The NEW ZEALAND BeeKeeper

Celebrate Bee Aware Month

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Email them to editor@nba.org.nz

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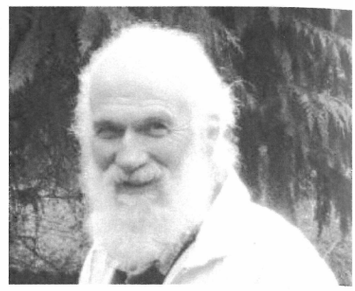
Reflections on recent publications

By Ricki Leahy, NBA President



Perhaps the most interesting recent development was the release on 31 July of the *Interim Labelling Guide for Mānuka Honey* by the Ministry for Primary Industries (MPI).

Although it is an interim guide, the information contained will not change significantly and so will be useful for any future marketing and labelling strategies.

In early February we were advised that this Guidance Document would be written to give us a 'heads up' on what we should expect in order to comply with mānuka honey labelling requirements. It possibly wasn't quite what some of us were expecting and I have heard all sorts of comments; however, I do believe that the information in the guide is very well presented. I advise all who may be affected to take the time to read it very carefully.

One of the main points made in the interim guide is that therapeutic claims such as 'Non-Peroxide activity', 'Peroxide Activity', 'Total Activity' and 'Active' should be removed from labels as therapeutic claims are prohibited on food products and associated advertising. We should all be very aware that all labels on packs for retail sale will need to comply with Standard 1.2.7 of the Australia New Zealand Food Standards Code from 18 January 2016, at which time these guidelines will be enforced. *Note that advertising must also comply fully.* The requirement for removal of any non-compliant stock on shop shelves is made quite clear and with honey having the shelf life that it does, we should all start thinking about the labels we use on our honey packs from now on.

Go to page 9 for further background from MPI's Deputy Director General Scott Gallacher.

Briefing on the health of bees

Another interesting report is entitled *Briefing on the health of bees,* presented in late July to the House of Representatives by Parliament's Primary Production Committee. The information for the report was prepared by MPI. As far as I am aware, this report did not include any input from industry, which is unfortunate. Although the report contained some factual errors and some opinions at variance with those of most beekeepers, it is encouraging to have the significance of our industry considered at such a high level.

Especially of concern is the lack of appreciation shown to the problems beekeepers have with surfactants, and indeed also the threat that neonicotinoids impose on us. On the other hand, it's great that the importance of a Bee Health Survey is recognised. An ongoing survey will recognise future threats that will then be convincingly determined with factual data. These differences in opinion merely highlight the fact that beekeepers still have a lot of work to do, which I assume will be ongoing, in protecting our vulnerable livestock from the ravages of our modern-world chemical farming practices. It is healthy to have certain differences in opinion, as it makes us all stronger in our resolve to reach consensus.

> "...we should all start thinking about the labels we use on our honey packs..."

The report includes a list of bullet points of how MPI is particularly supporting the bee industry, which makes impressive reading. These activities include biosecurity protection, review and approval of the AFB PMP, colony loss survey, researching baseline microbial flora of bees, co-funding the apiary register, developing import health standards, facilitating market access and honey residue testing, export certifications, SFF programmes including Trees for Bees and others, operating the Primary Growth Partnerships to develop a science basis for manuka husbandry, support in study of wasps, participating in the Bee Products Standards Council, developing a mānuka honey labelling guideline and working with the industry on the GIA. That is a lot of support that we should be aware of and not just take for granted.

Website upgrade

We are in the process of rebuilding our NBA website. The plan is to have a much simplified, cleaner and more current site. Apparently it is very old and clunky and overdue for an upgrade. It is also intended to budget funds each year to ensure it keeps updated with someone delegated to the task.

Bee Aware Month (BAM)

September is Bee Aware Month, in which the NBA urges all New Zealanders to 'Love our Kiwi bees' and 'Be Good to Bees Because' of all the nice honey they make and all the important pollinating work they do. A special note of appreciation to our BAM partners De Winkel, Palmers Gardenworld and Excelso Roastery from Tauranga, all of whom are donating proceeds to BAM.

Please read the NBA Management Team's report on page 11 to learn about companies who are currently working with us on BAM activities, some of whom are also donating a percentage of their sales to the NBA. A big thank you to you all and let's hope the rest of Bee Aware Month is a huge success.

It's definitely still winter as I write this with those 'colderlies' drifting on through. But those odd days with warm, sunny afternoons are giving the bees the opportunity to gather fresh pollen and presumably get the brood nests building up. It's always very good to have fresh young bees early in the season. Happy beekeeping.

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SHB a challenge, not a threat

By Quentin Chollet, Apiculture Officer, AsureQuality Limited, Lincoln. E-mail: quentin.chollet@asurequality.com

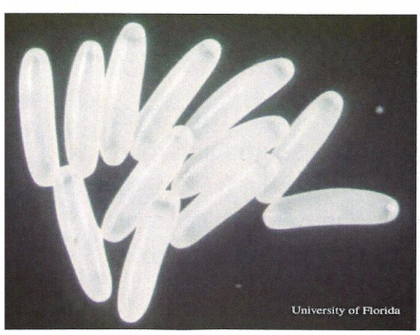
The small hive beetle (SHB) is considered to be one of the main threats to the worldwide beekeeping industry. This pest has the potential to destroy significant numbers of bee colonies.

The threat to New Zealand relates to its strong reproductive capacity and its ability to withstand long-distance travel. As SHB could arrive in New Zealand anytime (it is already in Australia!), the New Zealand beekeeping industry needs to be ready to handle this challenging pest.

What is the small hive beetle?

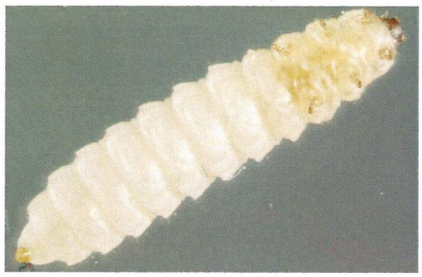
SHB *(Aethina tumida)* is from the coleopteran order and is naturally present in sub-Saharan Africa. SHB develops from egg to adult form through a process of metamorphosis composed of four stages, described below.

Temperature and humidity are both key factors for their development: a minimum of 10°C is required and conditions above 15.5°C and 50 % humidity promote beetle activity at all stages. Adults can lay up to 2,000 eggs, and can produce up to five generations within one year. ***Therefore, a few beetles may produce severe infestation very quickly.*** Under laboratory conditions, 80 individuals can become 36,000 by day 63! (Annand, 2008).



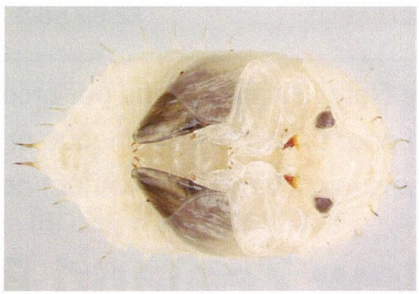
Eggs of the small hive beetle.
Photo: Josephine Ratikan, University of Florida.

Stage 1: Egg
Duration: Eggs hatch after 2–6 days.
Location: crevices or combs containing pollen or brood, preferentially where the bees cannot reach.
Length: 1.4 mm/Width: 0.26 mm.
Appearance: pearly white.
Most fragile stage of development.



Larva of the small hive beetle, ventral view.
Photo: Josephine Ratikan, University of Florida.

Stage 2: Larvae
Duration: 8–29 days.
Location: within the beehive.
Length: 9.5 mm/Width: 1.6 mm
Appearance: White, worm-like.
Feeds on honey, pollen stores and developing brood.



Pupa of a female small hive beetle.
Photo: Lyle J. Buss, University of Florida.

Stage 3: Pupae
Duration: 8–84 days.
Location: Takes place in the ground around the hive.
Appearance: begins white then darkens as exoskeleton forms.
Vulnerable time for SHB.

Stage 4: Adults
Duration: up to 6 months.
Length: 5–7 mm/Width: 3–4.5 mm/Weight: 13 mg.
Colour: light brown, getting darker with age.
Can survive for nine days without food or water.

Dorsal view of an adult male small hive beetle.
Photo: Lyle J. Buss, University of Florida.

What damage can SHB cause?

Considered as a minor pest in its native region, SHB is responsible for important biological and economic damage in areas where it has become endemic. SHB can be thought of as an aggressive scavenger and an opportunist insect that preferentially invades honey bee colonies.

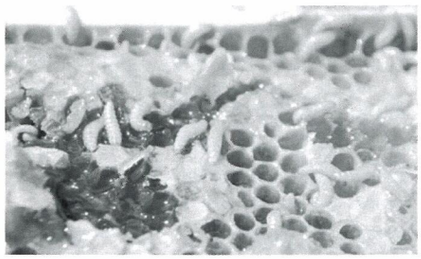
The population will increase rather quickly (growth speed will depend on a combination of factors such as the strength of the beehive, weather conditions and soil structure). Beetle larvae are responsible for massive damage within the beehive: they burrow through combs and feed on pollen and wax, but will also eat honey, honey bee eggs and larvae.

Larvae will move around and about the beehive, defecating and contaminating honey with specific yeast *(Kodamea ohmeri)* that causes the honey to ferment and results in a slimy mess, both to hives in the field or stored supers in honey houses. Fermented honey is described as smelling of decaying orange and is unfit for human consumption. That yeast is also very similar to bee alarm pheromone and acts as a repellent to bees.

In the US state of Florida, 20,000 hives were lost in the first two years of infection.

A mass exodus of larvae will follow, eventually resulting in pupation in the soil adjacent to the hive and emergence of a great number of SHB, re-infesting the same colony or looking for a new hive to infest.

If the bee colony is not strong enough, the queen will stop laying and the colony will abscond from the hive.



Honey comb showing fermenting honey and other damage caused by larvae of the SHB. Photo: Mark Dykes, University of Florida.

SHB's worldwide journey

SHB established widely beyond its native area including the USA (since 1996), Australia (since 2002), Jamaica (since 2005), Mexico (2007) and Hawaii (since 2010). It has been identified twice in Canada (2002 and 2006) but could not be proven to be established (SHB was probably not strong enough to overwinter in freezing conditions). SHB has also been discovered in Egypt, but recent surveys conclude that they were "not very well established". (Hassan & Neumann, 2008). The range of the SHB has not yet extended to Europe, except for one consignment of queen bees coming from Texas, intercepted and eradicated in Portugal in 2004.

SHB distribution in grey (as of 2010). Adapted from http://entnemdept.ufl.edu/creatures/misc/bees/small_hive_beetle.htm

SHB has been spread by a number of pathways: for short distance trips, SHB can fly up to five kilometres or eggs may be attached to the back of worker bees (Queensland Government Department of Agriculture, Fisheries and Forestry). Any kind of bee equipment or any bee-related material (supers, queens, clothing and gear, etc.) is also a potential vector of contamination. For longer distances, it could transit via international fruit imports (e.g., SHB may lay on avocado, banana, grapes, mango, melons etc.), movements on freight containers or vehicles themselves (e.g., adult SHB or pupae in soil attached to heavy machinery).

What can we do?

Border controls

Being an island nation is a great advantage for controlling all imports and therefore preventing the access of pests and diseases by:

- prohibition of importations of bees or equipment that could carry SHB
- pre-border inspections and fumigation of high-risk goods, such as fruit, before goods are sent to New Zealand from infested areas.

Surveillance programme detection

If SHB were to arrive, eradication won't be easy. The only chance for eradication subsequent to an incursion will be early detection and response. Even then, success is not guaranteed because of the biology of SHB.

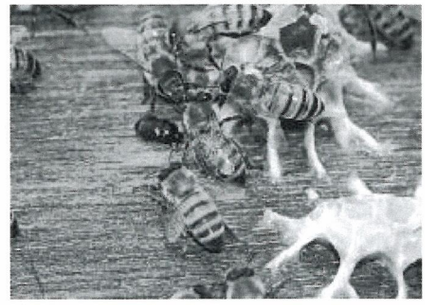
The surveillance programme has two components that need to work together to ensure that an early detection of pests and diseases is achieved in order to attempt eradication. These components are the active and the passive surveillance programmes.

The active surveillance programme is managed by AsureQuality on the behalf of the Ministry for Primary Industries (MPI) and is run once a year. It targets high-risk areas identified by assessing the likely point of entry to the country for the different exotic pests and diseases.

The second component of the surveillance programme is the passive surveillance programme that relies on every beekeeper throughout the country being educated to a point where they can detect pests and diseases while checking their own hives. This second component is the key to early detection of SHB rather than the active surveillance programme. Therefore, beekeepers have a responsibility to notify MPI when they see something unusual that could indicate an incursion of SHB.

If beekeepers suspect that their hives have small hive beetle, EFB or any other exotic pest or disease, they should report these findings immediately through to the 0800 80 99 66 MPI Hotline.

Beekeepers have to understand the life cycle of SHB and must remain vigilant when inspecting their beehives. Be aware that ***identifying the SHB is not an easy task: it moves fast and avoids light.*** Nevertheless, SHB may be seen on the top or bottom board, or running away as the beekeeper opens the hive. A simple test can be done to check your honey top supers: place it on the hive lid in a sunny spot for about 10 minutes. The bright light will drive the beetles down to the bottom. If present, adult beetles should be visible on the lid when the super is lifted.



Can you spot the beetle? Photo: The Food & Environment Research Agency (UK).

Identifying clinical signs of SHB infestations is also an efficient way to detect the pest. Tunnels inside the frames (dug by larvae), brood destruction (eaten by SHB larvae) and honey fermentation or change of colour (initiated by defecations and holes in the brood) are key indications and should be followed up by further investigation.

Two main differences exist between SHB and wax moth damage: SHB does not leave any webbing or particles of comb debris as found with wax moth infestation. Instead, infested combs have a 'slimy appearance'.

If beekeepers suspect that their hives have small hive beetle, EFB or any other exotic pests or disease they should report these findings immediately through to the **0800 80 99 66 MPI Hotline.** An AsureQuality Apiculture Officer will follow up on every report and may get suspect samples sent to a nominated MPI Laboratory for positive identification of the beetle.

SHB control

SHB is a very challenging pest. There is worldwide agreement that the bees themselves are the most efficient defence in preventing losses due to SHB infestation. A strong and healthy colony is able to contain an intrusion. This explains why African bees are not so seriously impacted by SHB. →

Summer, when conditions are favourable for SHB activity, is the more critical time of the year, and therefore demands greater attention.

In infested areas, beekeepers can reduce the impact of SHB by using good managerial practices, such as:

In the apiary

- Maintain strong, healthy colonies (young productive queen, unite weak colonies with stronger ones, boost weaker colonies with capped brood from strong colonies: make sure you are not spreading AFB though!
- Do not throw burr comb on the ground around the hives. It is better to collect all excess wax in a bucket and remove it from the yard
- Remove excess supers from the colony and keep a good bee/comb ratio, as frames with few or no adult bees make good hiding places for beetles
- Renew or fix your equipment so you minimise cracks and crevices in the hive
- Keep the bottom board clean and free from debris (favourable for SHB reproduction)
- Maintain good hygiene around the apiary (if possible, place hives on rock or hard clay-based soil rather than sandy soil)
- Do not mix infested supers with disease-free hives.

In the honey house

- Keep the honey house clean and tidy
- Extract honey within 2 or 3 days after harvest or store supers under refrigeration
- Ensure that brood is not brought back to the honey house
- Maintain humidity lower than 50% in the facilities
- Process wax cappings quickly.

Manage and fight SHB

Once a hive is infested, it is rather hard to get rid of SHB. All of the practical advice given above still applies. In addition, several techniques exist to fight SHB.

Ensure you are not spreading the disease around

Place a fluorescent light near the floor of the honey house to attract larvae falling out of infected supers as they look for a place to pupate. If larvae are found on the bottom board, do not brush them off onto the ground. Doing so will only lead to more adult beetles in a few weeks! Any larvae found should be removed from the colony and killed by either freezing them for 24 hours or placing them in a closed container with soapy water. Freezing supers for 24 hours at -12°C will kill all stages of SHB and storing all frames and supers in a cold room (<10°C) will eliminate the chance of re-infestation.

Tackling the infection

Several kinds of traps exist. They all operate with an attractant (often apple cider vinegar) and a killing agent (mineral oil), and use the size difference between SHB and bee for screening. The traps vary in killing rates but unfortunately provide only limited control for SHB. A survey conducted in the USA by the group Bee Informed showed no difference in colony losses during winter between beekeepers using traps and not using traps.

Very little progress has been made on chemical treatments since SHB appeared in the USA. Priority has been given to mechanical and biological solutions.

New research on SHB control

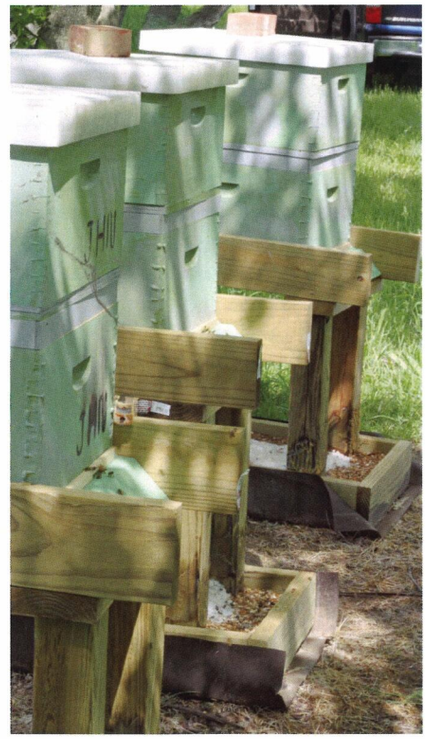
The United Kingdom National Bee Unit recently published an article (Cuthbertson, Mathers, Blackburn, & Marris, 2014) about SHB control using nematodes. *Steinernema kraussei* and *Steinernema carpocapsae* are two species of **soil-dwelling worms that have been demonstrated as an effective killer of pupating larvae.** Ongoing work will define quantities, time span and application process to ensure optimal results. Various positive experiences from beekeepers can be found on the Internet.

Dissected SHB larvae releasing the entomopathogenic nematode Steinernema carpocapsae. Photo: The Food & Environment Research Agency (UK).

Another idea is to use the yeast *(Kodamea ohmeri)* responsible for honey fermentation. It produces odours that attract adult beetles, which may lead to the design of an effective lure.

Some honey bees have been identified as perpetuating 'good hygienic behaviour', meaning they consistently detect and remove brood with SHB eggs. Breeding selection would boost bees' self-resistance.

The Sustainable Agriculture Research & Education Program (SARE) in the United States is funding research on the Salt Box, an integrated management approach for SHB. The idea is to forbid access to suitable soil for pupation (for further information, see http://mysare.sare.org/mySARE/ProjectReport.aspx?do=viewRept&pn=FNC10-843&y=2013&t=1). The first phase of testing has been successful.



The Salt Box. Source: http://mysare.sare.org/mySARE/ProjectReport.aspx?do=viewRept&pn=FNC10-843&y=2013&t=1

To sum up, it appears that an integrated pest management (IPM) approach is the most sensible strategy for the control of small hive beetle. For example, using hygienic queens, SHB traps and nematodes on the ground, as well as good beekeeping practices, could provide an efficient protection.

SHB, a real challenge to overcome

The New Zealand bee industry is currently free of SHB. Nevertheless, the industry needs to remain aware of the potential risk. By being consistent on inspection and reporting, maintaining rigorously high standards of hive hygiene and good practice on every level, and updating knowledge of the beetle and progress on treatments, the New Zealand industry can prepare to challenge SHB in the event of an incursion.

Acknowledgement

This article was funded by the Ministry for Primary Industries through the Honeybee Exotic Pest and Disease Surveillance Programme. [Refer to Taylor, B. (2011). Honey Bee Exotic Disease Surveillance Report. *Surveillance, 38*(3), 29–30, http://www.sciquest.org.nz/elibrary/edition/5539]

Resources and further reading

These can be found at: http://nba.org.nz/about-bees/pests-and-diseases along with the text of this article.

MPI

New mānuka honey labelling Guide out

By Scott Gallacher, Deputy Director General, Ministry for Primary Industries

The Ministry for Primary Industries (MPI) has outlined what claims can be made on honey labels and has taken the first steps towards defining mānuka honey.

In July, MPI released an Interim Labelling Guide for Mānuka Honey, which clarifies what is expected on honey labels and in advertising, including clarifying issues around therapeutic and health claims.

The process for developing the Guide began nearly a year ago with the release of an MPI discussion paper on mānuka honey labelling options. Since then there has been extensive work with scientists and industry representatives through a work group process, with more work planned over the next year.

"We recognize that creating a Guide will have an impact on businesses, therefore we have involved industry in the development of the Guide and are giving businesses a chance to ensure that their products are true to label."

MPI produced an initial draft Guide and tested this with the industry in late 2013. Following on from this we held an open industry meeting in February 2014, attended by over 80 people.

The working group began meeting in March and has been involved in reviewing each draft of the Guide until the interim Guide was finalised. It was important that the process was transparent therefore summary notes of the meetings have been published on the MPI website.

The work group encompassed a wide range of views from industry and independent scientists, mānuka honey producers and exporters.

The interim Guide identifies what constitutes mānuka-type honey. This is honey that contains a proportion of mānuka, but may be either multifloral with mānuka or monofloral. At this stage there is a lack of good, robust and validated scientific data to characterise monofloral mānuka honey, which is honey gathered predominately from the nectar of mānuka flowers.

MPI is funding further research to characterise monofloral mānuka honey, with the initial results looking promising. In addition, MPI also wants to work with industry on joint research initiatives. When this research is validated it will be incorporated into a revised Guide which MPI aims to consider in late July 2015."

The Guide also clarifies that the Australia New Zealand Food Standards Code prohibits therapeutic claims on food products. Statements such as 'non-peroxide activity' 'total activity' 'peroxide activity' 'activity' and variations on these terms are considered therapeutic claims because they imply that the honey has some sort of antibacterial effect when it is eaten.

For beekeepers and honey producers who want to know what this means for their products, a good place to start is with the MPI website: http://www.mpi.govt.nz/food/food-safety/mānuka-honey

If you have a question or would like more information, contact MPI on 0800 00 8833 or manuka.honey@mpi.govt.nz

September is Bee Aware Month!

By the NBA Management Team

The theme and key messages for Bee Aware Month 2014 focus around protecting and promoting bees.

We want everyone to Bee Aware and there will be messages around biosecurity and honey imports, and the need to donate to programmes designed to preserve New Zealand's bee populations. New Zealand Customs has come onboard for biosecurity reasons around honey imports and will add a post to its website about the importance of bees. Its website attracts around three million views per month.

School video competition

The school video competition is under way. We have already had several schools interested in producing video material that highlights the importance of bees and why we should be good to them. Catch them young and instil the message for a lifetime. Entries are due in at the end of August. The winner will be announced in September. Palmers Gardenworld will provide prizes of $500, $300 and $200 for 1st, 2nd and 3rd respectively. You can view 2013's winning videos on the NBA website.

Sponsors and partners

Sponsors this year include De Winkel, which has donated $20,000 to support BAM,

NBA member Kim Kneijber shows fascinated Stonefields School students a display hive during Bee Aware Month 2013.

Palmers and Excelso Roastery from Tauranga, all of whom are donating proceeds to BAM.

De Winkel is an avid supporter of Bee Aware Month and their yogurt even features a 'help the bees' design. You can check out the 'Bee Story' at www.dewinkel.co.nz

Palmers will feature in the September issue of *NZ Gardener* with its free lavender giveaway and colouring competition. A donation to NBA will be made with every 1.5L lavender plant sold in September.

Palmers' Facebook page will have a quiz app with the chance to win a trip to Great Barrier Island, including a tour of the manuka oil distillery. Bee Aware Month will feature in Palmers stores, website and catalogue during September.

Check out the Bee Friendly workshops in your local Palmers Store and www.palmers.co.nz for all their activities.

Excelso Coffee is giving Bee Aware Month a caffeine BUZZ! Excelso is a small boutique coffee roastery that has been roasting in the Bay of Plenty for 20 years. Excelso continuously supports the environment through its recycling campaign, so it was a natural step to support Bee Aware Month. For every black and yellow 'Keep Cup' (coffee travel mug) sold during Bee Aware Month, Excelso will donate $2 to the NBA. You also get a free coffee and 10% off every coffee when you bring your mug in! Watch the Excelso Facebook page for the buzz on their events during September.

Honeymeisters has exciting in-store Bee Aware Month activities and is donating $1 from every jar of Beeville Raw Honey sold during BAM to the NBA.

We are grateful for the huge amount of support this year including from Hubbards, Honey Wrap, Waitakere Ranges Regional Park, Wellington Botanical Garden, Jordan Shearer from Masterchef, Waitata Riverside Pohutukawa, Wild Forage, NZ Gardener and Otago Farmers Market. Entrepreneurial

A staff member from Palmers helps Stonefields School students plant their school garden. Photos property of the NBA.

students from Nelson College for Girls will also be supporting BAM with a percentage of profits being donated to the NBA from their emerging body butter product.

Facebook

The BAM Facebook page is up and running and will be buzzing with information and competitions in September. The NBA website will also feature BAM prominently. We have already reached thousands of viewers and are building up loyal fans. We would love it if you could like and share the Facebook page and increase the reach of BAM!

Community events

If you are planning any Bee Aware Month activities, including community and school visits, let the NBA Secretary know so we can support them with local media activity: secretary@nba.org.nz

Media

Bee Aware Month has been all over the media already and we can't wait to see the success of BAM this September.

Risks of adulterating mānuka honey

By Karyne Rogers, GNS Science and Merilyn Manley-Harris and Megan Grainger, Department of Chemistry, University of Waikato

Dr Karyne Rogers, GNS Science has teamed up with Associate Professor Merilyn Manley-Harris and PhD student Megan Grainger from the University of Waikato to explain the current state of play with adulteration detection and suggest some possibilities for further research in this area.

Introduction

The price of mānuka honey is indexed to its methylglyoxal content (MG) and trade continues to be extremely brisk this year, with mānuka honey containing MG 250mg/kg selling for up to $45/kg and more in some instances. Several research programmes are under way to cultivate mānuka plants capable of producing honey with high MG content, some of which have multi-million dollar investments, and plantations of such trees are becoming a reality. But what if generating a high MG honey was as simple as taking synthetic dihydroxyacetone (DHA, the kinetic precursor of MG) and adding it to low MG mānuka honey? Or, for that matter, kānuka or even clover honey? These questions are addressed below.

Synthetic MG versus natural MG – how can we tell?

It is possible to produce a high MG mānuka honey by adding synthetic methylglyoxal (MG) purchased from a chemical supplier; however, authentic high MG mānuka honey has a DHA and MG content in an approximately 2:1 ratio when the honey is matured. A simple chromatographic profile will detect direct MG addition, as it would not have the correct DHA:MG ratio. However, addition of synthetic DHA cannot be detected by this method as it behaves in exactly the same way as the naturally occurring DHA, converting to MG over time with a similar DHA:MG ratio upon maturation. An additional complication is that synthetic DHA, during the course of the reactions that give rise to MG, also changes some physical properties such as colour and viscosity that might be used for honey identification.

Can we differentiate between synthetic and natural DHA in honey?

In theory, it is possible to detect DHA artificially added to honey by analysing its carbon isotope signature, since many commercially available products are made from petroleum products which have more negative carbon (around -30‰), compared to plant products which, for mānuka honey, lies between -25 to -26.5‰. *[Editor's note: ‰ stands for per-mille or per-mil; i.e., parts per thousand.]*

Dihydroxyacetone is manufactured by the oxidation or fermentation of glycerol. Glycerol itself can be sourced either from the waste of biodiesel manufacture from fats and oils or synthetically from a petrochemical origin. DHA from these two sources would be expected to show different carbon isotope signatures.

Dr Karyne Rogers assessed the stable carbon isotope composition of a range of commercially available DHA products, which are used as standards in DHA and MG testing laboratories within New Zealand and China. Of the six synthetic DHA samples tested, only one synthetic sample was outside the naturally occurring honey isotope range (suggesting that this one was derived from petroleum products), while the other five synthetic products were isotopically indistinguishable from DHA found naturally in honey. This suggests that a methodology for detection of adulteration of the honey that involves the distinction, either chemically or isotopically, of naturally occurring DHA from that of DHA added deliberately would be unsuccessful.

However, it is still possible that an indirect chemical test could be developed since synthetically produced DHA may contain impurities resulting from manufacture which, if incorporated into honey, could be used to detect addition of this chemical.

Currently there are several research projects analysing honey samples from around New Zealand to characterise mānuka honey regions and their expected DHA and MG levels. They are documenting the ranges of plant DHA and honey DHA and MG contents, as well as looking at other microscopic, chemical and physical properties. Once these surveys are completed, deviations from expected values might be viewed with some suspicion by testing facilities and many buyers within the industry.

Is New Zealand mānuka honey under threat of adulteration?

There is always a significant risk in basing a pricing index or identification programme for mānuka honey around the presence of DHA and/or methylglyoxal alone, as it may encourage adulteration. However, risks for New Zealand are extremely low, given the technology available to detect adulteration and the ongoing research around characterising mānuka honey. Although DHA and MG markers are critical for trading high-value mānuka honey, other more stable marker compounds and organoleptic, microscopic and physiochemical parameters are likely to be included for future mānuka honey authentication criteria. By using a combination of analytical parameters, unusual levels of DHA and/or MG will be evident when compared to normal background compounds. The biggest adulteration risks lie in overseas markets where there could be imitation of New Zealand's mānuka honey by adulteration of other honey varieties with synthetic DHA or MG.

What still needs to be done?

- Completion and publication of comprehensive surveys of the range

Continued on page 15

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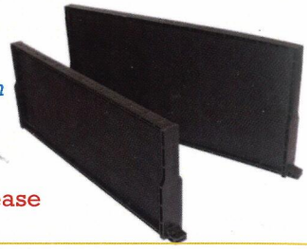

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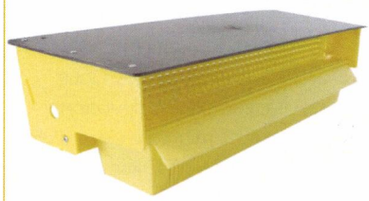

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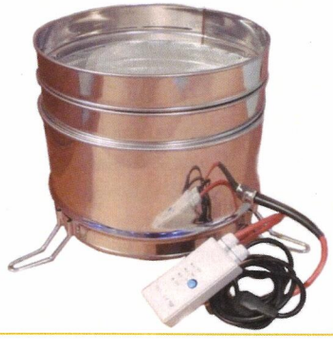

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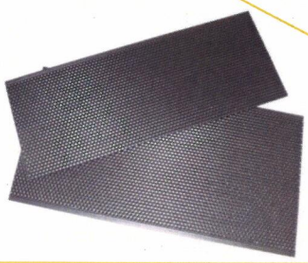

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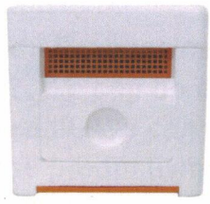

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Continued from page 13

of DHA and MGO contents that can be expected from New Zealand mānuka honeys and DHA content of nectars of *Leptospermum scoparium* from different regions.

- Completion and publication of comprehensive surveys of the range of physical properties expected from mānuka honeys originating from New Zealand.
- Evaluation of the effect of the addition of synthetic DHA upon physical and chemical properties of mānuka honeys.
- Chemical investigation of the range of synthetic DHA products to attempt to identify potential marker compounds if these are used as adulterants.

As far as the authors are aware, some of this work is currently under way but not all.

Need a power boost?

If you are feeling you need a pick-me-up over the winter months, this is fast and fabulous at any time of the day!

Ginger, Lemon and Honey Power Boost Drink

1 lemon
1 or 2 slices fresh root ginger
1–2 teaspoons mānuka honey (or any other raw honey of your choice)
Hot water

Cut one nice slice of lemon. Juice the rest. Put into heatproof cup or glass with root ginger, honey and hot water. Decorate with lemon slice.

Chef's note: Other spices like star anise, whole cloves or a cinnamon stick all blend well with lemon and honey, or mix it up with a slice of lime. During the summer months, these combinations are equally as good with ice and mineral water (either still or sparkling).

- Maureen Conquer, Wild Forage Ltd

New Zealand Apiculture Industry Conference, Wanganui, 2014

NZ APICULTURE INDUSTRY CONFERENCE 2014

Photo: Frank Lindsay.

Adapting a smoker

By Martin Garside, Auckland Beekeepers' Club

One of the most frustrating items in the beekeeper's arsenal of tools is the smoker. It is one item that has not changed since the dawn of modern beekeeping and is not only difficult to light but also difficult to keep alight, especially when working alone, which is most of the time.

There is a new breed of smoker coming onto to the market with either a small battery-powered fan blower in the handle to eliminate the bellows, or a battery-powered heater element and fan built into the handle, which eliminates both lighting and blowing of the smoker. Both are good but expensive and not readily available in New Zealand.

Note the hole and the 'flap door' cover.

To overcome the problem, Paul Brown came up with a brilliant idea that I would like to pass onto our members.

First, drill a small (10mm) hole in the firebox just above the level of the internal grate. I found that the best place was on the right-hand side so that, when holding the smoker in your left hand to operate the bellows, the hole would be in a convenient position for applying the flame with the right hand.

Fashion a small flap door out of thin flat aluminium or steel (a beer can is good, after drinking the contents, of course) and attach over the hole with a small self-tapping screw. You should be able to move the flap from side to side, to have the hole either open or closed.

Load your smoker with your fuel of preference: you can even put a little green grass on top to keep the smoke coming out of the smoker cool. Then, using a small butane lighter (such as a cigarette lighter on a high flame or a small blowtorch available from Mitre 10 or Bunnings: a crème brûlée burner works well), light the material through the bottom hole. With a few puffs of the bellows you will have a good smoke going and ready to start work.

The advantages of this system are:

1. easy to load the fuel into the smoker. Just push it in until it is full. Place green grass on top.
2. lighting from the bottom gives cool smoke through all the material and green grass.
3. no flames or sparks coming out of the smoker, as only the top material is on fire.
4. no burnt bees or scorched wax.
5. easy to relight, if it goes out, by opening the fire hole flap and applying the blowtorch.

I have found that this makes lighting the smoker, and keeping it alight, easy peasy.

Enjoy!

Lighting the smoker. Photos: Carol Downer.

[Editor's note: this article originally appeared in the August 2014 edition of the Auckland Beekeepers' Club newsletter with the title 'Smoker adaption'. We have made minor modifications. Thanks to Carol Downer for passing on the article and photos.]

Correction to National Honey Show 2014 results

The August 2014 journal contained an error in the results for Class 3: Liquid Honey—dark. Jeff Robinson was awarded second place, in this category, not Arataki Honey Rotorua.

We apologise for the error.

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- Withdrawal period for honey: 0 days
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- Strips can be used in a hive for up to 8 weeks
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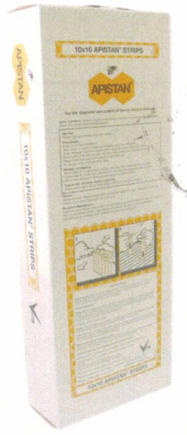

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Report on Rome meeting

By Maureen Conquer, President, Apimondia Oceania Commission

My last trip to Apimondia headquarters in Rome in May was again a whirlwind of meetings and mind-numbing facts, figures, challenges, and networking, along with some solutions.

Apimondia executive at FAO headquarters. From left: Jodie Goldsworthy (Australia), Jose Gomercindo Correa da Cunha (Brazil), Prof Cleofas Cervancia (Philippines), Philip McCabe (Ireland), Prof Jacobus Biesmeijer (Netherlands), President Gilles Ratia (France), Riccardo Jannoni-Sebastianini (Italy), Dr Wolfgang Ritter (Germany), Etienne Bruneau (Belgium), Maureen Conquer (New Zealand), Prof Woo Kunsuk (Korea), Vice President Lucas Martinez (Argentina). Absent: Dr Nicola Bradbear (UK), Prof Karl Crailsheim (Austria), Dr Theodore Cherbuliez (USA), Mulufird Ashagrie (Africa).

On the first day we met at 7.15 am in preparation for a full day at the FAO (Food and Agriculture Organisation of the United Nations). The FAO is a huge city within a city, which seems only second to the Vatican in size and protocol. The security measures alone to get in the door were somewhat overwhelming.

We spent the day talking to various departments about collaboration under their new strategic objectives for how Apimondia's commissions, scientific or regional, can work to assist in the global battle against hunger, malnutrition and rural poverty. Discussions ranging from Codex to rural poverty and famine in war-struck zones were carefully choreographed, as only international politics can do. Networks and connections were made at diplomatic level, which hopefully will be mutually beneficial.

Left to right: Maureen Conquer with Maria Lucia Piana and Gian Luigi Marcazzan, studying honey sensory analysis and the Italian teaching programme, San Pietro Terme, Italy. Photos supplied by Maureen Conquer.

I presented a proposal from our Pacific neighbours, prepared in collaboration with Richard Duncan from the Niue Honey Company, for an excellent sustainable project, which I must say seemed to fall on polite ears. Oceania is indeed a paradise in comparison with so many other regions in our world.

The next two days were filled from 8.30 am to late after dinner with matters mainly of symposia and congresses past, present and future, and the issues of finance and structures needed to support beekeepers, researchers, scientists and commercial partners to educate, grow and improve our bees and industry.

There were presentations and debriefs from the Kiev congress in 2013 and planning sessions with the Korean and Turkish delegations, who will be hosting the main Apimondia congresses in 2015 and 2017, respectively. The congresses are amazing events attended by around 10,000 participants to share and learn what they can about bees, honey and the global red tape that binds them. It's an experience I can recommend for all serious New Zealand beekeepers. Put Daejeon, Korea, in your diaries now for September 2015. Then dream about Istanbul in 2017! Both are large and proud honey-producing nations.

At the conclusion of our Rome meetings, I travelled north to a picturesque town called San Pietro Terme, near Bologna, to attend a four-day crash course of study on honey sensory analysis with Dr Maria Lucia Piana, a world-acknowledged expert honey consultant and judge. I was joined by Gian Luigi Marcazzan, an Italian government honey researcher and honey sensory analyst from the CRA-Honeybee and silkworm Research Unit (CRA-API). It was enlightening to closely evaluate the very thorough and developed European system for quality control, marketing and judging. They have generously shared their knowledge and training programs with me, which I hope we can study and use to improve what we are doing in New Zealand.

I look forward to developing new evaluation systems along with our new standards to help New Zealand honey producers to maximise their products and profits. I await with interest the findings from the BPSC and look forward to a more defined and creditable future for our industry.

FROM THE COLONIES

Waikato Branch

The kakabeak is starting to flower so that is a sure sign that there will be no more holidays! The tui are back and the bees are out in the garden today. I have started my first round of checking: I have missed those wee furry things (weird, yes!). The queens are starting to lay, and most boxes still have plenty of tucker and look relatively mite 'free'. The weather has been warm and on some days hot—shorts weather even—so I am a little worried about the dreaded drought word.

- Barbara Cahalane

Poverty Bay Branch

Early August inspections have indicated that hives have wintered very well with few losses. Doubles are still very heavy and have a good population of bees. I am not sure where they will put the willow unless they get through a few more stores before late August.

Trees for Bees

Replanting is continuing 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.

- Paul Badger, Branch President

Hawke's Bay Branch

Sad news from Hawke's Bay this month with the death of a local beekeeper. Hugh Ashcroft was part of one of our earliest beekeeping families. His dad was the late Bill Ashcroft, Mayor of Havelock North and their brand was Rakanui Honey. Hugh was honest, hardworking and a good beekeeper.

Hugh died on 16 July in Europe. He was 65 years old and had almost completed a 'dream holiday' three-month cycling tour.

His life was celebrated at a service in Hastings on 8 August with family and friends including his two brothers, three sons and three grandchildren.

- Pam Flack

Nelson Branch

As I check a few crops, many buds are swelling and some early bloom is out on some plants. The season is upon us, with bees definitely starting to get going, which appears to be earlier than last year. Several beekeepers have been feeding and have seen very little brood break over the mild winter.

Varroa numbers are unfortunately high in some hives also. The need at those sites for early placement of mite strips is definitely required to minimise any injury damage to the building bee workforce.

I need to get out and check a few more hives and start those spring activities. Where did the winter go?

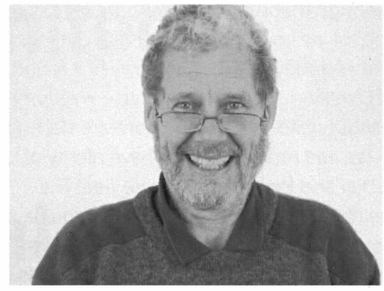
- Jason Smith

PHOTOS FROM CONFERENCE

Above: Linda Bray received the Buzziest Bee Award. It was presented by Rose Davey of Comag Industries to the person who has worked for the industry without recognition or fanfare.
Bottom right: Some of the elders. Left to right: Pat & Terry Gavin, Pat & Ian Berry & Bob Blair.
Top right: Overseas speaker Prof Rob Currie, University of Manitoba. Prof Currie spoke at the industry workshops and at the science seminars, including providing advice on how to improve our queen bees.
Photos: Frank Lindsay.

It's time to inspect your hives

By Frank Lindsay, NBA Life Member



September is another of those crucial months in beekeeping. Queens are coming into their peak laying period.

Italian queens will lay in all the spare cells that are covered and heated by the bee cluster, whereas Carniolan queens will lay right to the perimeter of the area covered by the bees.

If the weather is good, with no very cold spells, all the larvae will be fed and the hive will expand enormously.

Pollen and nectar sources

The ability for the bees to expand in numbers is attributable to an oversupply of nutrition: good pollen with a protein content above 20% with all the essential amino acids. Commercial beekeepers have long known the value of willows in the spring. Bees get a boost from the pollen, and sometimes can put on a super of nectar that sets up the hives for the next month.

It doesn't take a great number of trees to supply a hive's nutritional requirements. Just one tree can support five to 10 colonies. The late Merv Farrington kept bees on State Highway 56 just out of Palmerston North for years. This is open dairy country, with perhaps 10 houses and gardens within a half mile. He found that one mature willow made a huge difference to the development of his hives in spring.

It's important to know when various pollen and nectar sources will come into flower. Dr Linda Newstrom-Lloyd's research with willows should have some direct benefits to beekeepers. Pussy willow generally is the first to flower, and has male and female trees. Males supply pollen while the female supplies pollen and nectar. It's best to have one of each within 100 metres of the apiary if you can. Following on the pussy willow, a number of other willows flower: these are the ones that provide most of the spring nectar as well as pollen.

A lot of the really good spring sources come from trees on the regional councils' noxious plant (pest plant) lists. I can understand why cracked willow is on these lists as it blocks waterways, but it's also beneficial in that it helps clean the water by taking nutrients from it. Many willows don't block waterways but as council staff or contractors usually don't distinguish between good and bad willows, they will cut the lot.

Another very good source is hawthorn. If you live in an area first populated by English or Irish immigrant farmers, you could have hawthorn hedges. This tree provides both pollen and nectar but is disliked by apple and pear growers as it can carry fireblight. I was impressed by the number of neatly trimmed hawthorn hedges in Tasmania. Their farmers haven't forgotten the benefits of providing shelterbelts for stock, and beekeepers also benefit.

> "You do not want to have a break in brood rearing during the spring build-up..."

Commercial beekeepers cannot always place apiaries near good sources of pollen; however, commercial supplements are available that come without the threat of spreading disease as can happen when storing pollen frames.

For the hobbyist in an urban area, numerous spring flowers and ornamental trees produce heaps of pollen. *Ceanothus* is an excellent source of pollen and has a very showy blue flower. You tend to see more of these in the cooler areas, especially in the South Island, where they provide the first real source of pollen.

Adequate nutrition allows the bees to produce drones and when the hive gets really populated and restricted for space, the bees will produce queen cells in preparation of swarming. We need abundant pollen, which results in plenty of early mature drones to produce queens to fill splits and to requeen hives that have older failing queens.

Queen cells

Producing queens is an art but bees do it naturally, so we use these instincts to produce our queen cells. The most important ingredient in producing queens is to have lots of nurse bees with pollen in their ventriculus (midgut) so they produce highly nutritious royal jelly from their hypopharyngeal glands.

If there isn't a lot of pollen coming in when you want to produce queens, scrape down a pollen frame to the midrib. Mix it with the honey stored around the pollen to make a sticky goo so that the bees consume it immediately. You now have all the nurse bees with lots of royal jelly ready to feed developing queen cells.

Generally bees produce queen cells to replace an aging queen. Through overcrowding, the nurse bees may not be getting enough pheromone to suppress their ovary development, or they may not be picking up the pheromone from the queen's feet as she moves through the hive. Either factor will stimulate the development of queen cells.

Tips for the first inspection

As beekeepers we want our bees to continue to build to a large population capable of bringing in lots of nectar without swarming.

For those newer to beekeeping, there is a thrill to see your bees flying in the spring. Select a day when the bees are flying and it's not too cold on your arms with your sleeves rolled up (i.e., 16–18°C). Commercial beekeepers will work hives at lower

temperatures, as they are quicker and more experienced.

Take time to observe what's happening at the entrance of the hives, as this gives you an indication of what's going on in the hive. Bees should be guarding at the entrance on a warm day, checking all the flying bees coming into the hives. A good proportion should have pollen on their back legs. This can indicate you have brood in the hive.

There will also be the odd 20–30 dead bees in front of the hive: bees die every day. What we should be looking for are young shrivelled larvae or small bees without wings—a sign that varroa levels are high in the hive.

Check that the front of the hive is clear of grass so the bees have unobstructed comings and goings and that there's good air space around the hive. You can then proceed to inspect the hives, but make sure the zip on your hood is completely done up. Bees defending their hives seem to find an unzipped zipper fairly quickly.

Light the smoker and make sure you have a good volume of smoke and that it keeps going. I tend to use dry pine needles I've stored over the winter. Puff three or four puffs into the entrance and wait a couple of minutes and repeat. This gives the bees time to adjust to the smoke, as well as disguising any alarm pheromone given off by the guard bees.

Then gently remove the roof and place it within easy reach upside down beside the hive. You are going to put the supers you remove on the upturned roof so that no bees are squashed.

Using your hive tool, lift up the hive mat slightly and waft a little smoke under the cover and over the top of the frames. You now have the hive under control and are ready to inspect the hive.

We have several things to do during our first inspection. First, look under the crown board and on to the frames below for moisture. Some moisture around the edges is OK but the hive mat shouldn't be completely wet. Frames shouldn't be damp or mouldy: if they are, you need more top ventilation. Placing a small twig under each corner when you close the hive will reduce the moisture build-up.

Second, we must establish that the hive is disease free. This requires an inspection of all frames starting at the bottom super. Beekeepers without a DECA (those who haven't sat and passed the AFB recognition test and specified what you will do when finding disease) will have to get an approved beekeeper to do this for them. Waft some smoke over the top bar again and gently prise apart the supers. Place the top one on the upturned roof so you are looking into the bottom super.

Remove the outside frames and then proceed to check all frames for the old sealed cells or old larvae left in the cells. Flick the capping off any isolated sealed cell and check what's underneath. It could be scale from AFB, dried-up sacbrood or chalkbrood or nearly fully developed bees killed by varroa.

You can have AFB scale in the bottom of a hive but it may not be showing in the larvae in the top super at this point, as the bees might have moved from the diseased area on to disease-free comb. Just one AFB cell condemns the hive to the fire, but make sure it is AFB before following that procedure. If you are not sure, contact another beekeeper or send in three sample larvae to AsureQuality for a laboratory diagnosis.

While the hive is disassembled, check the quality of the hive stand. Wooden pallets tend to rot and although they may look OK now, they might not be able to take the weight of a four- to six-super hive full of honey. Also check the woodware: will it do for another year? The odd crack can be sealed with foam plastic or left as is if you want to collect propolis. Frames with broken lugs or old brood frames you can't see the sun through should be replaced. Any frames with brood should be moved to the outside of the brood nest so they can be removed after the brood has emerged.

Next, reassemble the hive but reverse the top and bottom supers so the bulk of the bees and brood are on the base, with honey and pollen frames and some empty frames in the middle of the super above. Bees move up in the hive as they develop and by reversing the brood nest, we eliminate one of the conditions that triggers swarming; i.e., congestion.

Next, check the food supply. All hives must maintain a minimum of three frames of honey in the hive at all times. This is the amount a growing colony can use in a week of inclement weather. If your hive is getting close to this amount, consider feeding sugar syrup. You do not want to have a break in brood rearing (when bees run out of food, they will cannibalise the brood for food) during the spring build-up, which results in fewer bees at the honey flow.

If you still have lots of sealed honey over the brood nest and not many frames of open drawn comb for expansion, add another super, putting honey and pollen in the second super with drawn comb in the middle, as mentioned above. Don't wait for the bees to completely fill the second super with bees before adding another. Once the second super has about six frames covered with bees, add another. The queen will be laying about 1000 eggs a day, which means another frame will be covered with bees every two days.

For those using a queen excluder above the bottom super (i.e., you have a single-super brood nest), move a couple of frames of emerging brood (after shaking off all the bees to make sure the queen is not moved up) into the second super to prevent crowding. The nurse bees will quickly move up and cover the brood frames again so they shouldn't get chilled.

Preventing swarming

Usually after a few years' experience you can recognise those hives that build and produce drones early. These are the ones likely to swarm and can be dealt with early to prevent it. One way is to give them more room, perhaps swapping them with a weaker hive so the field population is moved to the weaker hive. Another way is to transfer emerging brood frames to the weaker hive but before doing this, it's important to establish why the other hive is weaker. Check for disease.

You might find the odd hive with only a few bees perhaps covering two frames but with no brood (indicating it's queenless) or perhaps spotty brood with raised cappings, indicating the hive has a drone-laying queen or has laying workers. In this situation, usually the drone-laying queen is removed and the whole hive is put on a good strong hive. Small hives are not worth all the work of building up again. It's far easier to combine weak hives and then make splits/nuc hives further into the season to make up for your losses. And there will be losses: as the saying goes, where there is livestock, there is dead stock. It's something we have to get used to but we all try to prevent this from happening by wintering strong hives with plenty of stores and a young queen.

Continued on page 25

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Some hives will be small in size, perhaps because they robbed other hive(s) during winter and brought back a load of varroa mites. Generally these have spotty brood and aren't capable of growing quickly. You can give them a shake of nurse bees off an open brood frame from a strong hive, but first make sure the queen is not on the frame you intend to shake into the weak hive. Marking queens by putting a tiny touch of a marker on the thorax of your queens makes it easier to find them and also gives you an indication of the queen's age. If there's no marked spot, it indicates she's a supersedure queen.

Supersedure queens made late in the season might not have had the full nutrition required or may be poorly mated, so should be marked for replacement. Queens produced during the early autumn while nectar is still coming in are generally OK. Generally we judge whether a queen is any good or not by the brood pattern. If you see more than 15 cells missed per 100 cells, she should be replaced.

Things to do this month

Do an AFB check. If you find any, separate off the stored supers that came from that particular hive and destroy them. If you can't identify the individual supers but know which supers came from that apiary, put an apiary quarantine on that particular apiary for 18 months using those supers only in that apiary.

Feed hives if necessary: hives should have a minimum of three frames of honey in them at all times.

Spray or weed whack the vegetation surrounding hives.

Check stored supers for wax moth. Cull old frames from the brood nest or work them gradually to the outside if they contain brood so they are replaced within a month.

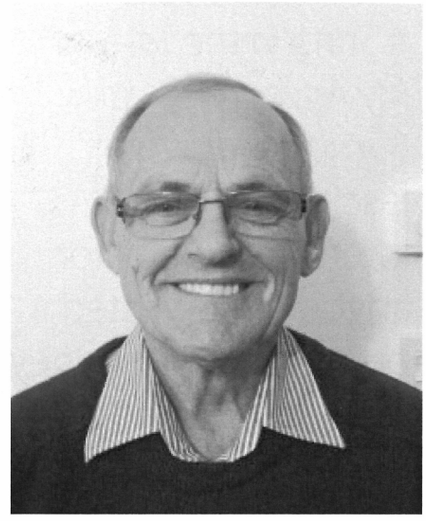
Get the wax dipper going to dip new and reconditioned supers so that replacement hive parts are ready for another season.

Put in early mite treatments or check mite levels using a cappings fork, sugar shake or a strip in a jar for 30 minutes or natural fall over a week with mesh bottom boards. Check your varroa manual to calculate mite numbers and treatment options. Don't forget to rotate treatments to prevent resistance developing.

An interview with Peter Ferris

Peter (PJ) Ferris is the new Southern North Island Ward representative on the Executive Council.

The Publications Committee interviewed him about his role and experience in the industry.



How long have you been a beekeeper?

When I began dating my wife, her stepfather was a commercial beekeeper, so if I wanted to spend time with her I had to get involved in beekeeping.

Tell us about your current business.

Presently I am doing apicultural consulting, which provides auditing and inspecting hives for non hands-on hive owners, who currently have their hives managed for them. I am involved with AP2 inspections for the NBA AFB Pest Management Agency; plus Judi and I have also recently commenced conducting the Level Two apiculture course in various parts of the country.

What do you enjoy most about beekeeping?

I love the whole aspect of beekeeping, from being out on a glorious day listening to the birds while I work the hives to the sense of achievement gained, while processing the crop, when the honey is being decanted into drums.

I especially enjoy watching nuclei grow from a few frames to being a robust, thriving hive.

Why did you decide to become an Executive Council member?

Having spent the last 40-plus years in the beekeeping industry, I feel that now that I am free to do so, it is my turn to give back to the industry that has been my family's livelihood.

Now that I no longer have ties to any of the commercial beekeeping companies, I am now able to be impartial in regard to decisions for the wellbeing of the beekeeping industry as a whole.

Tell us a bit about your role on the Executive Council, including your priorities as an Executive Council member.

As Southern North Island Ward representative I have been appointed to the Bee Products Standards Council. As the ward representative, I will ensure all concerns and any issues that have been brought to my attention from NBA members who have contacted me will be raised at the appropriate time during both council and executive board meetings.

What key issues and challenges do you see the beekeeping industry facing?

Unity in the industry is the key issue at present. Plus establishing a body that will represent all aspects and sectors of the beekeeping industry.

What will you do about those issues and challenges, during your time on the Executive Council?

I will endeavour to help find solutions for issues that are raised during my term in office.

When you're not at work or attending a Council meeting, where will we find you?

Spending time with my family. I have four terrific grandchildren, two boys in the Wairarapa and two gorgeous girls close by in Hawke's Bay.

A Sting in the Tale, by Dave Goulson

By Frank Lindsay, NBA Life Member

A Sting in the Tale: My Adventures with Bumblebees is a fascinating and interesting book for anybody interested in bumblebees or honey bees. It provides a bit of a sting in the tale for us here in New Zealand too.

Dave Goulson was a Professor of Biological Science at the University of Sussex and is now at the Sterling University in Scotland, studying and directing graduates into further studies. He also founded the Bumblebee Conservation Trust (BBCT).

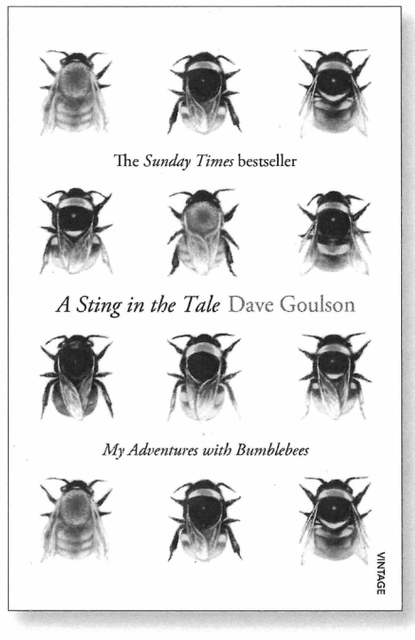
Dave's prologue describes his early years living in Shropshire. He kept the usual pets then ventured into collecting more exotic things, storing them in boxes in his room. Doesn't every little boy collect roadkill to dissect? His fascination started with bumblebees when he tried to warm up some chilled bees.

This book is 256 pages long and is written in an easy-to-read style full of interesting information, with a full index at the back. The 17 chapters follow his university career and his different research projects. These include trips to Tasmania to assess the impact the introduction of bumblebees has made since their accidental/deliberate release. Dave Goulson has also visited New Zealand a number of times to look at the distribution of the introduced bumblebees and what they are feeding upon so he could mimic their food requirements ready for their re-introduction back into Britain. He includes a lovely, brief description of each of his co-workers, making them people not just names.

He touches on the bumblebee pollination industry that operates in Europe, which distributes bumblebees into Europe and Asia, and the dangers they can pose to native bumblebees. Did you know that you can use nurse honey bees to support a queen bumblebee in establishing a nest? And that over 500 tonnes of bee-collected pollen is used to produce over a million nests per year under factory farming techniques for glasshouse pollination?

> **"Bumblebees are in decline everywhere, mostly due to a loss of habitat caused by intensive farming."**

Bumblebees are in decline everywhere, mostly due to a loss of habitat caused by intensive farming. They have to feed every 40 minutes; otherwise they die. As Dave Goulson is based in Britain, he mentions a lot of the English plants that bumblebees visit. I needed to use my Reader's Digest *Field Guide to the Wild Flowers of Britain* to understand what he was referring to and surprise, surprise, most of these flowers can be found in New Zealand's pastures and gardens. They probably came with the English grass seed brought in by the early farmers to establish pastures here.



The same is true for the bumblebee species named in the book. Although there is a complete list of the different species of British bumblebees in the appendix, I had to refer to the Internet to identify our New Zealand bumblebees and their distribution.

This book gave me a greater understanding of the requirements of bumblebees. We need to have something flowering all year round to support their nests. To date, I have been planting dahlias and deadheading them so they produce a continuous flowering through the summer. Now I'll be planting a lot of different clovers for them and my bees. Did you know it is now possible to identify how many bees have visited a flower?

I highly recommend this book to any beekeeper or anybody who is interested in finding out something about those fluffy bumbling bees.

A Sting in the Tale: My Adventures with Bumblebees is published by Vintage Books (ISBN 978-009957-512-2). It is available in paperback ($27.99 RRP), hardcover ($44.99 RRP) or e-book (check retailer price) from bookstores or from Random House New Zealand http://www.randomhouse.co.nz/books/dave-goulson/a-sting-in-the-tale-9780099575122.aspx

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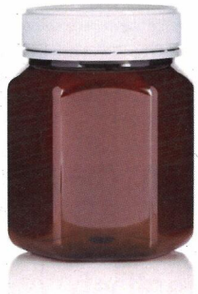
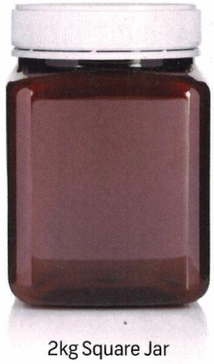


1kg Hex Jar

500gm Hex Jar

250gm Hex Jar



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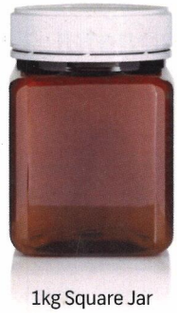

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