suspected AFB hive? How far does the contamination unknowingly spread? It just becomes a nightmare. Research tells us that AFB is guaranteed to rear its head again—and probably become more widespread—so develop the attitude that you are glad to have found it in the first place. Burn the hive, knowing that it can't now spread, and be reassured that your first cost is your last cost.

In my opinion, to achieve any success in eliminating AFB, we need to change our attitude about it and get used to talking and seeking support and advice from others. Just because you get disease it does not make you a bad beekeeper. We all know you have no control over where your bees forage. The problem is that we don't talk about it enough.

Perhaps we should be more concerned about ensuring that when we sell hives, or set someone up with their first hives, that these beekeepers know about AFB and can recognise symptoms. Encourage new and more-experienced beekeepers to belong to a club and/or the NBA, and ensure that they know about the dangers or risk involved in not having any experience or knowledge about disease.

It is not just a beginner beekeeper problem. It could be that some of the largest operators present our greatest threat. Shortcut practices, like honey being harvested with no disease checks, can quickly lead to disaster in the future. At the end of the day, the spread is mathematically astounding; especially with the way hives are moved about the country nowadays.

Last month I touched on ethics. This topic is really just an extension of that. As NBA members, let's make a change, starting by congratulating each other for finding disease. Support each other by figuring out where it may have come from, and work out a plan to improve our management by being open and talking about it. We really do need to change our attitude. Take a hard look at what you may or may not have done yourself before blaming anybody else for your woes. Maybe you could have supported that aging beekeeper a long time ago before the problem got out of hand. Maybe that is a part of where our ethics need to change.

To finish on a positive note, most of us are very good beekeepers and that is well recognised. But our biosecurity depends on all of us: this should be one of the key drivers encouraging us to work together to make AFB elimination achievable. Happy beekeeping.

February EC meeting report

By the NBA Management Team

The Executive Council headed out of Wellington and into Waikato country for its first face-to-face meeting of 2015 in February.

It was a foggy start to the morning!

The EC used the opportunity to host members of the Waikato Branch to an informal gathering where Branch members could mingle with EC members in a casual setting. There was also a more formal question-and-answer session during which local beekeepers could tackle the EC on a variety of issues concerning the local Branch.

The meeting was successful, with some positive action points arising and productive discussions with both the conference organising committee and members of the Waikato Branch.

Earlier in the day, the EC had dealt with a variety of Association matters, including a progress report from the Interim Working Group (IWG) on the Bee Industry Unification project. Chair of the IWG and NBA EC member, Kim Singleton, gave that report, which included discussion on the industry survey on the issue of unification. The survey has been sent to all beekeepers in the country and closes on 6 March. Results will be fed back to beekeepers after that. For more information on this project, see beeunified.org

The EC also moved to invite Rotorua beekeeper, Kim Poynter, to join them as a temporary secondment for the East Coast Ward representative's role until the upcoming AGM. *[Editor's note: Kim has accepted and is now the East Coast Ward representative.]*

The Waikato Branch Conference organising committee joined the meeting after lunch, along with Philippa Rawlinson from Federated Farmers Bee Industry Group (BIG), who is also on the conference committee. Jane Lorimer, chair of the conference organising committee, outlined plans for the conference. She said a website is being built for conference. This will be used for registrations and information, and will go live approximately 1 March.

The theme for the conference is Practical Beekeeping. Wairakei Resort Taupo is already proving to be a good choice of venue, with plenty of options for workshops and seminars. The committee have also organised many sponsors, with 14 larger sponsors on board to support the conference. Jane also acknowledged support of hobbyist beekeeping clubs that have come on board to assist with conference planning.

The Executive Council met with Waikato Branch members in Hamilton on 18 February 2015. Photos provided by the NBA Management Team.

NBA welcomes SC recommendation

By Daniel Paul, NBA Chief Executive Officer

The NBA is very pleased to see the Local Government and Environment Select Committee's recommendation that the government review neonicotinoids and their use in their New Zealand.

The SC report was tabled in Parliament in mid-February. The NBA has been lobbying hard for this decision for the last three years.

NBA Chief Executive Officer Daniel Paul and Sue Kedgley MP at the launch of the 'Green Party Bee Strategy – 2011', 29 March 2011. This was followed by a 'Save the Bees' march to Parliament by beekeepers on 30 March 2011. Photo: Mary-Ann Lindsay.

We worked closely with former Green MP Sue Kedgley to initiate her petition on this issue. That petition was signed by over 6,000 people. In recent years, we have also attended Select Committee hearings, met with various MPs and briefed officials around Wellington.

It is great to see the NBA's efforts paying off with this new report from the Select Committee.

Like everyone else, we'll be keeping an eye on progress and doing our best to ensure we get the outcomes on this issue that our members want.

DHA, MG, and manuka honey activity

By Megan Grainger, Ph.D. Student, The University of Waikato; Technologist, Analytica Laboratories

In recent years the words methylglyoxal (MG) and dihydroxyacetone (DHA) have become linked with manuka honey.

They are strongly related to the 'activity' of manuka honey, which we measure as NPA/UMF®. This article gives some explanation of how the 'activity' of manuka honey is measured, and how MG and DHA fit with this.

Since ancient times, honey has been known to have antibacterial properties. In most floral types, the antibacterial action is due to three things: hydrogen peroxide in the honey (which is produced from the breakdown of glucose by the enzyme glucose oxidase), low water activity, and acidity (low pH).

In the 1990s, manuka honey (from the nectar of *Leptospermum scoparium*) was found to have an extra antibacterial property which is not explained by hydrogen peroxide, water activity or pH, and is often referred to as Non Peroxide Activity (NPA). Initially, researchers could not identify the compound responsible for the NPA, and the term 'unique manuka factor' (UMF®) was coined by Professor Peter Molan from the University of Waikato. NPA and UMF® are both used to describe this extra antibacterial property in manuka honey.

The NPA of manuka honey was originally indirectly measured because the compound responsible for it was unknown. The test was carried out on an agar plate, and involved the procedure described below.

- The enzyme catalase was added to a honey solution, which removed its hydrogen peroxide activity.
- The honey was then placed in wells on microbiological agar plates that were infused with the bacteria *Staphylococcus aureus*, before incubating overnight.
- At the same time, a known antibacterial compound (phenol) was added to wells on each plate in known concentrations, to provide a set of standards that the honey could be compared against.
- Honey with non-peroxide activity prevented bacteria from growing close to the well, and formed a clear zone around it. The higher the NPA, the larger the clear zone.
- The diameter of the clear zone was compared to the diameter of the clear zone around the phenol standards. The NPA of the honey was expressed against those standards; for example, a honey with a clear zone the same diameter as a 20% phenol standard has an NPA of 20.

In 2008 there was a breakthrough! Two independent laboratories (Mavric et al., 2008; Adams et al. 2008) discovered that NPA/UMF® in manuka honey arose from the presence of methylglyoxal (MG) in the honey. Fast, accurate and high-throughput testing methods using high performance liquid chromatography (HPLC) can now directly measure the MG in honey. The correlation between MG and NPA/UMF® has been established, so that the NPA/UMF® rating can be calculated from MG. For example, a honey with NPA/UMF® of 10 contains 263 mg/kg MG and a honey with NPA/UMF® 20 contains 829 mg/kg MG. More information on the calculation of NPA/UMF® from MG is available on the Grading System page of the Unique Manuka Factor® Honey Association's (UMF®HA) website.

Researchers also observed that the concentration of MG increases over time in many honeys. In 2009 it was discovered that DHA, which is found in the nectar of the manuka flower, is a precursor of MG in honey (Adams et al, 2009). DHA does not have antibacterial properties. But over time DHA converts to MG through a natural chemical reaction, and therefore measurement of DHA in manuka honey gives an idea of the potential for MG to increase (and therefore NPA/UMF® to increase) in the honey over time.

DHA is unique to manuka nectar, and has not been found in any other floral types of honey. The conversion of DHA to MG occurs slowly over time, and there are almost certainly other compounds in honey that affect this conversion. This is the subject of a lot of recent and current research. The conversion of DHA to MG is not a 1:1 reaction and current research will help us to better understand this conversion in the future.

Treatment during storage is another factor that affects the conversion of DHA to MG. Although heat accelerates the conversion of DHA to MG, if storage conditions are too warm, DHA and MG may convert to side products.

Measuring the DHA in freshly harvested honey tells the beekeeper about the potential that honey has to develop MG (and therefore NPA/UMF®) in the future. Honey with a higher starting DHA concentration has the potential to have higher MG concentration after storage than a honey with a lower starting DHA concentration.

Increasingly, honey is being sold and purchased based on both its MG level (the current NPA/UMF® of the honey) and its DHA level (its potential to 'grow' in the future). Beekeepers can expect that with ongoing research and development, there will be better tools available to predict the NPA/UMF® of a honey in future.

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Wasp biocontrol update

By Ronny Groenteman, Landcare Research, PO Box 69040, Lincoln 7640 E-mail: GroentemanR@landcareresearch.co.nz

Following is the latest update on the wasp biocontrol project from Landcare Research, the science provider for the successful applicant, the *Vespula* Biocontrol Action Group.

Mites on Vespula germanica. *Both photos are copyright © Landcare Research.*

In the previous update we told you about the application we made to the Environmental Protection Authority (EPA) to determine the legal status of the wasp mite. *[In December 2014]* we received a nice Christmas gift in the form of a decision by the EPA determining that, for the purpose of the HSNO Act, the mite is a non-new organism.

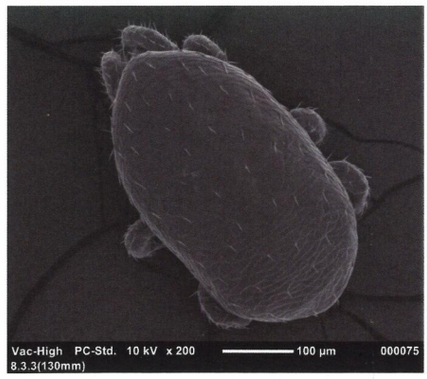
This doesn't mean we have any better knowledge about when and where from the mite came to New Zealand or if it is native. It does, however, mean that when the time comes that we are ready to mass rear and distribute the mite, it will be legal for us to do so. For that time to come, we still need to learn a lot about the biology and safety of the mite.

The decision document has been loaded to EPA's website and is available to the public at http://www.epa.govt.nz/search-databases/Pages/applications-details.aspx?appID=APP202252

If you are interested in a bit more context to this document, please read the section at the bottom of this update, and if you have any questions, please feel free to send them through at the address above.

Wasp numbers are already increasing, as can be expected in late February, with high numbers of workers already foraging. Incredibly, some nests are already producing numerous new queens, much earlier than expected! Now that nests are fully established, workers' traffic make them easier to locate. If you find any nests that we could easily access for safe digging, either in Canterbury or at the Top of the South, please let us know. Bob *[Brown, Landcare Research]* has recently began sampling nests to figure out how widespread the mites are.

During each of the three years of the project, we intend to survey three regions for mite prevalence. This summer we started with Canterbury, Nelson Lakes, and other areas in the top of the South. Land owners in other regions: if you feel safe enough to dig and freeze nests, we would appreciate any contribution! But only if you are confident you can perform this activity safely!
Until the next update—wishing you all a stingless New Year!



Close-up of the wasp mite.

Non-new organism status: context to EPA's decision

The HSNO Act 1996 regulates hazardous substances and new organisms in New Zealand. For the purpose of the Act, organisms that were not in New Zealand prior to 29/07/1998 are considered new organisms and require approval to be brought into the country and are not allowed to be propagated and/or distributed intentionally. We took on the task to convince EPA that, although the wasp mite is a new organism to science and was not discovered anywhere in the world prior to being found by Bob here in New Zealand, it should nevertheless be treated as a non-new organism for the purpose of the HSNO Act. We wanted to convince EPA that the mite has likely been here for some time, but has gone unnoticed.

Why did we think the mite has already been here for a number of years?

Following Bob's discovery of the mite in 2011, we were able to find evidence going as far back as 2003 that the mite was present on the North and South islands of New Zealand and went undetected. While the clear evidence doesn't go further back than ➜

2003, it was strong enough to suggest that the mite was here several years earlier.

You may ask yourself: if the mite was already here that long, has it not had long enough to show off its biocontrol potential?

Well, you have to remember that natural dispersal rates of mites are slow. It often takes many years for insects and mites to build up dense populations—they may need a helping hand to get further quicker. They may do better when a wasp nest is already compromised for other reasons, in which case we may have to find a way to stress nests in preparation for mite takeover. On the other hand, we may discover that the mite is already as far as it will ever get and as damaging as it will ever get which is, simply put, not enough. There are still myriad unanswered questions about the mite. Let us hope that the mite has not yet had a chance to demonstrate its full potential, and that we are en route to utilising it!

Sources

Adapted from an e-mail from Ronny Groenteman, 24 December 2014. Further updates were provided via personal correspondence in January and February 2015.

http://www.landcareresearch.co.nz/about/news/snippets/wasp-biocontrol-update-2

http://www.landcareresearch.co.nz/publications/newsletters/landcare-research-enews/issue-4

http://www.landcareresearch.co.nz/about/news/media-releases/wasp-biocontrol-project-set-to-begin

BOOK REVIEW

Backyard Bees, written by Doug Purdie

Reviewed by Frank Lindsay, NBA Life Member

Here is a book for prospective beekeepers and new hobbyists that tells them, "I can do that".

Douglas (Doug) Purdie is the president of the Sydney City Branch of the Amateur Beekeepers' Association of New South Wales (Australia). The book is substantial (208 pages), with a modest glossary of beekeeping terms and an index at the back.

Backyard Bees is set out in rather a light print format but has beautiful full-colour photo pages throughout that help to tell the story. The book's subtitle is 'a guide for the beginner beekeeper'. It introduces you to beekeepers around Sydney, and shows them in their gardens with their beehives. This gives the prospective beekeeper an idea where to situate a hive and how it would fit in at their place.

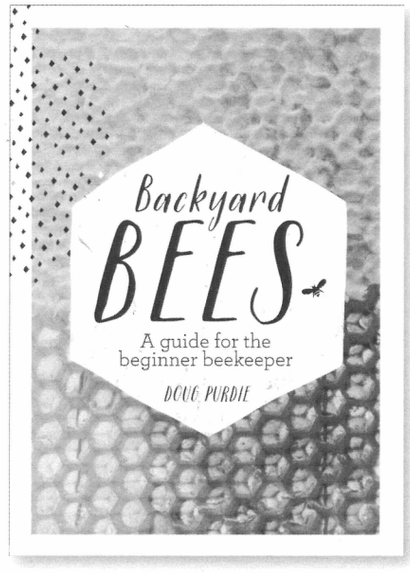
The book takes you through the beekeeping seasons, giving quite detailed explanations of bee biology, the equipment, how you light a smoker, work the hive, remove and extract honey, winter down hives, etc. It concludes with some lovely recipes.

Although written for the Australian beekeeper, *Backyard Bees* easily translates to New Zealand conditions although our tree and flower species are a little different. The Australian hive is also different in that the majority of Australian beekeepers use an eight-frame hive with a roof that fits flush rather than telescoping down around the top super. No hive mat as we know it is used, although some beekeepers use a sheet of vinyl or similar to stop the bees building brace comb up from the top bars up into the roof cavity when the hive gets crowded. Still, the same principles apply and the eight-frame supers are lighter and easier to handle.

The book includes a chapter on diseases but nothing on varroa, as Australia doesn't have the mite. However, as Australia does have small hive beetle (SHB), the book covers the practices needed to stop them laying in extracted frames, etc., which is something everybody should adopt in their beekeeping practices.

I haven't tried any of the recipes but they look very tempting.

I noticed a few minor errors but otherwise, this is a very good book. My only gripe, which is me being pedantic, is that eggs 'hatch'. Bees 'emerge' from cells. It grinds me a little to hear beekeepers saying the bee has just 'hatched' but for anybody new to beekeeping, this doesn't matter.



Backyard Bees would be a good gift for a new beekeeper or for someone who has had it in their mind that they would like to have a hive. This book will give them the confidence to get in and have a go.

Backyard Bees, A guide for the beginner beekeeper by Doug Purdie
Murdoch Books, hardcover, 208 pages,
RRP $39.99
ISBN 978-1-74336-171-9

Bee Time, Lessons from the hive

Reviewed by John McLean, NBA Research Committee

Bee Time: Lessons from the hive is the latest book from the pen of Mark Winston. We know him for his chapter on *The Honey Bee Colony: Life History* in the Dadant and Sons book *The Hive and the Honey Bee.*

Bee Time is not a scientific treatise. It is a reflective account of many aspects of the life and times of bees as social creatures intersecting in many ways with our own human social priorities. The conversational prose links us with many of Mark's experiences from his initial exposure to 'killer bees' in French Guiana to an extensive career with researchers as well as fellow beekeepers.

Mark reflects on many aspects that he has encountered in his research career with Apiculture and Social Insects at Simon Fraser University (SFU) and relates it to the current dilemmas all bees are facing in the oversimplified industrial agriculture world. This is contrasted with the joy of seeing urban beekeeping gaining a renaissance for the production of food as well as products in cities around the world. Closely allied with bee health is the recognition of the need for a variety of pollen and nectar sources so that bees can enjoy optimal health.

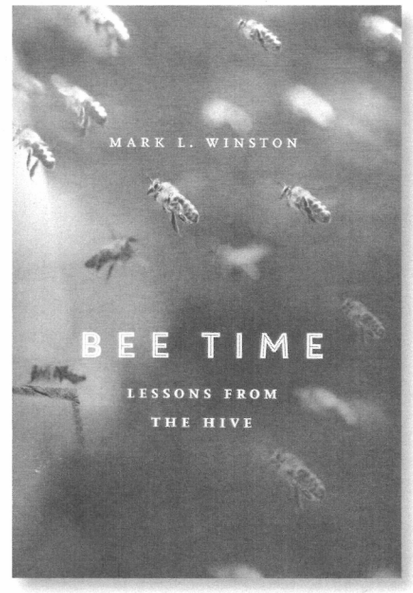
Mark opens his narrative with the reminder that "walking into an apiary is intellectually challenging and emotionally rich, sensual and riveting. Time slows down. Focus increases, awareness heightens, all senses captivated". How many of us have had that same concentration of effort and alertness as we seek to discover how our bees are doing at that time?

Mark's early academic career was based in the horticultural areas of the Fraser Valley in British Columbia as well as in the province of Alberta. Here his graduate students joined him in unravelling some of the mysteries of activities in the hive, as well as taking into consideration the environment in which bees were deployed for pollination duties in many crops. His team took special note of all pollinators and in one study showed that retaining adjacent natural habitats with various wild bees, as well as pollen and nectar sources, actually greatly improved yields in nearby fields of commercial crops.

The mystery of exactly what CCD might be is well explored in his chapter fittingly titled 'A Thousand Little Cuts'. With full awareness of all the studies that have tried to link factors to the sudden disappearance of what appeared to be a healthy hive, Mark takes us through some of the information accumulated as we deal with pests and diseases, pesticides and, also importantly, the simplification of industrial agriculture, where only the crop of interest is allowed to grow: no other floral sources, no weeds along a fence. The sterile environments aimed at focusing the bees' attentions on the crops also at the same time fail to give the bees the total support they need to stay healthy.

> "Are there lessons for us to learn in sustaining our own societies?"

In Vancouver, Mark had the opportunity to visit the rooftop gardens of several hotels and see the way the 'eco-hotels' manage their crops, which included the production of 270 kg of honey that is used in their restaurants. A little more investigation showed that many cities in the world support urban beekeeping. The research of two enthusiastic science fair students, Alice and Désirée, in their ongoing survey of wild bees in Vancouver, found 2600 wild bees and 911 honey bees on city lots. They showed that the bees needed suitable nesting areas, a variety of pollen and nectar sources as well as minimal pesticide use.



During his career, the author had the opportunity to visit many beekeepers in many parts of the world, from the ultra-industrialised almond cropping of the central valley of California to the apiaries of international colleagues and beekeeping enthusiasts whom he met at scientific conferences as well as at many bee club events. The anecdotal stories relating to fellow researchers and beekeepers alike bring a very interesting personal side in many segments.

Those who have never worked with honeybees appreciate the honey but the insects themselves are sometimes treated with apprehension with recollections of a painful sting. Mark reflects that when he talks with fellow beekeepers, words such as "calming", "peaceful" and "meditative" are used frequently. Having observed the collective activities of the bees Mark has experienced the many forms of communication used in the hive—vibrations, odours, antennal grooming—as well as sight of course outside the dark hive. All these social interactions and roles contrast with the interactions within our own social communities. Are there lessons for us to learn in sustaining our own societies?

In his latter career position as Academic Director of the SFU Centre for Dialogue, →

Mark compares and contrasts the collective behaviour and decision making within the hive with the social interactions task forces he has chaired. He joins a select group of senior university administrators who consider what they have seen in the hive as compared with what they see in the academic or civilian milieu they find themselves in. Mark discusses his own intersections of the bee and human worlds and the contrasts that he describes make for very interesting reflections.

This book is a delightful and inspiring read. Chapter-specific references have been provided for those who want to follow up on the details of studies mentioned. In this way the socially engaging text is uncluttered by scientific minutae, while providing a window for follow up on any of the issues of interest.

Bee Time: Lessons from the hive is published by Harvard University Press (ISBN 978-0-674-36839-2).

Price at MIGHTYape.co.nz $34.99 (hardback).

Publications Committee news

The March journal is the swansong for one of our proofreaders, Tom Baty. Grateful thanks, Tom, for your keen eyes and your diligence since joining the committee in September 2012. You will be missed.

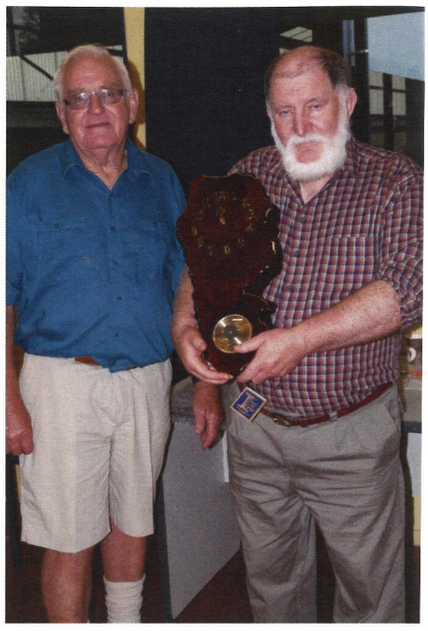
We are looking for someone to assist with proofreading the journal. Experience not essential. Broadband is preferred, as is access to three-way calling for the occasional teleconference.

If you are interested, please ring the committee chairman, Frank Lindsay, on (04) 478 3367.

Go well, Trevor Cullen!

By Frank Lindsay, NBA Life Member

On Saturday, 14 February, the Auckland Branch of the NBA organised a farewell early evening for Trevor Cullen, who has recently sold his business to Bruce Clow.



Auckland Branch president Graham Cammell (left) presented Trevor with a combination clock and weather station

Trevor was a diesel engineer, having worked in Fiji and Papua New Guinea building roads. He also worked at the Manapouri power station and other places before Graham Cammell talked him into taking over Ceracell Beekeeping Supplies 25 years ago (and they are still friends).

Trevor was not just a businessman, but also a friend. Well, he wasn't really a good businessman in one sense because he never sent out accounts on time, and often carried beekeepers financially in lean years without adding interest. Beekeepers are notorious for leaving things to the last minute, which saw Trevor working late most evenings from spring through the summer, sometimes up until midnight. He should have applied for his pension three years ago, but just couldn't find the time.

Trevor has vast industry knowledge and openly gives advice. He has been a great supporter of the industry, the Auckland Bee Club, the Auckland Branch and other branches, donating prizes and attending field days. His cafeteria was often used for meetings. He was always at conference and one of our major advertisers in *The New Zealand BeeKeeper*, as well as being a valued member of the Publications Committee.

Trevor (centre) is flanked by Bay of Plenty Branch members Allan and Barbara Pimm and Jody and Ralph Mitchell, who presented Trevor with a bee-themed artwork commissioned by the Bay of Plenty Branch for the occasion. Photos: Frank Lindsay.

It wasn't a big gathering of beekeepers but it was quality, with 10 NBA Life Members attending (including Trevor). We had an opportunity to thank him for his service and to express what he had meant to us. As one there said, it was better to say it to him now rather than wait until it was too late.

Trevor is softly spoken and is a relatively shy fellow, but we heard he also has another side when it came to his vintage 1933 V8 Coupe. He likes to drive it fast, real fast.

Trevor is not going off into the sunset but will be around for six months or more to ease Bruce into the business. We wish him well in his retirement but knowing him, he won't be putting up his feet for some time to come.

Make safety a priority

By Frank Lindsay, NBA Life Member

This might be a bit late in the season, but I have been told that some insurance companies are taking a hard look at the beekeeping industry because of the large number of claims received.

Fires are always a danger and it can happen to anybody. Rats gnawing at wiring is a major cause of shed fires. Larger-scale beekeepers store their boxes and gear in a number of buildings to reduce the risk of losing everything to a fire. Lose all your honey boxes and your production will drop for a year, putting your business at risk.

Extraction rooms are sticky places where we are constantly cleaning our hands. Honey seems to migrate to switches, especially those ones used for turning on equipment and lights. It's possible to protect them with plastic shields but there are other places needing protection that you may not have thought about.

Extraction rooms get relatively warm with steam from electrically heated uncappers and heat exchangers going, making it possible for the air to pick up moisture. During extraction, tiny droplets of honey are flung into the air by the extractor and circulate around until they contact a cold surface where they condense. If you leave a honey room uncleaned for a couple of years, mould will grow everywhere.

Several honey houses use fans to bring in cool air, which also creates a pressurised environment so warm air can pass out under doors and out through screened windows. However, warm air might also pass out through power points if the walls are not fully insulated.

The switch mechanism and wiring, being copper, are a lot cooler. This allows honey droplets to condense on them and over a few years they will become slightly sticky, causing the switches to spark. If the situation gets bad enough the switches will arc, causing an electrical short circuit that could melt the fitting and perhaps start a fire if the circuit is not protected against sneak currents.

As part of your winter maintenance, have an electrician mega (check the impedance of) all appliances and visually check the switches every couple of years.

It's also become a practice to warm manuka to accelerate the chemical action to increase its activity. Most of the bigger plants use heat exchangers but the odd beekeeper uses fan heaters: another potential problem.

Multi-boxes are well known to break down when overloaded and are a major cause of fires, so shouldn't be used. It might be expensive but it's far safer for your electrician to install more wall plugs. Tell him what you intend to use on each so he can calculate the amperage. He may have to put in independently fused outlets. Have him replace fuses with the most up-to-date protection devices.

> " Lay down the rules when driving with a load, on- or off-road."

Vehicles

It's easy to have an accident if you lose concentration when you are tired or dehydrated. New modern trucks feel and drive like a car, but they carry more weight and with speed, anything is possible.

Put your staff through driver training. Lay down the rules when driving with a load, on- or off-road. Young ones get their licence using automatic vehicles. They often haven't perfected a manual changing so ride the clutch. One of my helpers was a 25-year-old girl who looked in vain for a window switch. She hadn't seen a window-winder before: old technology.

Four-wheel-drive vehicles have low ratio for a purpose, as it provides more control at high revolutions. Use low ratio when starting with a heavy load on a slope or off road. Most modern vehicles can change from low ratio to high ratio while driving and the front wheel locking can be disengaged from a switch in the cab. Reverse gear in some older vehicles is lower than first gear, so drive up backwards. It's all about control with vehicle revs. Snow chains can give normal road tyres better off-road grip, especially in the wet. Sometimes it pays to walk a farm track first to ascertain its conditions and clear away fallen branches. I have often lost traction a few metres from the top in the wet, even while in four-wheel drive. If in doubt, put on the chains. It may take an extra five minutes to put them on, but it can also save hours trying to get out of a sticky situation.

Some NBA branches are organising driver training but it's up to all beekeepers employing staff to train them properly. Document everything so you are covered in case of an accident. WorkSafe will come down on you if you haven't.

Aftermath of a truck crash in the Wairarapa, September 2014. Full story available at http://www.stuff.co.nz/dominion-post/news/local-papers/wairarapa-news/10460202/Truck-crash-creates-real-buzz/ Photo: Piers Fuller/Fairfax NZ.

We discussed the recent Wairarapa truck accident at our branch meeting. (Most have had a scare dropping a wheel off the seal.) Rule one is: the centre line is the lifeline; never leave it. Never move over to allow another vehicle to pass. They will pass when there is room for them to move.

Keep clutter out of the cab. Objects become missiles in an accident.

Eastern Apicultural Society conference

By Frank Lindsay, NBA Life Member

I attended the Eastern Apicultural Society conference (EAS) in Kentucky, USA, 28 July to 1 August 2014. We swapped our wet and windy wintery days for mild, humid, 30-degree days: just lovely.

It costs a fair amount to travel to conferences and I wonder how much of the knowledge gained I should pass on. There are business advantages if you are a little ahead of the pack. Perhaps this was decided for me from a message in a fortune cookie that said, "If you have knowledge, let others light their candles by it".

At NBA branch meetings, we have always passed on knowledge to those who attend and through the minutes to members. Those outside the organisation are excluded. In most cases these folk are well established, set in their businesses practices and perhaps don't need to know how the other fellow is getting along. In the spirit of further education, following is a small taste of the EAS proceedings.

When first looking at the programme, I hadn't anticipated anything special but I was pleasantly surprised and actually learnt a lot. At EAS you have access to some of the best scientific bee brains in the USA. Knowledge is passed on freely. You just have to remember all of it, as there are new lectures on different subjects every hour. There is ample time to talk to other beekeepers and the vendors, as well as to buy something you need. I like to purchase any new books that take my eye and there are plenty to choose from.

This year five programmes were running concurrently over the five days: lectures for beginners and advanced beekeepers, a queen-rearing course, laboratory courses and practical apiary demonstrations. I opted for the senior beekeepers' lecture, which is aimed at beekeepers with a few years' experience running from five to 200 hives. The Americans teach bee biology well and you can't help but learn something.

Three outstanding lectures

Three presentations stood out for me. The lecture on drones by Jennifer Berry was extremely interesting. Timing is essential as you want to have mature drones available to mate with your newly emerged queens. It is necessary to set drone-producing hives up to four km diagonally away from your queen nuc hives so you can flood the drone-congregating areas with your desired stock. Drone lines are just as important as queen lines.

> "Queen-producing and drone-producing hives shouldn't be treated with any chemicals for varroa control..."

Queen-producing and drone-producing hives shouldn't be treated with any chemicals for varroa control, as these have an effect on both types of hives. Something that was stressed time and again was to leave varroa-control chemicals in the hives for a maximum of six weeks. This provides plenty of time to control varroa but more importantly, the short timing helps minimise the amount of chemical that goes into the wax. These have sub-lethal affects on the bees and yes, this includes the organic acids as well.

They (and perhaps we) should draw out our drone frames using unwaxed plastic frames or allow the bees to draw out natural drone comb. This could mean drawing them out the season before and storing them until they are required, or positioning them on the outer frames of the brood nest where the bees fill them with honey stores.

The lecture on moving into commercial beekeeping was also a highlight. This was presented by Rick Sutton, a local Kentuckian who moves his hives around the country following pollination and honey crops. The size of truck you choose is important: you need something big enough to carry everything likely to be required for a day's work. For big trucks, you need lockable wheels and perhaps tag axles for that extra weight we all seem to carry.

Like the Australians, some of the larger American beekeepers are moving hives huge distances and obtaining up to five nectar flows. Pollination generally has its problems. Hives get hit by neonics (systemic pesticides) on some crops like pumpkins. Rick Sutton would make a split and charge double, as these hives will die from chemical poisoning and will have to be rebuilt again using new frames.

Rick also covered moving hives and how to look after the bees during these long moves. Without water, the bees will cannibalise the brood. They have to be on the road early to miss the midday heat of the desert.

Another suggestion was a quick way of making nucs. Just shake the bees off capped brood frames and put these above a queen excluder, then split. Rick can make up to 120 a day. The importance of knowing your area was emphasised. A few miles either way could see bees build up slower because of poor nutrition. Even in America, willows are an important source in the spring for build-up.

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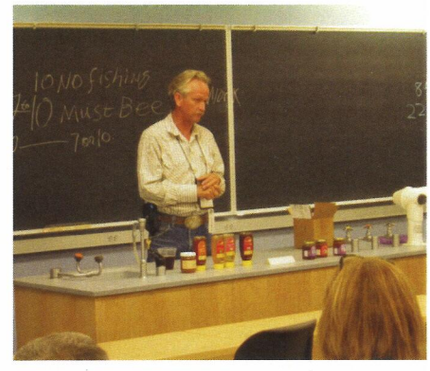

Rick Sutton explaining marketing.

Prepare for the honey and photo competitions!

It is a good time to start preparing for the national honey competition and the Ecroyd/Apiculture industry photography competition, both of which will be held at the New Zealand Apiculture Conference, Wairakei Resort Taupo, June 2015. Visit www.nba.org.nz/events for a sample of the schedule, rules and entry forms for both competitions.

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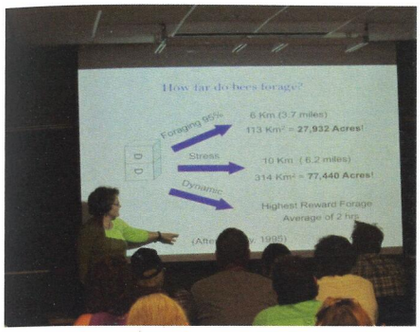


Maryann Frazier speaking about a beeswax pesticide study. Photos: Frank Lindsay.

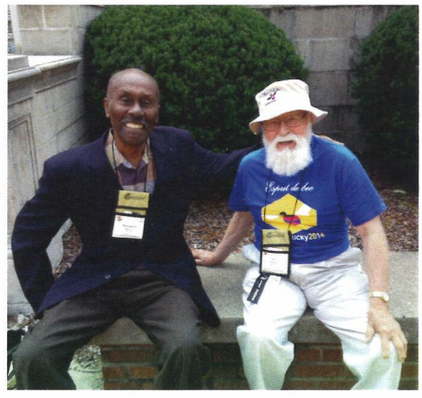
The third outstanding talk was a brief description of what's entailed in artificial fertilisation of queen bees, presented by Jeff Harris. Jeff used to work with John Harbo, who developed a lot of the techniques used in artificial queen breeding today. Jeff had modified his equipment to accommodate his large fingers and told us how to make our own pipettes. Jeff said you really have to take a course to learn everything and generally you will kill a lot of queens before you perfect the technique.
Cleanliness is essential in all aspects of the process. Jeff told us of most of the mistakes he had made learning under John Harbo and played us a few informal videos made for a previous course. All were made holding a handycam but for us, the little bit of shaking didn't detract from the presentation. Long after the session had ended, Jeff continued to answer questions for those still there.

Other memorable people and moments

Perhaps the most memorable personality on the non-scientific front was an older beekeeper, Ed Holcombe (84 years young), who talked to beginners and to more advanced beekeepers on managing bees for honey production.

Ed talked without the aid of electronics or notes so these talks went far longer than was planned. His crusade in life is to have beekeepers recognise the amount of work that Tennessee's first State Apiarist, Leslie H. Little, put in to producing a book for beginners in 1952. The book has been copied and added to a number of times without reference to Leslie Little. Therefore Ed gave a copy of Mr Little's book, *A Bee Book for Bee-Ginners*, to each person who attended his talks. The book also is available from Amazon: http://www.abebooks.com/Bee-Book-Bee-Ginners-Leslie-Little-Louis/571068940/bd
In the book Mr Little advocated strong colonies for honey production. These are built in the spring, once the first dribble of nectar stimulates the queen into production, by reversing the top and bottom super and adding honey frames to the bottom super if the hives is short of stores. The bees will take all the honey from the lower super and put it up into the top super. This creates an artificial flow that stimulates the queen into further production.

As soon as queen cells are started, there is a nine-day routine (between seven and nine days, depending on the weather) of cutting out cells, which can be a disaster if one cell is missed and the hive swarms. At each inspection the hive is assessed and reversed if the bees are covering most of the top super. During these inspections honey supers with drawn frames are added, usually two at a time to give the colony more room, (they use honey supers that are slightly smaller than our three-quarter super). Once the main flow has started, the queen is put down into the first or second super and a queen excluder put on the second to keep her down. By mid-January (our season) the honey is removed and the queen excluder put under the lid for the next season.



Randolph Furbert from Bermuda and Ed Holcombe from Shelbyville, Tennessee.

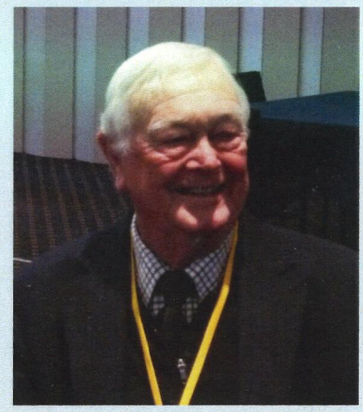
The book also covers bee diseases well as it was produced at the time when Leslie Little was in charge of disease control in Tennessee. Some of his photos were used in our AFB manual, *Elimination of American foulbrood without the use of drugs*, written by Mark Goodwin and published by the NBA as a revised version in 2006.

Meeting people and talking about bees adds to the experience. During one of the plenary sessions, I walked outside with Ed to talk further. We were joined by Randolph Furbert from Bermuda. Ed is a very interesting fellow, full of knowledge. He has dyslexia but it hasn't stopped him from making some significant contributions to the industry. Ed was one of the beekeepers who assessed the early queen breeding results for the Baton Rouge programme and has visited Europe a number of times to assist with breeding programmes.

Next year's EAS is being held in Guelph, Ontario at the University of Guelph. It's the first time the conference has been held in Canada for quite a while and their delegate said they were well into the planning for a very good conference. The Canadians have been at the forefront in the Americas for developing alternative varroa treatments. One can only learn from the experience. If you obtain a good crop this year, why not consider attending the EAS conference as part of a holiday trip to Canada.

NBA Life Member passes away

Arthur 'Kevin' Ecroyd, Life Member of the National Beekeepers Association, passed away peacefully at Dunstan Hospital, Clyde, on Friday, February 20, 2015, in his 87th year. A tribute to Kevin will be published in the April journal. We extend our condolences to wife Sunny, Stuart and Melanie and the Ecroyd family.



Kevin Ecroyd at the 2013 NBA Conference, Ashburton. Photo: Mary-Ann Lindsay.

Argentine ants in New Zealand hives

By James Harrison, Kiwitahi Honey Ltd

I am writing in regard to the rising levels of Argentine ants in some parts of our area (northwest Auckland), as well as hearing similar stories of Argentine ants in Northland and the Far North.

These ants are becoming a serious problem for some beekeepers now, as it seems they are widespread. The ants can overwhelm a hive and lead to the eventual death of the colony.

The ants will feed on both the honey and the brood within a hive: weak hives are especially vulnerable.

Upon coming across a hive with their bees out the front in a defensive mode, we opened the hive and noticed the bees had abandoned the brood as the ants had overwhelmed the hive and were eating the larvae (ignoring the honey).

A few days later we looked in the same hive: this time they had abandoned the brood in favour of eating the honey. I presume the ants are after foraging for either protein or carbohydrate specifically.

We have tried using various baits such as pastes and injection poisons, as well as industrial type ant sand, but to no avail. Although these products may knock the ants back a bit, they don't seem to be able to control them. The paste was initially taken up by the ants, but on returning a week or so later it appeared that the ants had wised up to the poison and were no longer taking it down, and the paste looked virtually untouched.

Overseas beekeepers will stand hive legs in pools of oil to eliminate contact with the ground, which is fine for one or two hives but not feasible on a commercial level. When an apiary has an ant infestation you are generally stuck between a rock and a hard place as moving the hive can potentially transport the ants to another apiary. Spreading them to orchards during pollination is another possibility. We have basically had to quarantine apiaries with the ants so as to reduce the spread.

I believe that these Argentine ants will be a major threat to New Zealand in the near future, not just to beekeepers. If anyone has a miracle cure or management system, I for one will be all ears. Contact me on 09 420 7609 or via www.kiwitahihoney.co.nz

Argentine ants attack a hive in northwest Auckland. Photo supplied by James Harrison.

Editor's note: Argentine ants have spread rapidly in New Zealand since establishing in Auckland in 1990. For more information, check the website for your local council or refer to these websites, among others:
http://www.biosecurity.govt.nz/pests/argentine-ant/control
http://argentineants.landcareresearch.co.nz/
http://www.doc.govt.nz/conservation/threats-and-impacts/animal-pests/animal-pests-a-z/argentine-ants/

Comments from Dr Phil Lester, School of Biological Sciences, Victoria University of Wellington

Argentine ants are a widespread pest and invasive species. They were first observed in New Zealand in Auckland during 1990 and have now spread as far south as Christchurch. These ants can be a major pest, especially in urban areas. In Argentina they are known as the sugar ant because of their love of sweet food.

If you have Argentine ants, you'll typically know them by the streaming river of ants that flood up your fruit trees to tend scale insects or aphids. They effectively farm these aphid or scale insects: the ants protect the aphids from predators like ladybeetles, and in return get a little bit of sweet aphid excrement as a reward. Massive and economically damaging populations of aphids or scale, and ants, can result. As James suggests, these ants have also been known to attack beehives raiding honey and killing brood. Serious bee losses from these ants have occurred in places like Florida.

Prevention is a lot easier than cure with these ants. The ants have a slow rate of natural spread, moving at most only a couple hundred meters per year. People are the usual mode of long-distance transport. Argentine ants are frequent passengers with compost, bark chips, or pot plants. They nest in this sort of material and will happily be moved around with just about any sort of rubbish. *So my advice is to be very cautious when you are moving anything near beehives.* ➔

Argentine ants on the outside of a hive. This photo, and the ones on the next page, were taken in January 2011 at a property in Gisborne. Photos courtesy of Barry Foster.

Argentine ants on honey frames. The ants didn't seem to take any honey: they were after the protein.

Before you move material, look for ants: especially the highways or rivers of ants that you typically see with Argentine ants. Another preventative method is to station your hives away from urban areas, away from building or disturbed areas that these ants seem to prefer.

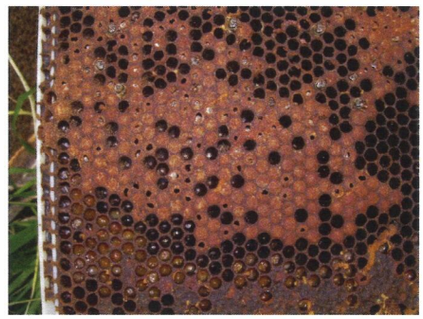
There are control options available once you have Argentine ants. Control typically involves toxic baits. To effectively control these ants, toxic baits need to be delivered to the entire colony including the queens, which are well hidden in their nests. The Xstinguish Ant Bait (http://www.flybusters.co.nz) has been developed for Argentine ants. I've never seen it attract bees (although I've never used it around beehives), but you should be cautious in your use of any toxin around beehives. You can squirt these baits in containers or under rocks that are inaccessible to bees but allow access to the much smaller ants. Don't expect, unfortunately, eradication using such baits. You'll typically see reinvasion from your sharing and friendly neighbours…

And whatever bait I've used, periodically these ants will seem to ignore it and just keep on doing whatever they are doing. There are other control methods available, like sand barrier or sticky substances the ants cannot cross. They might help. But these ants are very clever and will find a way around or through many obstacles.

My group at Victoria University has been looking at a number of control options for these ants, including pathogens. We've found these ants can host a range of viruses including the Kashmir bee virus. The use of pathogens to control these ants is a possibility, but is a long way off. In the interim, I'm sorry to say that we are stuck with this invader.

Comments from Frank Lindsay

I occasionally find these ants under the roof of a hive (between the roof and the hive mat or split board). I squash as many as possible. I then leave green leaves under the lid and the few ants left move on. Walnut leaves are an alternative treatment as they are poisonous. I'd also suggest treating the hive with formic acid to see if the acid either kills the ants or drives them out.



Brood destruction as a result of the invasion.

New products available

We have two new products available for sale on the NBA website.

The 'Love Our Kiwi Bees' tea towel makes a great gift, and it should be very popular at the conference and during Bee Aware Month.

The *Queen Bee* book has already been selling well, and is a helpful guide to the biology, rearing and breeding of queen bees.

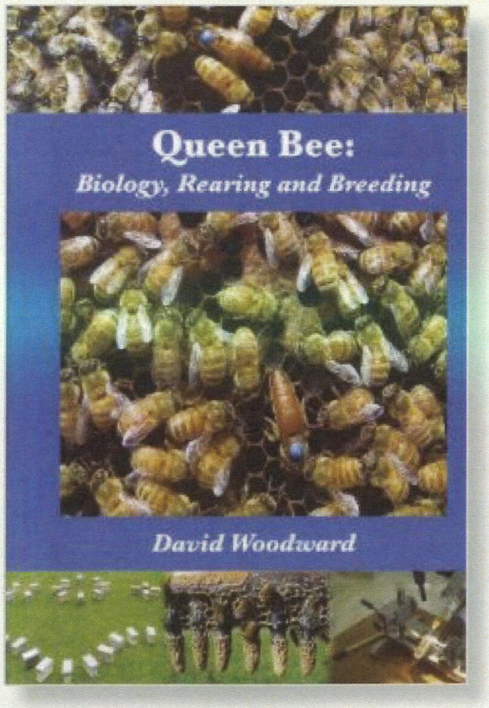
Queen Bee: Biology, Rearing and Breeding

$45.00

This title offers everything you ever wanted to know about the biology, rearing and breeding of queen bees. Divided into three major chapters with many sub-sections, Queen Bee is a definitive guide to the biology and breeding of queen bees. It includes:

Chapter One—Queen Bee Biology, Introduction, Castes, Anatomy & Lifecycle, Reproduction, Castes, Development, Egg Laying, Pheromones, and Diseases;

Chapter Two—Queen Bee Rearing Equipment, Grafting & non-Grafting, Capture & Transport, Swarming & Nucleus Hives, and Nutrition; and,



Chapter Three—Queen Bee Breeding, Genetics & Reproduction, Stock Selection & Improvement, Breeding Programmes, Instrumental Insemination, and Glossary.

Note: this title is not subject to trade discount.

Postage:
$5 within NZ | $12 to Australia

To order, visit http://www.nba.org.nz/shop/publications/queen-bee-biology-rearing-breeding/

'Love Our Kiwi Bees' tea towel

$14.95

Woven from 100% premium quality cotton, machine washable.

Dimensions: 50cm x 70cm

Designed with a hanger tape sewn into the corner for the useful option of hanging on a hook.

Postage:
$3 within NZ | $5 to Australia | $6 to the rest of the world.

To order, go to http://www.nba.org.nz/shop/products/love-kiwi-bees-tea-towel/

FROM THE COLONIES

Waikato Branch

The weather is still hot: our eyelashes are sweating even when taking the honey off! Luckily we have had two sites close to beaches so we have jumped in, clothes and all, after the harvest. The cicadas are starting to sing so autumn isn't far off. The bees are still humming away but on their last legs from all accounts.

The Waikato harvest so far looks better than usual. The manuka on Desert Road was like snow this year; just stunning, so those in there will be happy.

Conference update

Conference planning is going well. All the overseas speakers we have asked have accepted. Information about them, and the topics they are speaking on, should now be up on the website designated for the conference. Go to www.apicultureconference.co.nz and have a look, and keep an eye out for the conference registration material to be inserted in the April journal.

Bookings for the conference will be available from about 1 March onwards—DO it! Even if you are a 90-year-old beekeeper, every year there is something new and interesting to check out, not to mention just nattering to other beekeepers. Well worth it.

Happy harvesting, everyone, and keep safe with all that driving!

- Barbara Cahalane

Poverty Bay Branch

Honey harvest

With the main honey harvest almost over, most beekeepers are reporting an average to above-average manuka crop. Early sites did not produce as well due to the fickle weather in November and early December. Multifloral has flowed well over the long hot summer days. The hives are very heavy going into autumn.

Giant willow aphid

The giant willow aphid (*Tuberolachnus salignus*) has showed up again in Poverty Bay over the late January/early February period. With the wet weather we have had there is no great build-up of honeydew yet. I have not received any reports of bees gathering willowdew honey as they did in February last year.

Trees for Bees

Spring plantings have survived well over their first summer. The replanting is helping to make up for the losses over the last two seasons. The species chosen are due to flower in September and October to fill in the gap between the willow and clover flows. The larger trees produced a few flowers in their first season.

- Paul Badger, Branch President

Hawke's Bay Branch

Most of Hawke's Bay is getting pretty dry and the honey flow has finished in many areas. Other areas have had reasonable rainfall and may yet do a bit more. Clover has been the main source this year with some good harvests being reported from this crop.

I checked one of my coastal sites a few days ago where there was nothing but brown grass and fresh air for the bees to work. I was planning to start my requeening there but the bees were on a fairly good honey flow so I'll have to leave them for a while. Goodness only knows what they were working, as there were no visible flowers for miles, and no tutu either. It just goes to show that bees can still surprise you.

- John Berry, Branch President

Nelson Branch

It's still warm and sunny, which (when you aren't in a bee suit checking hives or removing honey) is quite pleasant. Unfortunately I expect most, like me, have not had the luxury of picking cooler times to work hives at this time of year. The few beekeepers I have managed to have conversations with have been hectic removing supers, as one would expect. Most appear to be getting a reasonable amount of honey, which is great.

The local Nelson NBA Branch is holding a meeting on 10 March. So it will be good to catch up with the few of the region's beekeepers and hear how all things bee-like are going.

Not much else to report at this time: hope all the hives continue to produce lots of honey. Keep up plenty of fluids and don't get dehydrated and dizzy, which happened to me not so long ago, but that's another story.

- Jason Smith

Otago Branch

The NBA Otago Branch field day was held in Lawrence on Sunday 19 October 2014. We enjoyed excellent presentations from Professor Alison Mercer of the Department of Zoology, University of Otago, Dr Mark Goodwin of Plant and Food Research, Allen McCaw, President of the Bee Products Standards Council (BPSC) and David McMillan of ApiServe Limited. The presentations were followed by a panel discussion and a general discussion led by Peter Sales.

It was a good meeting, and we all took home a great deal of knowledge.

We would like to thank the sponsors: Brian Pilley of Beeline, Russell Berry of Arataki Honey, and Peter and Susan Lyttle of New Zealand Beeswax.

Reporting on the crop, from Dunedin south it sounds to have been generally good but Central Otago has suffered badly from one of the hottest and driest Januaries on record. There was a good thyme crop earlier in the season for them though.

Bush crops on the Otago coast have been good in places with kamahi, manuka and some late rata reported doing well. Many 'manuka' areas produced great clover this year! After a poor crop in South Otago (last year especially), the return to better crops and continued good prices is very welcome.

- Tudor Caradoc-Davies,
Branch Secretary

Looking for a soft landing.
Photo: Christine Moeller, Te Aroha.

Responses to Federated Farmers

It is great that the NBA gives the opportunity for people to express their views through the NBA journal.

The comments made by Federated Farmers (FF) in the February 2015 journal regarding Ian Berry's letter to the editor (December 2014 journal) have prompted my comments below.

Ian made a straightforward suggestion to resolving the industry division that happened with the formation of FF Bees. His view to welcome the FF members (and others) back to the NBA to work together and strengthen the organisation that has been an integral part of the beekeeping industry for 100 years saves a lot of unnecessary expense and time commitment, with a unification project, that could be better utilised for real beekeeping issues.

GM issues

It is interesting that the letters to the editor from Mark Ross and John Hartnell (both representing FF) appear to highlight differences of opinion with the GM issue. John Hartnell's letter states, "FFNZ Bees are absolutely opposed to their introduction" while the letter from Mark Ross states, "As a general statement, Federated Farmers does see the potential that gene technology has to benefit New Zealand producers, providing appropriate controls exist ...".

Controls on beneficial plants

Whilst I acknowledge the Trees for Bees programme, farmers are continuing to remove plants beneficial to bees faster than those who develop replacement pollen sources. The Trees for Bees project is disappointing that it is selective in what plants are included in the study. Research was formerly an investigation of facts and conclusions reached which were independent of prejudices.

The decision not to investigate the benefit to bees of plants that some consider 'weeds' (i.e., gorse and broom) disadvantages the beekeeping industry by not providing the 'evidence' to support a review of the 'weed' status of such plants. In the Mid-Canterbury region, gorse and broom are usually controlled in the form of fences, which cause little harm to the environment and offer benefits to the farmer for stock shelter. And of course, the beekeeper benefits from the twice-yearly flowering of gorse, which provides much-needed pollen in the early spring and later in the autumn.

Pesticides and their impact on bees

Ever since the Canterbury bee deaths from pesticides in 1998, I have been actively involved in the protection of bees from chemical damage, including submitting to ERMA/EPA applications for approval of chemicals. FF has only recently started submitting to some EPA applications.

I recall in 2013 an early involvement of FF, when FF appeared at pre-hearing meetings as a support organisation to the applicant, Dow, for the chemical insecticide sulfoxaflor. The applicant proposed novel conditions to allow the product to be applied, to flowering plants, one hour prior to the temperature reaching 12 degrees centigrade; this was apparently supported by the FF group.

Fortunately the NBA presented evidence at the hearing that suggested the control, if accepted, would pose an unacceptable risk to bees (and other pollinators) and would result in a ridiculous situation for both the beekeepers and chemical manufacturers, as the product would not be able to be used during the summer growing season, which would generally be outside the proposed application temperature (refer to *The New Zealand BeeKeeper* November 2013, page 14).

Being at the table

John Hartnell's letter to the editor in the February 2015 journal is entitled 'At the table, or on the menu?' The NBA has been proactive in including FF members (and others) to be at the NBA table: conference is a great example.

The NBA is recognised as the industry body for beekeeping and meets the criteria for running commodity and biosecurity levies if the industry signifies support for such.

There has been closer co-operation between NBA/FF Bees. It would seem logical that some amalgamation take place to create efficiencies within the industry administration, rather than empire building of separate bodies (with similar views) requiring an increased number of personnel devoting time and effort to industry. Working together will enable NBA to utilise the individual skills that members have to represent the industry on a national basis.

As Ian Berry suggests, everybody is welcome to dine at the NBA table (as is happening at present). I trust the NBA won't become the meal and that our guests will not depart with the silverware. Maybe someday they will 'bring a plate' and assist with the washing the dishes, as would be expected when they take their place as contributing members of the beekeeping family.

- Roger Bray

Another response

I am responding to comments from John Hartnell about Ian Berry in the February journal.

Ian in his lifetime has probably done more for the New Zealand beekeeping industry than anybody else. Ian has tremendous beekeeping and business skills, which have helped to develop Arataki Honey into the very strong company it is today. He is a Trustee of the Honey Industry Trust and personally is a strong supporter of keeping new bee diseases out of New Zealand, which Federated Farmers, including John Hartnell, has done very little to support.

Let the leading beekeepers like Ian get on with promoting the NBA, so it serves the beekeeping industry of New Zealand even better than it has over the last 100 years.

Just remember that New Zealand beekeeping is more profitable than anywhere else in the world. The NBA has played a very important part in the profitability of its members. →

Ian still plays an active part in the NBA and will support others who strive to improve NBA services to its members and maintain the NBA being the primary representative of the New Zealand beekeeping industry.

- Russell Berry

[Editor's note: these are personal opinions rather than those of NBA's Executive Council.]

Poor service from extractor suppliers

Why in New Zealand are we given such poor service when buying new plant for our honey houses?

Over the last 2–3 years I have spoken to many beekeepers who have been let down in the past by two of our leading manufacturers of plants, both of which made many delivery promises and do not deliver. Why? Do they not know the cost and enormous stress they put on us as beekeepers by not doing what they promise?

Some of our offshore suppliers seem no better, I'm afraid, based on my own experiences. Last year we had a very poor crop in many parts of Southland: personally our own crop was down by 75%, which was really putting on the financial squeeze. Despite this, we decided to put up our own honey house ready for the coming season.

Scraping together our last $5 note, I booked in to go to the Apiculture Industry conference in Wanganui to talk to suppliers about equipment for our soon-to-be-built honey house. In Wanganui I met Chris and Juhani from Paradise Honey in Finland and had a good look at one of their extraction lines.

After returning home from conference, I spoke with our accountant and bank manager, drew up plans for the brand-spanking-new honey house complete with power supply. After several emails and phone calls back and forwards to Finland, I ordered a complete 52-frame extraction line for delivery to New Zealand between 10–20 November 2014. I was assured that they could easily do this, and with this confidence I put down a one-third deposit on one of these plants.
Unfortunately, this was the high point, as now we are in early February and after possibly 15–20 phone calls and dozens of e-mails, we have still not received any plant, or even a bill of lading to confirm that it has been sent despite many promises.

I have tried our utmost to resolve the situation, and made it perfectly clear to Paradise Honey that I expected Juhani (the owner of the business) to contact me personally to sort out the very poor service we have received. Despite several emails to this effect, and another phone call, they have failed to do so to date.

It is very disappointing to be treated this way by our suppliers. We are investing up to $250,000, of which the majority we are paying $20,000 interest on annually from the bank. Despite all promises and assurances we have no plant to extract honey this year, and to add insult to injury, we still are having to pay another beekeeper to extract our honey again this year (we are extremely grateful for the support of local beekeepers to do this for us).
It appears from talking to another beekeeper recently that they have had a similar experience with Paradise Honey and their New Zealand agent. Others I have spoken to have had similar experiences with the other two mentioned main suppliers. (Maybe reputable firms such as Ceracell or Ecroyd should branch out into building customised honey plants.)

I would be very interested in hearing other beekeepers' experiences and views on how to overcome these sort of difficulties: either directly or through *The New Zealand BeeKeeper* in the months to come.

In all three mentioned cases, the quality of the equipment and how well it performs is not in question at all (as that is why we are in the situation of having to order from these people), but the quality of their service and willingness to resolve the problems that they themselves have caused is at issue.

- Grant Hayes
Catlins Honey, Invercargill

L'Apis Excerpt available

The new issue of *L'Apis Excerpt* (The Beekeeping Magazine) for January–February–March (n. 1, 2015) is now available online FREE at the website http://www.lapisonline.it/index.php/en/l-apis-excerpt

L'Apis Excerpt is the online magazine composed of material collected and translated from *L'Apis* suitable for an international audience.

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Thoughts about hive movements and costs

A recent circular letter mentioned that if an unregistered apiary is located, the beekeeper concerned will lose his or her DECA.

I realise the main reason for this ruling relates more to income for the AFB disease control programme rather than actual disease control, as most, if not all commercial beekeepers possess the required DECA. Assuming the DECA is achieving the disease control that is the aim, removing the DECA is only using a 'big stick' system to solve a minor problem.

Present-day beekeeping is requiring a lot of hive movements during the year. As beekeepers are very busy, it is easy to overlook registering an apiary. One problem is that the apiary charge is based on apiary numbers, rather than actual hive numbers. This allows beekeepers who operate large apiaries (such as those on beech honeydew) to pay less than others with similar numbers of hives.

We need to look again at the AFB charge, and we also need beekeepers to advise AsureQuality of the number of hives being operated and the general location, or locations. As far as hive inspections go, as many apiaries are in very isolated locations or behind locked gates; therefore in order to do a disease check, the beekeeper really needs to accompany the person doing this check.

At present, because we have to move our hives a lot to keep up with native flora flows, we have registered our apiaries as seasonal apiaries. This means that we are paying far more than we should do compared with beekeepers able to run larger apiaries on permanent sites.

Looking at AFB control, the present system doesn't appear to be achieving its purpose of actually dropping the disease level enough, as it originally was devised to hopefully eliminate AFB from New Zealand.

As beekeeping has such an important role in the New Zealand economy, perhaps Government needs to invest more into disease control, rather than expecting the beekeepers to shoulder most of the costs. We probably will see new diseases adding to our present ones, and a collapsed beekeeping industry would be a disaster.

- Gary Jeffery

[Editor's note: Apiary registration is required for honey traceback.]

Honey from kanuka

On looking at some maps showing the vegetation in New Zealand, I noticed that there are vast areas covered with kanuka trees.

Kanuka trees yield honey—I know because I have been supplied by beekeepers with many samples of it for my research over the years.

Although monofloral kanuka honey has no non-peroxide antibacterial activity like manuka honey has, it does have a high level of antibacterial activity due to hydrogen peroxide. There must be vast amounts of kanuka nectar available to be harvested by beekeepers, yet, other than a very small amount packed in tubes as a pharmaceutical product, I have never come across kanuka honey on sale like you see honey from New Zealand's other nectar sources. There is not even been a standard set for kanuka honey by the Bee Products Standards Council (BPSC), which indicates that it is not considered to be a commercial variety of honey. I would have expected it to be a variety of honey that would be quite popular with consumers, as it tastes quite a bit like manuka honey.

- Peter Molan

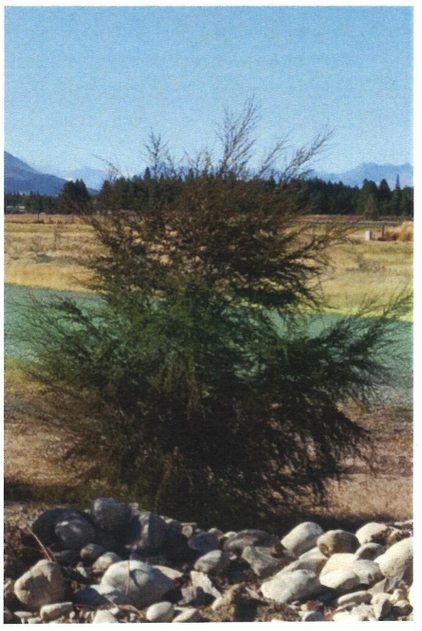


Photo: Dave Murphy, Twizel

How to select a breeder queen

By Gary Jeffery, Mountain Beech Apiaries, Westport

Selecting the perfect queen bee to suit your needs takes patience and good observation. I like to use what I call the ZORRO method.

In the spring, I check each hive and if a hive winters well, with a nice brood nest, I write TEST on the front of the hive: then I know that nosema is not a problem.

Later on, when going through the hive again, I might see that there is no chalkbrood, so will underline the TEST. Never breed from a hive with chalkbrood in the drone brood. Chalkbrood is less common in worker brood.

Nearer to clover flowering time, sometimes sacbrood can show up in the worker brood. If no sacbrood is evident when it appears in other hives, underline TEST once again.

Avoid breeding from any hive where paralysis is seen in the form of shiny, shaky bees. Shiny bees are sometimes the result of robbing, but then there is no shaking. Bees with paralysis are often seen on the top bars when the hive is opened.

Once the flow is close to starting, underline TEST once again if the hive doesn't start swarm cells, even if a bit overcrowded. (This assumes that the queen is over a year old.) Never breed from a hive that swarms as the daughters will also tend to swarm. Look for queens that supersede in the autumn, when they are two (or preferably three) years old.

During the honey flow, underline TEST once again if the crop is well in excess of that of neighbouring hives. Our bees do tend to rob, but this probably is related to our breeding for bees that work beech honeydew better than others. Our bees also work in colder conditions as are found in the forests.

Toward autumn, look for bees that will pack honey down around the brood early, as such a hive will winter over with less risk of starvation. Underline TEST once again.

If you are into comb honey production, underline those hives that produce nice, even combs with a white capping to suit the market. In the past I have found that bees that seem to nearly overcap the sealed honey were better comb honey producers. They seem to like drawing wax. Avoid the ones with burr combs.

At the end of the season you should have several hives with a number of the TEST wording underlined. Then comes the ZORRO method. If the bees do not sit quietly on the combs in all weather conditions, and particularly if they tend to be stingy, then put a line through the TEST and underlining, and that is it for that queen.

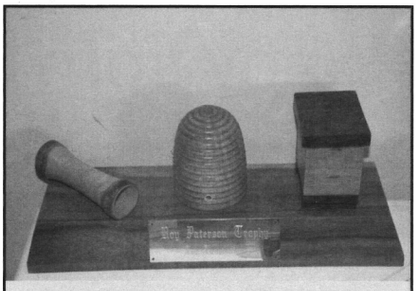
However, you still have one more test to be certain of having the ideal queen for your purposes, particularly if you are involved with pollination. Put the potential breeder on the back of your truck and go for a ride for a while. You will find that two things could happen. The first is the bees will come out of the entrance and tend to fly off and attack passers-by if you stop. The other type of bee will disappear inside and if the lid is lifted, the bees will be seen clustered in the top frames, under the roof. Breed from this type and you will find that moving your hives is a piece of cake.

In selecting your breeder queen, there is little point in measuring tongue length, wing venation (the arrangement of veins in the wing), etc in an effort to breed a 'pure' breed, as previous imports have resulted in New Zealand having a blend of many European strains. The early Italian strain had worker bees with only three yellow bands and the drones were quite dark on the top of the abdomen, with yellow on the underside. The very yellow strains look nice, but often came from places like Egypt and Cyprus and can have a quite nasty temperament.

All we want is a nice quiet bee that we can handle with little smoke or protection in most conditions, and will still collect a good crop of honey. There's little point in having a big crop you cannot remove because of nasty, stinging bees. I remember the first bees I came across in Fiji: I had to put on my veil, etc before opening the truck door, and there was no chance of taking off honey from them. Probably this was the British bee brought to Fiji early on?

Try to avoid inbreeding your bees too much, as bees have a different genetic system to us. Bees have multiple genes relating to sex. If the strain is too pure, the result will be very patchy brood instead of the nice full combs that we want. A degree of hybrid vigour is needed.

If you have done your selection properly, the bees will perform to your satisfaction. By using a judicious selection process, we have so far managed to eliminate most common diseases. Varroa control is next on our programme. We hope we don't have to eliminate European foulbrood as well.



Prepare for the Conference competitions!

Now is a good time to start preparing entries for the national honey show, the Ecroyd/Apiculture Industry photography competition, and the Roy Paterson Trophy, all of which will be held at the New Zealand Apiculture Conference, Wairakei Resort Taupo, June 2015.

Visit www.nba.org.nz/events for schedules, rules and entry forms for these competitions.

Droughts and pests

By Frank Lindsay, NBA Life Member

It's been very dry throughout most of the country, with some eastern areas being declared to be in drought.

We have had hardly any decent rain since early December, which is unusual for Wellington, and has caused a short, heavy honey flow. Hives with honey boxes on were filled in a couple of weeks; hives without sufficient honey supers swarmed.

In late January, the honey flow stopped abruptly as if a tap were turned off, even though the last pohutukawa was still flowering. The bees suddenly stopped fanning one evening, and the next day they started sniffing around the honey room.

The short, sharp flow caused the bees to pack out the brood area, reducing the queens' laying area to just four frames or fewer. This sudden reduction in brood area also means that the mites that have been building up since the last treatment have fewer cells to choose from. They concentrate into the few developing larvae, severely damaging them. Without immediate protection from a miticide, a colony could be history in another month.

The bees basically sat in their nuc hives, with just the water carriers going back and forward to a bucket of willow cuttings under a tape. Each day in the early afternoon, all the new field bees would fly on their orientation flights for half an hour, then the hives would settle down again. Despite the dry conditions, koromiko, fennel, eucalyptus and a few late-flowering garden plants were still available to the bees, but they took no action.

Generally during March I would expect my bees to bring in nectar from pennyroyal and lacebark before the season closes for good, but most of the ground sources in this area have dried off and have been eaten by stock. A late swarm, which I had fed twice to get the bees to build comb, starved. What a shock.

After a shower of rain, the gorse started flowering and the hives came to life again, bringing in loads of three different-coloured pollens. Hopefully with more rain and a good show of late-flowering sources, the hives will start to produce winter bees.

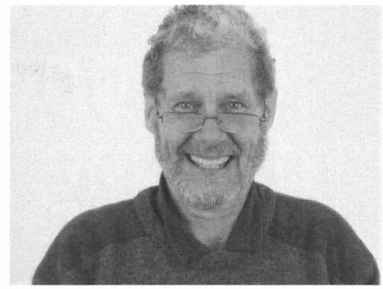
Treat and monitor for varroa

It's normally difficult to see mites in a hive but if you can see them on bees or the frame surface, it's a sure sign that the hive is about to collapse. External signs are bees crawling in the grass away from the hive, unable to fly. They may look fully developed or have deformed wings but this is a sure sign of crawling death. Treat immediately.

> "...if you can see mites on bees or the frame surface, … the hive is about to collapse."

Hopefully most will now have started their varroa treatments, or at least applied something to knock down mite numbers until a full treatment can be applied. Give the hive a quick treatment with formic acid onto a paper towel on the bottom board or above the brood nest, or half a wafer of ApiLife VAR® on top of the brood frames or a Mite-Away Quick Strip™. Another alternative is to use a fogger to apply food grade mineral oil (FGMO) to knock down phoretic mites, thus reducing their impact on the next generation of bees.

Whatever you use, monitor the results. Don't take it as read that you have treated the hives successfully when using an alternative treatment. Fork out 100 pink-eyed drone larvae or use an alcohol wash containing 300 bees and count the mites. Treat immediately any hive that is over three mites per 100



bees in brood or nine mites per 300 bees in a wash. At the end of the treatment, monitor again so that there is less than one mite in a 100 bees in brood or less than one mite in a wash of 300 bees.

Those with mesh bottom boards should try to achieve less than one mite dropping per day over a seven-day period following a full treatment. And don't think that is the end of your treatments, because your bees will be out trying to rob honey from other hives if nothing is flowering. That hive could be a feral that's dying from mites so within a few weeks, the mite population will be back up to risk levels again.

Robbing season is here

It's important to know what robbing looks like. If you have several hives, it's fairly easy. One hive in full flight when others aren't is a sign they have found a source and at this time of the year, it's generally another hive. Mark the hive for a more detailed inspection for disease when the first frost occurs.

For those on the receiving end, the hive will be very active with bees coming and going. Look carefully at the entrance. Are the bees bringing in pollen? If so, that's not robbing. If, however, the bees coming in have abdomens shorter than those leaving, and those leaving crawl up the front of the hive before flying, then the hive is being robbed.

You will see the extended abdomen is also slightly lighter, indicating there is honey in the stomach. You may also observe the odd defender surrounded by bees pulling at it, similar to bees that drift on to the entrance of the wrong hive, or there may be just straight-out fighting.

Close the hive entrance down to a couple of bee widths and block it completely using

Continued on page 29

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grass. If you are in an urban area, turn on a sprinkler to wet down the hive and persuade the robbing bees to go home.

In the evening, check the hive. Look for eggs. Generally something will have happened to the queen, breaking down the cohesion of the hive. The stored honey is quickly depleted: open cappings will look rough and there will be large flakes of wax on the bottom board. Bees can rob out a super of honey in a couple of days, so remove all but a couple of frames for the surviving bees to feed off.

If you can't see eggs, look for a recently emerged queen cell along the edges of the brood frames, indicating a recent supersedure. (The hive should still contain sealed brood; otherwise, it indicates a lost queen and the hive will be queenless.) If the hive still contains half a box of bees, remove the hive completely and place an empty super in the hive's original position. The field bees robbing the hive will return to it for the next week looking for honey and will gradually stop looking.

In the meantime, move the hive more than 100 metres away and put on a robbing screen over the entrance. A simple screen can be made with a square of fly screen. Staple the fly screen across the top and bottom of the entrance and secure it so it creates a tunnel with a small opening at one end, perhaps 100–150 mm away from the present entrance.

Some books show a 150 x 150 x 10 mm square frame that can be screwed or fitted over the entrance, covered with a screen. An entrance of two bee spaces is created at the lower edge so that the hive bees can remove any dead bees.

Robbing bees. Photo: Frank Lindsay.

Robber bees will follow the scent of the hive to the entrance but won't be able to get past the screen, while the hive bees will soon learn that the entrance is now out to the side and will fly normally.

Normally this screen works but bees are very cunning. Sometimes workers will land on the screen and beg the bees inside to feed them and over time, these bees will empty the hive of reserves. Some beekeepers protect their nucs with double screens, with another on top of the original, but this second screen is more than a bee's tongue length apart so the outside bees can't touch the bees inside.

Wasp control

We can also use the same type of screen to combat wasps. Like bees, wasps require nectar to feed their young. They have been visiting flowers all through the spring and summer collecting nectar, but now turn to robbing hives for their nectar supply when the flow stops. We try to dissuade them by closing down entrances and putting out homemade jam in a container under a hive. Once the wasps are feeding on this in numbers, we return a day or two later and put an insecticide around the bait so the wasps have to walk through it to get to the jam. They take it up the insecticide on their bodies and when they return to their nest, they clean themselves and are poisoned.

Some beekeepers are using a pet flea preparation with good results. Usually once an insecticide is added, I stay in the apiary working the hives but remove the insecticide when leaving, as I don't want my bees visiting the poisoned baits.

By far the best way to control wasps is to find and destroy their nests. They usually make nests in banks and along gullies and will be within 500 metres of the hive. You can see them flying late into the evening when the sun is low after bees have ceased flying for the day.

If you can't find the nest or reduce their numbers, move the hives to a different location with fewer wasps. Hopefully this year it won't be a bad wasp robbing season: the wet spring delayed the queen wasps establishing their nests, so they won't have built up to plague numbers and the bees will be able to fend off the odd robber wasp.

Nests can easily be destroyed by pushing a large plastic bottle containing diesel into the entrance. Leave it in place for a couple of days to fumigate the nest.

Caution: wasps are very sensitive to vibrations (perhaps a little more than bees) so will detect your footsteps and will be out quickly to meet you. Walk on tiptoes to reduce your footstep vibrations and use a little smoke to control the wasps at the entrance, just as you would with bees. However, unlike bees, wasps will press home their attack if disturbed and they can pump venom on all surfaces of your suit. Also, wasp stings hurt a lot more than bee stings and last much longer.

You may see a lot of bee activity in the early afternoon at some hive entrances. Normally in times of no nectar flow, only a few bees will be flying, bringing water back to the hive. But in the mid-afternoon, you may suddenly see several hundred bees flying out of the hive in ever-increasing circles. These are the next crop of field bees learning the location of their hive. This activity generally lasts for 15–30 minutes, then subsides to just a few bees flying again: it is a normal function of a healthy hive.

Queen mating and other winter preparations

I have also been making five-frame nucs to get queens mated for wintering. I was very pleased with the standard of queen cells I received from the queen breeder. Breeders put a lot of effort into producing good, long queen cells and queens and hopefully I'll have enough drones to do the rest of the job.

Preparing nucs and introducing the queens (or queen cells) is very important. If the bees are locked into the nucs for 48 hours after putting in the protected queen cells or mated queen, the bees quickly settle down and stay put. I placed the nucs in heavy shade and gave each a squirt of water through the vent hole to keep them hydrated. After the queens emerged from the cells, I put the nucs out into the apiaries, which had a frame of drone brood in each hive. Mating nucs can be made out of anything. Take an old chocolate box, add a piece of cob containing honey, then add a cell and a cup of nurse bees. Lock up until the new queen has emerged. (Reference: Chris Dawson lecture, 1979). →

If you are putting in mated queens, it's a good idea to leave queens in their shipping cage in the hive for three to five days before removing the plug over the candy. This allows the bees to get used to the queen and gives you time to spot any queen cells they are developing. You can spot these emergency cells around the edge of the frame where eggs or young larvae were. Rub or dig out those filled with royal jelly; otherwise your purchased queen will be superseded by an emergency queen in a few weeks.

Now is also a good time to access your apiary sites. In a drought, boggy areas will continue to produce lotus major and perhaps clover. In some urban areas eucalyptus is flowering, thus continuing the flow. These sites are ideal for mating queens and producing nucs while a flow is on. During the flow, full-sized hives will generally leave the nucs alone. This year I haven't taken any risks and have stapled fly screen over the nuc entrances. With luck, this will discourage any robber bees from trying to steal the nucs' honey reserves.
Most beekeepers underestimate the number of drones needed to mate with queens. Drones are reasonably fragile—perhaps 30% of those produced never make it to full maturity—and then some take off for parts unknown to mate with somebody else's queens.

We should all try to take some nucs through the winter ready for the spring. They can be used to replace any hives that die, or can be sold if not required. An early five-frame nuc can build into a production colony in the spring. The most important point, which I emphasise repeatedly, is that no matter what the size of the hive, it should be full of bees covering all frames going into winter. This enables the bees to regulate their temperature and successfully winter over.

Things to do this month

Remove all comb honey frames. Remove and extract surplus honey—those frames that are not fully capped should be shaken to make sure the honey is dry. Otherwise, leave it for the bees or dry it further in the honey house using fans and a dehumidifier (although with the drought, this most probably is unnecessary).

Don't forget to do an AFB check before removing any honey. If bees are robbing, mark the supers and check the hives once the honey is off. Return any honey supers to diseased hives and burn them.

Requeen hives. Now is the best time to get queens mated while it's still warm and there are plenty of drones about. Queen producers should also have mated queens on hand if required.

In some areas it's time to winter down hives. Replace any woodware that requires attention. Keep an eye out for wasps, and close entrances down so the bees are better able to defend the hives against them and to stop mice getting into your hives.

Monitor mite levels when miticide treatments have been completed. Results with organic treatments can differ from hive to hive.

HEALTH AND SAFETY

Minister welcomes launch of *Safer Farms*

Media release from Hon Michael Woodhouse, Minister for Workplace Relations and Safety, 9 February 2015

Workplace Relations and Safety Minister Michael Woodhouse today welcomed the launch of the government's *Safer Farms* programme.

Safer Farms is a multi-year programme designed by farmers and the wider agricultural sector, WorkSafe New Zealand and the Accident Compensation Corporation (ACC).

"More people die working on farms than in any other industry in New Zealand and too many are seriously injured. *Safer Farms* aims to change that," Mr Woodhouse says.

"*Safer Farms* is a new way of tackling a long standing problem hurting rural New Zealand. It's about education, awareness and support for rural communities."

120 people have been killed working on our farms since 2008, with four times as many fatalities last year compared to the forestry or construction industries.

"The death and injury rate behind the farm gate is simply unacceptable. Someone is killed every fortnight - this needs to change.

"However the number of deaths and injuries on farms won't be reduced by the Government sending out more inspectors. Only farmers can directly influence this toll and *Safer Farms* aims to help them do this by finding health and safety solutions that work.

"Farmers have told us they want more information and engagement, so *Safer Farms* will work with farmers and rural communities to manage their own health and safety."

Safer Farms takes the health and safety message directly to rural communities—through rural retailer education, school programmes, 'how to' sessions at field days, and rural industry groups who we will help to provide onsite training.

"The government is committed to reducing workplace death and serious injury and *Safer Farms* will help us achieve this in the farming industry, while maintaining the quality and production of our primary industries which contribute significantly to our economy."

The *Safer Farms* programme includes an easy-to-use toolkit and a comprehensive online resource—www.saferfarms.org.nz—so that farmers have clear health and safety advice, and information.

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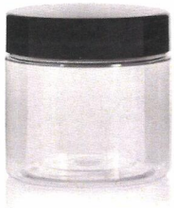
If your details have changed, please email editor@nba.org.nz and secretary@nba.org.nz so that we can update your details in the journal and on the NBA website www.nba.org.nz.

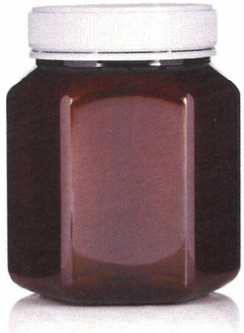


360ml Round Pot

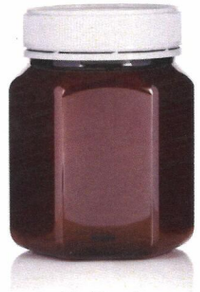
500gm Round Jar

340gm Round Jar
(coming soon)

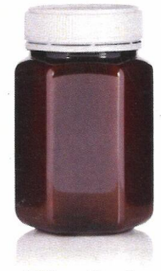
250gm Round Jar



2kg Hex Jar

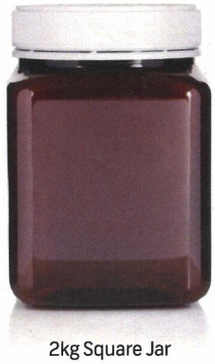


1kg Hex Jar



500gm Hex Jar

250gm Hex Jar



2kg Square Jar

1kg Square Jar

500gm Square Jar

250gm Square Jar

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No supply contracts are required.

Pharmapac follows well defined parameters of quality, conforming to various national and international standards. As these standards change, we work with our suppliers to continue to meet these requirements.

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