JULY 2016 | VOLUME 24 No. 6

The NEW ZEALAND BeeKeeper

Looking back, and forward

Bruce Wills

Honey industry goes to Parliament

Apiculture NZ Board elected

Cape honey bees: reproductive anarchy

Marco Gonzalez

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TABLE OF **CONTENTS**

Front cover: A full frame from a top-bar hive in the Waikato. Check top-bar colonies every three weeks make sure the cluster is against a bar of honey. Bees don't naturally move sideways in cold weather. Photo: J.F.C. van Velsen.

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OUTGOING CHAIRMAN'S REPORT

LOOKING BACK, AND FORWARD

Bruce Wills, outgoing independent chairman, interim Joint Executive Council

Although the journey to unification was not always an easy one, the Joint Executive Council (JEC), comprising members from both the National Beekeepers Association (NBA) and Federated Farmers Bees (FF Bees), has made great progress for the New Zealand apiculture industry.

I feel privileged to have played a small part in this journey as independent chairman of the Joint Executive Council.

The goal for the JEC was to create a peak industry body to represent the entire bee sector and that is what we have achieved.

The apiculture industry was unique in the primary sector in having two industry bodies representing only parts of it.

Feelings among the industry and most members of both organisations was that it made sense to have a unified, pan-sector organisation.

A modernised and updated Constitution and rules was put to NBA members, with 58% voting in favour of change. This led to the formation of ApiNZ.

The first step in this process was my appointment as independent chair in July 2015 and getting the Joint Executive Councils in a room to work out how we moved forward together.

Concurrently, the Apiculture Interim Governance Board (AIGB) worked on the updated constitution and rules for the new unified industry body. The JEC and AIGB worked closely and on April 1, 2016 Apiculture NZ came into being.

Looking back to our first JEC meeting held in Christchurch in August 2015, there was a degree of tension and suspicion between some members of both the NBA and FF Bees.

Change is not always easy and there was understandably loyal support for both organisations; however, we worked through these tensions and got there in the end. I commend both parties for putting aside their differences and understanding each other's points of view for the greater good of the industry.

The JEC met formally five times to progress industry unification. My role was to ensure that the views of both NBA and FF Bees were heard, and that we continued moving forward—in a fair and transparent way—to achieve the industry unification that members had been calling for.

We made steady progress and I am confident in the decisions that were reached.

As we finished our final formal JEC meeting in May 2016 (before the AGM in Rotorua and the handover to the new elected Apiculture NZ Board), it was hugely pleasing to see a far more cohesive and happy group of beekeepers and industry representatives. Gone were the prejudices and politics of old. The new mood is one of working together for the good of ApiNZ and the wider bee industry.

The honey industry is booming and the success of apiculture remains critical to the success of New Zealand's primary industries. I am excited ApiNZ is now up and running: a peak body representing all sector participants and stakeholders. The future for the New Zealand bee industry is bright.

[Editor's note: Bruce Wills will be the Acting Chair of the Apiculture New Zealand Board until a new Chair is appointed.]

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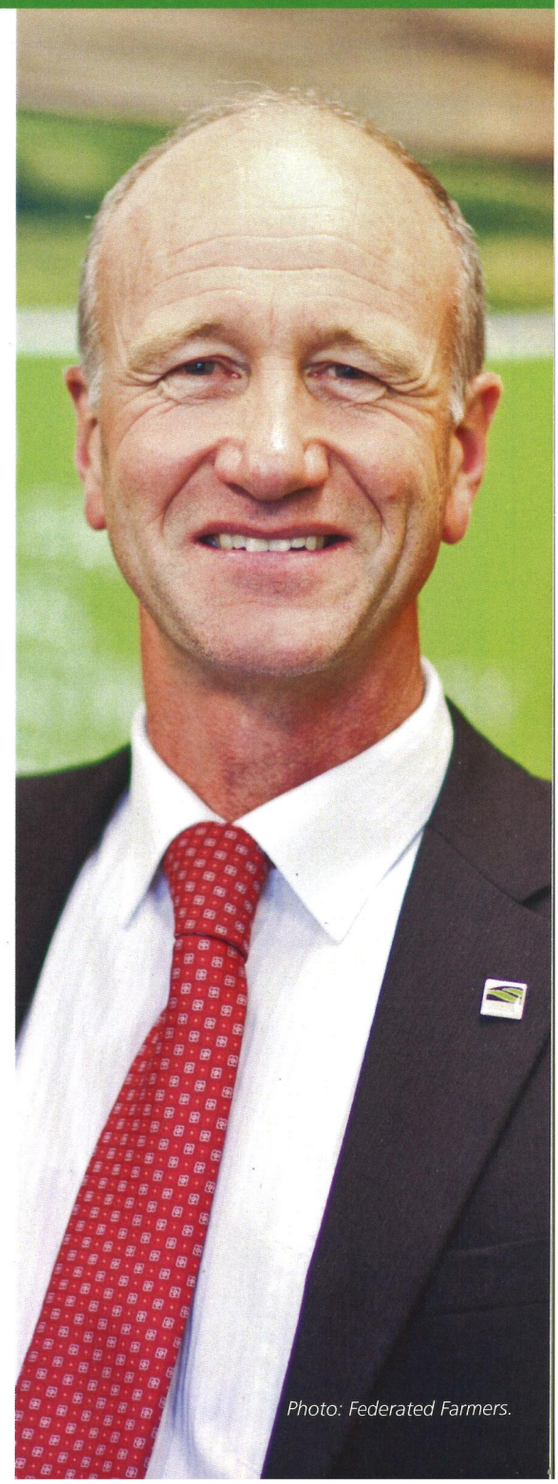

Photo: Federated Farmers.


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OUT AND ABOUT

THE HONEY INDUSTRY GOES TO PARLIAMENT

Apiculture New Zealand Management Team

One of the real problems for the apiculture industry in the past has been its fractured nature and lack of contacts between groups. This caused many to draw back into tribal groups of hobbyists, beekeepers, commercial processors, exporters, and landowners rather than working as a united team. That real problem of traction and oneness was the major reason why it has been difficult to drive the Industry ahead.

The breakthrough came when the industry decided to put aside all the petty squabbles of the past and move jointly into the modern age to form Apiculture NZ. Elections have now been held for the new Apiculture NZ Board. The newly elected Board members held their first meeting on 22 June at the New Zealand Apiculture Conference. Read more about the new Board on page 9.

However, time and tide waits for no one and the business of the industry has to be progressed. A united group from a full range of honey interests, including representatives from Apiculture NZ, were pleased to accept an invitation from Hon Steven Joyce, Hon Nathan Guy and Hon Jo Goodhew to meet at the Beehive on 25 May to begin the process of looking at what can be done to promote research and development within the Industry.

The outcome of the meeting was very positive. It was acknowledged that no decisions could be made before the new Board is appointed, and that careful thought needs to go into how research directions and funding could be structured.

However, these decisions, long term, can affect the future of every person in the apiculture industry.

There are many areas where work can be progressed; for example, the further development of the many different types of honey, dealing with pests and diseases, biosecurity, testing standards, traceability, and many other issues that need to be fully tackled with well-funded research.

The Primary Growth Partnership (PGP) on high-performance mānuka plantations has only two years to run. The science capability and research links developed here could be moved under the control of Apiculture NZ. This project was financed by 50% Government assistance and has developed a lot of public good research, which could be shared with the Industry.

The Mānuka Research Partnership Ltd (MRPL) runs the PGP. The MRPL is chaired by Neil Walker, who also chairs the AIGB that progressed the merger. Speaking after the Beehive invitation, Neil Walker said, "The PGP had shown how competing groups can work together on a problem. We hope to bring that cooperative spirit into Apiculture NZ in order for all Industry sections to work in harmony."

ApiNZ CEO Daniel Paul said, "Now that the Government and MPI can talk to an organisation that represents all sectors of the Industry and we can have a coordinated approach, we are likely to make far greater progress with finding solutions."

Apiculture NZ also held a function at Parliament to talk about the new united industry and also about the current state of the export market in mānuka honey from Comvita's perspective.

The function was attended by 17 MPs from all the major party groupings (National, Labour, Greens and New Zealand First). Members were very enthusiastic to see the progress being made, with some MPs saying it was a good news story they should have heard about before.

THE APICULTURE INDUSTRY ON THE NATIONAL STAGE

Photos: Apiculture New Zealand.

pī-ā-ora BEES GIVING LIFE APICULTURE NEW ZEALAND

APICULTURE NZ BOARD ELECTED

Apiculture New Zealand Management Team

We are pleased to announce the results of the Apiculture New Zealand Board election.

Voting to elect nine representatives for the inaugural Apiculture New Zealand Board of Directors closed on Wednesday, June 8.

The successful candidates and members of the new Board are:

Non-commercial sector: Paul Martin

Commercial sector: Dennis Crowley, Barry Foster, Ricki Leahy, Russell Marsh

Market sector: Stuart Fraser, Sean Goodwin, John Hartnell, Peter Luxton

Congratulations to all those involved. Profiles for each of the Board members are available on the ApiNZ website.

We see this as an exciting milestone. It's the first step in ensuring ApiNZ is well placed to deliver a successful and professional service to members in keeping with our Constitution and Strategic Intent.

We would also like to thank those candidates who were unsuccessful on this occasion. The fact we had such a talented pool of people putting up their hands for a Board role bodes well for the future and we hope you and others like you will contest future elections.

We look forward to the future of Apiculture New Zealand under the direction of this new Board.

CONFERENCE

Conference is done and dusted for another year. It was a huge affair with over 1400 registrations. We hope you all learned a lot and enjoyed catching up with colleagues.

Congratulations to the organising committee for their hard work, and thanks to all who attended.

We will be publishing several articles about conference in the August journal.

WHAT IS THE MEANING OF THE WORDS?

D. N. MacLeod, Technical Focus Group Member

The Apiculture New Zealand Technical Focus Group (ApiNZ TFG) recently made a submission on the DuPont NZ Ltd. application APP202774 (Apiculture New Zealand, 2016). DuPont NZ Ltd is seeking approval from the EPA for the aerial application of the insecticide Exirel® on fodder brassicas.

Flowering brassicas are an excellent source of pollen and nectar for foraging bees. The ApiNZ TFG acknowledges that New Zealand bees are used to pollinate forage brassica crops, where they are grown for seed production. This includes specialty brassica crops and canola/rapeseed crops. The insecticide Exirel® was initially approved on 28 June 2013 by the EPA decision HSR100857. This stipulated that the following Section 77A controls must be applied to the label.

SECTION 77A CONTROLS–HSR100857

According to the EPA decision HSR100857, "The following must be stated on the label:

i. Use of Exirel® must be by ground-based methods.

ii. Spray Exirel® in flowering crops only after honeybee flights, unless spraying after daily honeybee flights is not possible.

iii. Ensure flowering weeds are removed before spraying Exirel® to avoid potential exposure of honeybees."

The NBA Technical Committee did not make a submission at that time on this product, because its use was for forage brassicas only.

Our concern now is that the applicant expects that these controls will still be in place for the aerial application approval, so are the controls practical for aerial application?

Our concern now is that the applicant expects that these controls will still be in place for the aerial application approval, so are the controls practical for aerial application?

There is no argument with respect to the toxicity of Exirel® to bees if they are oversprayed. The ApiNZ TFG does not disagree with the intent to aerial spray the product, if it is done safely. Aerial operations with

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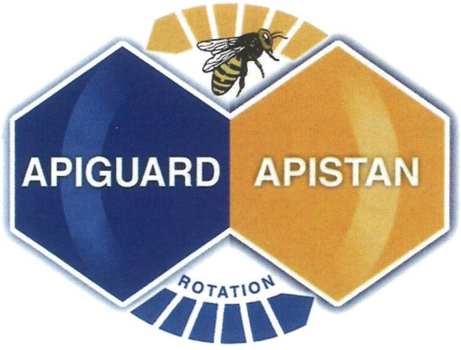

When to use Apistan and Apiguard?

Apistan can be used at any time of year, with best results when applied during a build up of brood prior to the honey flow, or after the honey flow.

Apiguard is best used when the weather is warm and consistently over 15ºC so not early in the spring. Place the trays or spread some gel on the cards provided and place on the top of the brood box frames as per the instructions on the packet, with room for the bees to get at the material. The concentrated natural ingredient encourages the bees to try and move the product out of the hive. This distributes the vapours of the thymol based **Apiguard** throughout the hive killing up to 97% of varroa mites.

In ten to fourteen days, check the hive and add another tray or more gel. This will complete the treatment. If you want to be sure to cover two full worker brood cycles, treat again in fourteen days. Use the full recommended dosage each time. Don't skimp - your bees and hives and honey crop are too valuable to try and save a dollar or two on an incorrect treatment.

A good rotation plan is to use **Apistan** in the autumn or early spring and **Apiguard** in the late spring/early summer just prior to the honey flow, or immediately after you take off the honey. This keeps the bees busy removing the gel and will minimise robbing behaviour

Safety?

When used according to the instructions, **Apistan** is unlikely to leave any residues in the honey. (If someone says otherwise they are either fools or deliberately trying to mislead you.) **Apistan** in the measured dosage strips and inserted into the hive as per the instructions is harmless to humans and honeybees.

Apiguard, being a natural product derived from thyme is non-toxic to humans and does not affect honey or wax. It is approved in Europe as a varroa treatment for hives in organic honey production.

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AFB can be eliminated from NZ if it is identified and those infected hives are burnt. But you don't want to burn false positives.

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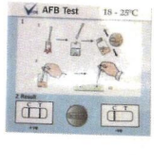

**Please note the AFB test kit is a single use kit*

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pesticides can be conducted safely by well informed and trained operators. Our concern is in fact not with the owner of Exirel®, DuPont NZ Limited, but with the EPA and the current practices to ensure that Section 77A controls are correctly worded to ensure clear, informative labelling. This has to ensure Good Agricultural Practice (GAP) is followed.

Our major concern is that Section 77A Controls–HSR100857 ii and iii are not effective. Control ii is ambiguous and leaves open operator options that are harmful to bees. The ApiNZ TFG agrees with the first part–"Spray Exirel® in flowering crops only after honeybee flights,"–as this is good agricultural practice. However, Control ii is poorly worded: we believe it should read "Spray Exirel® in flowering crops only after honey bee flights have ceased".

But the second part of this control–"unless spraying after daily honeybee flights is not possible."–opens up a lot of options. This is a dangerous precedent, again poorly worded and potentially promotes bad practice. For example, if aerial spraying is not possible in the evening when planned, is the alternative to spray at midday the next day?

Control iii is flawed and is unacceptable, as it gives approval to spray flowering crops, but not to spray flowering weeds. Most beekeepers know bees are attracted to flowering brassicas, yet nowhere in the EPA Controls or in the present label for Exirel® (ACVM Registration P8752) does it mention that the crop should not be sprayed when and if in flower. Does the EPA or the applicant hold data to show that flowering fodder brassicas are less attractive to bees than flowering weeds?

With respect to all New Zealand farmers who grow forage brassicas, how many regularly walk their paddock and remove all flowering weeds? How many farmers think to themselves, "I am aerial or ground spraying 12 hectares. When should I remove all flowering weeds? The month, the week before or the day before?" Yeah, right!

Many forage brassicas are grown within paddocks containing pasture legumes, which are often in flower at the same time as the spray operation is taking place. In addition, many hill country farmers crop only the most accessible parts of a paddock in brassicas, leaving steeper country in pasture including legumes, and weeds to flower in the uncultivated parts next to the brassica crop. The avoidance of overspraying by helicopter in both of these cases is impractical.

The ApiNZ TFG recommends that the EPA change the existing controls and for aerial application to read as follows:

1. do not apply Exirel® to flowering crops or plants within the crop. This is global best practice to prevent harm to foraging bees

2. apply a Section 49 control from the Hazardous Substances (Classes 6, 8, and 9 Controls) Regulations 2001. This is a default control for all Class 9.4 substances.

The other issue with application APP202744 is that there is no mention of surfactant use, but the DuPont label for ground spray use (Exirel® P8752) specifies it must be used with a surfactant at maximum rates. Both the first application and this application never mention the use of surfactants. This is misleading as the effects of surfactants are not considered by the EPA evaluation. The ApiNZ TFG submission points out that surfactants can enhance the toxicity and ecotoxicity of pesticides when used (Mesnage et al., 2014; Mullin et al., 2015).

The ApiNZ TFG is still awaiting a decision on when the EPA will reassess the use of surfactants and spray tank adjuvants when used in a wide dispersive manner in the environment.

Note: Exirel® is a registered trademark of the DuPont Company and its affiliates.

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PRODUCT ANALYSIS

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Nitrogen 50.35	Phosphorus 10.07	Potassium 2134.84
Sulphur 271.89	Calcium 90.63	Magnesium 211.47
Sodium 1701.83	Iron 0.703	Copper 0.064
Manganese 0.041	Iodine 454.50	Molybdenum 0.01
Selenium 0.01	Zinc 0.360	Boron 6.060
Cobalt 0.010		

Vitamins Vitamin A, Vitamin C, Vitamin E, Vitamins B1, B2, B3, B5, B12, Fucoxanthin, Choline, Folic Acid

Amino Acid (mg/100gm)

Aspartic Acid 7.17	Threonine 1.72	Serine 1.91
Glutamic Acid 19.19	Prolin 0.90	Glycine 2.62
Alanine 8.64	Valine 1.90	Isoleucine 0.87
Leucine 1.71	Tyrosine 1.41	Phenylalanine 1.31
Lysine 1.85	Histidine 0.68	
Arginine 1.50	Cystine 2.05	
Methionine 0.47	Tryptophan 0.21	

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Stu Ferguson

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CROP RECOMMENDATIONS ON PESTICIDE LABELS

In New Zealand there are no required specific descriptions for crops for label use for pesticides. There are no common shared definitions between EPA (approving pesticides for use and release in the environment) or MPI (registering pesticides under the ACVM Act 1996). MPI does refer to a 1994 Codex guideline but admits it is out of date.

Two terms are used on all neonicotinoid seed treatment labels that the ApiNZ TFG recommends should be improved—these are the crop descriptions Forage Brassicas and Grass Seed.

A forage brassica is a crop of the dicotyledon plant genus Brassicaceae that is grown for the sole purpose of providing fodder for livestock. Comparing same product labels between New Zealand and Australia, I note that the Australian Pesticides and Veterinary Medicines Authority (APVMA) wants crops specified in a clear manner. The APVMA labelling requirements specifies all forage brassicas by species—kale, turnip, swedes, etc. The MPI requirements for labelling only state forage brassicas: see table comparison below.

In New Zealand, seed treatments state 'grass seed' but there is no mention of clover seed, despite the fact that clover seed is often coated and is regularly mixed with grass seed where it is in contact with insecticide-coated grass seed. In Australia, all products identical to the New Zealand seed treatment chemical specify all pasture species where the product can be coated.

I have heard beekeeper comments (not yet substantiated) that farmers are growing insecticide-coated brassica and insecticide-coated canola for seed.

To my knowledge there is no neonicotinoid insecticide approved for use on a canola crop when grown for seed in New Zealand. This spring, if you know that these crops are being coated with systemic insecticides, please let us know where, who is supplying it and help us verify the use of insecticides.

Both EPA and MPI are adopting GAP (Good Agricultural Practice) and that should include best practice labelling. The ApiNZ TFG would like to work with these agencies to improve and adopt a clear description for each and every crop for all pesticide labels.

	LABEL – CROP APPROVAL DESCRIPTIONS AS PER PRESENT LABELS	
Product and Registration Number Active Ingredient	**New Zealand**	**Australia**
Gaucho ACVM P004200 600 g/l imidacloprid	Forage Brassica Grass Seed	
Gaucho APVMA 46227/58490 600 g/l imidacloprid		Forage Brassicas (kale, turnips, rape, and swedes) Forage and Seed Pasture (e.g., grasses such as ryegrass, fescue and phalaris; clovers such as subterranean, white, red, strawberry; medics; lucerne) Canola *(listed separately)*

VELVETLEAF INCURSION

You are probably aware of the importation of the velvetleaf weed in coated fodder beet seed. We do not know what this fodder beet has been coated with, particularly if an insecticide is used. Coated seed with insecticides is not treated by the EPA as a hazardous substance: it is considered as an 'article', so is not subject to the Hazardous Substances and New Organisms (HSNO) Act 1996.

There is no requirement for insecticide-coated seed to comply with the Agricultural Compounds and Veterinary Medicines (ACVM) Act 1997. We do not know if there is a financial advantage for the importer to coat the product overseas. Clearly, seeds coated overseas can cover up weed seed in the shipment.

To date, New Zealand has not had any reported bee kills due to the handling and sowing of neonicotinoid insecticide-coated seed, as has happened in Europe and North America. This, we believe, is due to the skills of the few companies in New Zealand who provide this service and ensure the integrity of the seed coating applied.

The velvetleaf incursion through imported coated seed means that supervised controls of seed coating practices that apply in New Zealand are not ensured by the exporter or importer to New Zealand. If weed seed can get in, can we be assured that we will not have a problem with insecticide dust at the sowing of that seed, which has proven to be a hazard for bees internationally?

As of 16 June 2016 we have not been advised by the importer, MPI or EPA about the nature of the coating on the imported fodder beet seed. Does anyone know if this coated fodder beet contained an insecticide?

References for page 11

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PEST AND DISEASE CONTROL

CAPE BEES: REPRODUCTIVE ANARCHY IN THE HIVE AND A RECIPE FOR DISASTER!

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A key to the success of honey bee colonies is the coordinated effort of every member of the colony to fulfil their own duties for the wellbeing of the colony. It is the job of the queen bee to ensure that every member of the colony contributes selflessly to the success of the colony.

The queen bee controls the entire colony's behaviour and physiology with a number of different chemicals she produces, known collectively as pheromones. Workers have special receptors and have different responses to different levels of these pheromones. Examples of workers' response to queen pheromone include:

- when another queen bee is introduced to a queenright colony, usually workers won't accept her as they are loyal to their own queen.
- when a frame with eggs from another queen is introduced into a queenright colony, workers may remove and destroy these eggs because they can identify them as not being from their own queen. This response of worker bees is known as policing, and is discussed in more detail later in this article.
- when the amount of pheromones drops below a certain level, worker bees will attempt to raise a new queen to replace the current queen (supersedure).
- when a colony suddenly loses a queen, the workers will make an effort to replace her as soon as possible. If this attempt fails and there are no young larvae left to raise a replacement queen, the colony will become queenless. The lack of queen pheromone will stop preventing worker ovaries from developing and some workers will become drone layers. At this stage the colony is sentenced to die, but raising drones is actually the ultimate attempt by the colony to pass forward the colony's genetic material.

When *Apis mellifera capensis* bees (Cape honey bees) invade honey bee colonies of other honey bee subspecies, there is a disruption of the pheromone levels within the colony. The invading Cape honey bees, instead of carrying out normal workers' duties, can turn into pseudo-queens that behave as 'social parasites' by creating reproductive anarchy within the colony. This ultimately destroys the colony within a year of the initial invasion. Some people refer to this social parasitism as something similar to cancer cells growing and consuming all the beehive's supplies from within.

Cape honey bees, instead of carrying out normal workers' duties, can turn into pseudo-queens that behave as 'social parasites'

In order to understand why and how social parasitism is caused by Cape honey bees, it is important to learn about these fascinating honey bees.

Characteristics of the *Apis mellifera capensis*

The Cape honey bee is native to the Fynbos region of South Africa. This region is one of the most diverse ecosystems in the planet, with a high level of plant species that are unique to this small area of the world. In this region, Cape honey bees evolved in isolation from other bee species for thousands of years and became specialist foragers highly adapted to the Fynbos region. They perform poorly outside their native range compared to other bee subspecies.

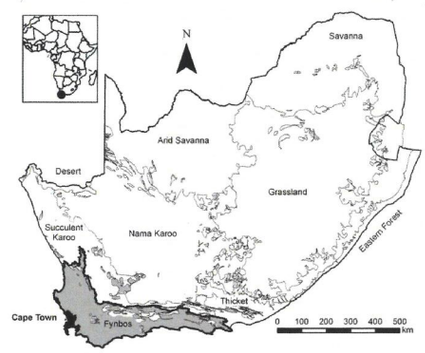

Figure 1. The Fynbos region (in grey), in the Cape region of South Africa, is a unique ecosystem. This region is the native range of the Cape honey bee. Source: www.ecologyandsociety.org, 2016.

Within this region the Cape honey bee is the honey bee subspecies used for beekeeping, including honey production and pollination services.

Beekeepers in South Africa found out in the 1980s that moving Cape honey bees outside their original range causes major problems to beekeepers who keep colonies of *Apis mellifera scutellata* (African honey bees). This problem is known as 'the Capensis problem' and was created by Cape honey bees invading colonies populated by *A. m. scutellata* and acting as social parasites in these colonies.

General description

The Cape honey bee is slightly smaller than the European honey bee. Its abdomen typically is completely black or black with grey stripes. The Cape honey bee has a better temperament than *A. m. scutellata.*

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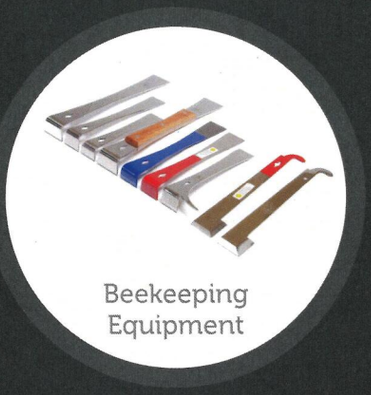

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Figure 2. Cape honey bee queen with **Braula** *on thorax surrounded by Cape honey bee workers. Source: AsureQuality Limited.*

Cape honey bees evolved in a very windy and exposed environment, so are used to flying fast and very close to the ground.

Similar to other honey bee subspecies from the African continent, these bees are prone to swarming and will abscond to escape disease and parasites.

Unique features of Cape honey bees

Following are some of the number of biological features of this bee subspecies that makes them unique.

High levels of queen pheromone

The queen Cape honey bee produces much higher levels of pheromones than queens from other *Apis mellifera* subspecies. As a result, the pheromone receptors of Cape honey bee workers will only respond to this high level of queen pheromone. This means that if Cape worker bees enter a bee colony with a queen bee from a different honey bee subspecies, they won't perceive the pheromone levels produced by the queen bee in the host colony. Consequently, some worker Cape honey bees will turn into a special type of laying worker. These bees will start producing queen-like pheromones to levels higher than those produced by the queen bee of the host colony, and for this reason they are often called 'pseudo-queens'.

Laying workers can lay diploid eggs[1]

A queenless European honey bee colony will eventually turn into a drone layer colony, when some workers start laying haploid eggs.[2]

In contrast, a queenless Cape honey bee colony is capable of having laying workers that produce both diploid and haploid eggs. This means that laying workers can maintain all castes of bees in the colony even when a queen has died. This includes raising a new queen from eggs laid by laying workers that were raised from eggs laid by worker bees. This can occur for several generations.

Suppression of worker bee policing

In a queenright colony, eggs laid by laying workers will be actively removed by workers. This activity of worker bees in queenright colonies is known as 'policing'. In contrast, when laying Cape honey bee workers are present in a bee colony of a different honey bee subspecies, host workers stop policing.

Some chemical signal is produced in the eggs and larvae of Cape honey bees that prevents the worker bees from the host colony from destroying and removing them. Furthermore, larvae from Cape honey bees appear to be actually more desirable to feed and raise than larvae laid by the host queen. Research has shown that Cape honey bee larvae, when presented to nursing bees of other subspecies, are fed up to 100% more than the larvae of the host subspecies. Also, it was shown that Cape honey bee workers provide less feed to larvae raised from eggs laid by queens from other honey bee subspecies.

Figure 3. **Capensis** *bees parasitising an African bee colony. Note two bees (Q) with pointy and shiny abdomen compared to normal worker bees. These are likely to be pseudo-queens. Photo: AsureQuality Limited.*

[1] Diploid eggs: eggs containing two complete sets of chromosomes, one from each parent.
[2] Haploid eggs: eggs having a single set of unpaired chromosomes.

The problem caused by mixing *capensis* bees with European bees

When a *capensis* worker bee enters a colony populated by another sub species of honey bee, the Cape honey bee workers quickly develop their reproductive organs, start producing queen-like pheromones and lay eggs that are semi-clones of themselves. The more Cape honey bee workers that enter the colonies, the larger the number of Cape honey bees that could turn into layer workers that behave as pseudo-queens.

Each pseudo-queen will lay eggs that are clones of themselves. These bees will start policing eggs and larvae from both the host queen and also from other Cape pseudo-queens. As a result, a strong competition begins inside the beehive, not only between the pseudo-queens and the host's queen, but also between the different pseudo-queens.

Inside the colony, the entire colony division of labour becomes disrupted by this fight for reproductive supremacy. Each of the pseudo-queens and their cloned daughters tries to build their own empire at the expense of the limited resources of the colony and without contributing to the survival of the colony. More and more workers keep engaged in attending to the pseudo-queen and are not foraging or defending the colony.

At this stage of the infestation, it is possible to see several pseudo-queens and their clones taking controls of different frames of brood until the pseudo-queen and her clones with the highest production of pheromone take total control of the colony. The host queen always dies soon after the pseudo-queen(s) start laying eggs, probably because workers stop attending to her due to higher pheromone levels produced by the pseudo-queens. From then on, only pseudo-queens lay eggs.

Cape honey bee pseudo-queens will never match the egg-laying output of a true queen bee. Therefore, the colony population is condemned to dwindle and eventually succumbs because of the lack of resources and diminishing population to the point of no return.

Pseudo-queen daughters also turn into more pseudo-queens instead of assuming foraging duties.

Well before the colony collapses, some pseudo-queens leave the colony inside small swarms, and others will leave the hive to invade another hive nearby to replicate this social parasitism.

Figure 4. **Capensis** *bees running off frame in invaded African bee colony. Source: AsureQuality Limited.*

Cape pseudo-queens invading other honey bee subspecies colonies in South Africa raise only more pseudo-queens, but not new queen bees. This clearly contrasts with the behaviour of laying workers inside a Cape honey bee colony.

A Cape honey bee pseudo-queen cannot fly large distances because of the weight of its reproductive organs. Thus, in nature the social parasitism spreads quickly only within apiaries or between apiaries that are less than 500 metres apart. Beekeepers with their hive manipulations have been the main dispersers of this pest through extensive areas in South Africa. Cape honey bees can move in the back of a beekeeping truck, inside parasitised hives that are moved as part of migratory beekeeping operations, or with swarms that are collected by beekeepers and hived near other bee colonies.

Diagnosis

Once the parasitism is well-established, signs of Cape honey bee parasitism include multiple eggs in cells with the presence of very dark relatively small bees and the absence of a queen bee.

Morphogenetics can be used for diagnosing Cape honey bees, but it is time consuming and not always definitive.

Currently the best method to confirm the presence of a capensis laying worker in a colony of European honey bees is by making the colony queenless and then checking if the colony is raising worker bees without the presence of a queen bee.

Does the Cape honey bee pose a biosecurity threat to New Zealand?

If a colony of Cape honey bees reaches our borders, it has the potential to exact a terrible cost to the beekeeping industry including the loss of export markets for live bees.

Beekeeping in New Zealand is migratory in most parts of the country, and there are areas that hold a large number of hives in close proximity for certain periods of the year (pollination, honeydew sites, honey flow sites, wintering sites). Therefore, Cape honey bees could spread throughout large areas of New Zealand within a short period of time.

The only treatment against parasitism from Cape honey bees is killing all the bees in the affected apiary sites. It would pose an enormous cost to beekeepers to depopulate and repopulate beekeeping gear, as well as the extra precautions they would need to take in order to prevent unexpectedly spreading this pest throughout their beekeeping operations.

Therefore, the most important message for beekeepers is to be on the lookout for:

- any signs of small dark bees in their hives
- signs suggesting that the hive is not queenright, such as frames showing multiple eggs in cells

- colonies that are getting weaker and weaker without any other apparent reason.

How you can help

If you see anything suspicious, please contact the Ministry for Primary Industries (MPI) using their MPI Hotline (0800 809 966), or contact your local Apicultural Officer at AsureQuality. They can arrange for the suspect apiary to be inspected, sampled and tested. It is always better to be safe than sorry.

Acknowledgement

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Further reading and resources

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PEST AND DISEASE CONTROL

EXCITING FINDINGS FROM WASP BIOCONTROL PROJECT

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The past few weeks have brought much excitement to the project, following a new finding about the mite *Pneumolaelaps niutirani.*

Nest excavation video garners global response

First, if you haven't seen it yet, do check the nest excavation video that went viral! Bob is in the lead role, in a bee suit. He is also the cameraman, the scriptwriter, the editor and the producer. What an amazing reaction this one generated—Bob made it to global media, including Discovery Channel, Canada who sent a crew to film Bob at work. It's not yet known when the Discovery Channel item will be aired.

[Editor's note: you can see Bob's nest excavation video at https://www.youtube.com/watch?v=4NxOYkw2z54. Ronny commented that "it is ten and a half minutes of nerve-wracking watch", and I must concur. Bob and the other members of the project team are heroes in the advancement of science!]

Together with the Discovery Channel crew, Bob was able to film the mites close up, which led to his discovery of the way the mites interact with the wasps. The first thing to understand in this context is how wasp nests operate like an organism, and how the different casts in the colony function like different organs. The workers are the long arms, venturing out to bring prey, but are unable to digest that prey. The larvae that occupy the cells in the comb are the colony's stomach: they get fed prey by the workers, digest it, use some for their own growth, and regurgitate the reminder to feed the workers. It turns out that the mites feed on this regurgitated protein, robbing it from the workers.

Results of mite gut analysis

Remember the mite gut analysis we told you about in update No. 4? (Groenteman, 2015). The results came back with no wasp DNA, and in fact with only mite DNA. Now we understand why: the mites feed on food that is well-digested, and any bit of DNA in it is completely broken down by the enzymes in the guts of the wasp larvae. That's one riddle solved.

Knowledge we have gained to date

- The mite *Pneumolaelaps niutirani* was first discovered in New Zealand in 2011 and named in 2016. It is not clear where the mite originates from. (Description and naming of the mite was done outside this project, in parallel.)
- The mite is widespread throughout New Zealand and was detected in hibernating wasp queens collected by members of the public from Northland to Southland.
- The mite is found in wild nests of both *Vespula* species present in New Zealand—the common wasp *V. vulgaris* and the German wasp *V. germanica.*

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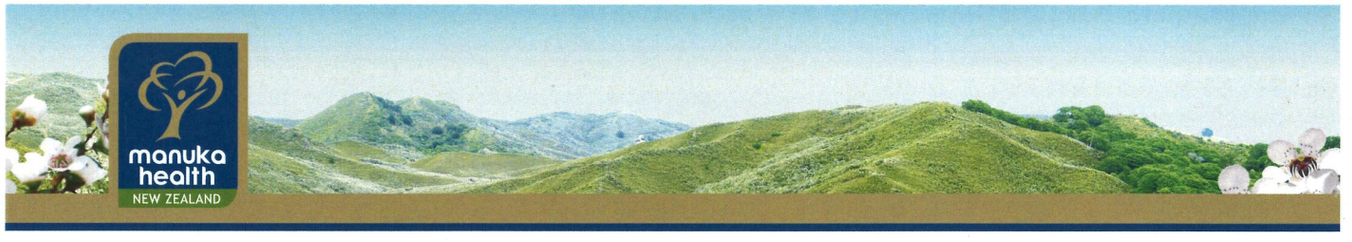

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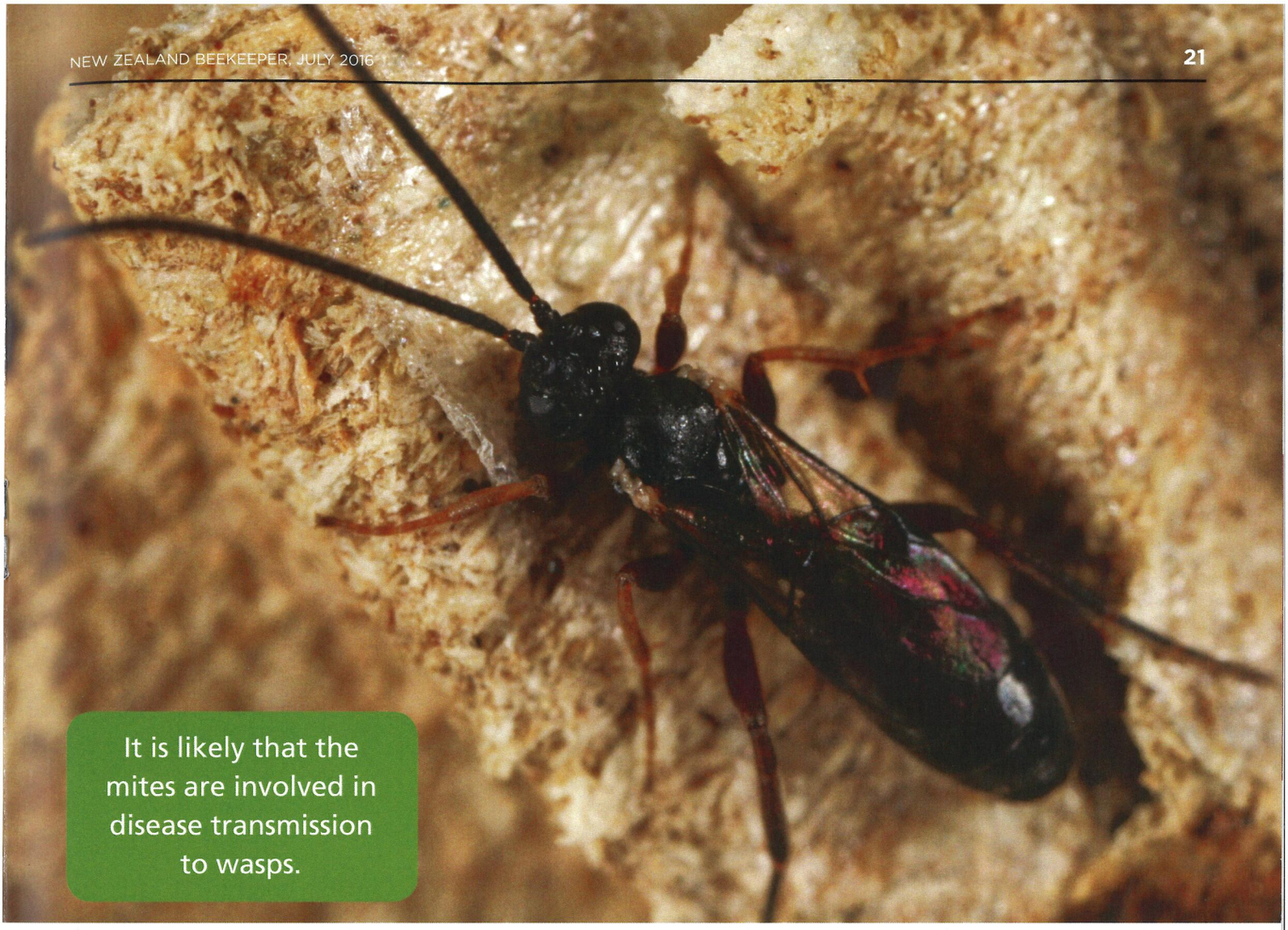

It is likely that the mites are involved in disease transmission to wasps.

Adult Sphecophaga. *Photo: Bob Brown.*

- Mites aggregate in large numbers on wasp queens before they leave the nest to hibernate. This tells us something about the mite's mechanism to disperse into new wasp nests. It also hints to us that the mites have probably evolved in close relationships to the wasps to be able to evade the wasps' meticulous hygienic behaviour, as well as to know when to jump on a queen for a winter shelter and a ride.
- Mite-infested wasp nests are smaller: half or even third the size of uninfested nests.
- Worker wasps in mite-infested nests appear less aggressive than workers in uninfested nests. This observation is anecdotal, and yet to be quantified.

Where to from here?

We suspect that robbing workers from food is not enough to cause wasp nests to be smaller and workers less aggressive. It is likely that the mites are involved in disease transmission to wasps. This means that in order to test the safety of the mite to honeybees and bumble bees, we would need a complex setup (including molecular testing) that goes beyond our means in the current project. This also means that the mite may be more reasonable to develop as a medium-scale medium-term biocontrol agent; i.e., one that would take some repeated efforts in augmentation.

In addition, work to underpin some of the basic science questions about the mite's abilities to evade nest hygiene and about its ability to vector diseases to wasps is now incorporated into the Biological Heritage National Science Challenges. *[Read more at http://www.biologicalheritage.nz/programmes/risks-and-threats/wasp-control]*

In our project though, we want to make more progress towards a long-term, landscape-scale biocontrol.

In our recent committee meeting, we have decided to refocus the project to look for wasp natural enemies that could do that.

We are now working with MPI's Sustainable Farming Fund to re-define the project for its remaining year-and-a-bit. While we will continue to do a small amount of work on the mite, we will now turn our main efforts to bringing new genetic stock of the *parasitoid Sphecophaga* to New Zealand. More on that in the next update.

We will now turn our main efforts to bringing new genetic stock of the *parasitoid Sphecophaga* to New Zealand.

Source

Wasp biocontrol update No. 6, e-mailed June 26, 2016.

Reference

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OUT AND ABOUT

FEEDBACK FROM THE NSWAA ANNUAL CONFERENCE

Frank Lindsay, Life Member

This year's New South Wales Apiarists' Association (NSWAA) conference was held just across the border from Victoria in Albury (Albury–Wodonga), a large progressive town on the Hume Highway. As it was autumn, the town reflected the colours from English and golden elms, silky oaks, plane trees, the box elder, the nettle tree, English and gall oaks, white cedar, the peppercorn tree, white poplar, the express tree, English hawthorn and the claret and desert ash. The first English elm was planted in 1868 and by 1909, 25 miles of streets had been planted (Gear, 2013). What surprised me, as a New Zealander, was the age and size of the brick commercial buildings, some dating back to the 1850s.

Being close to the Victorian border, there was a good turnout (approximately 170) of NSW and Victorian commercial beekeepers. The conference featured a number of extremely interesting presentations, some of which I have summarised below.

Diseases and treatment

On the regulatory front, beekeepers who find AFB must report it within 24 hours. NSW has 18 inspectors, but it's still a shared responsibility between the state's Department of Primary Industries (DPI) regulatory staff and beekeepers. DPI staff undertake a complete inspection of an area, looking for abandoned, unregistered and AFB hives. Their new boss wants better compliance and is happy to impose fines on those not complying with their regulations.

Doug Somerville gave a rundown of the department's activities over the past 12 months. Doug takes training courses in association with DPI's Tocal Agricultural College. These have been very popular, reflecting the growing interest in beekeeping. His report touched on nosema, a nutritional stress disease. He talked about nutrition and using open feeding of pollen supplement, something foreign to New Zealand beekeepers.

Dr John Roberts then talked about *Nosema ceranae* in greater detail. Because it isn't seen (nosema is a fungal spore that eats out the bee's stomach lining, with no really visible

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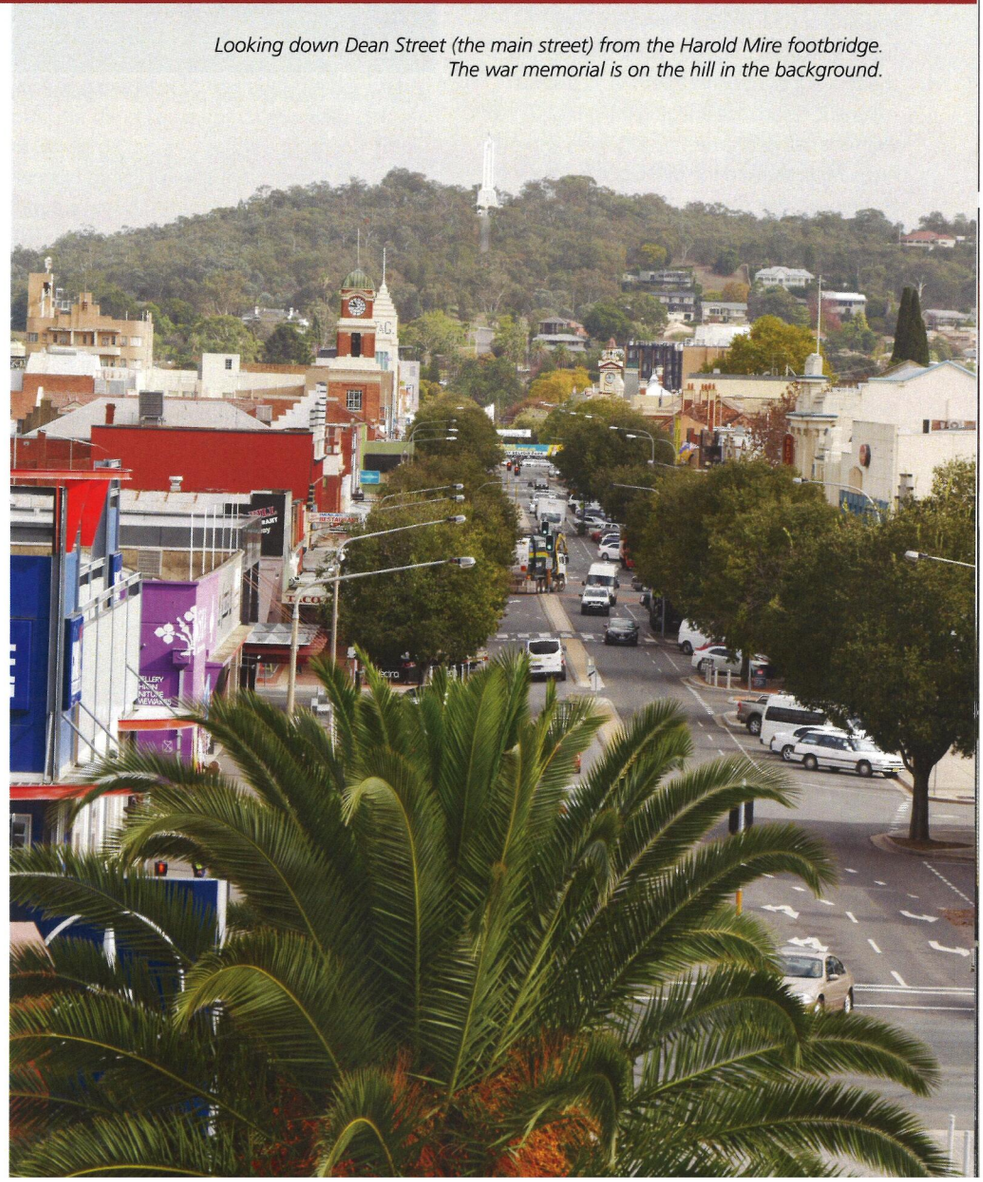
Looking down Dean Street (the main street) from the Harold Mire footbridge. The war memorial is on the hill in the background.



symptoms), most beekeepers aren't aware of its consequences: starvation, early death, poor development of the hypopharyngeal glands, changed foraging behaviour, queen supersedure and larval infections.

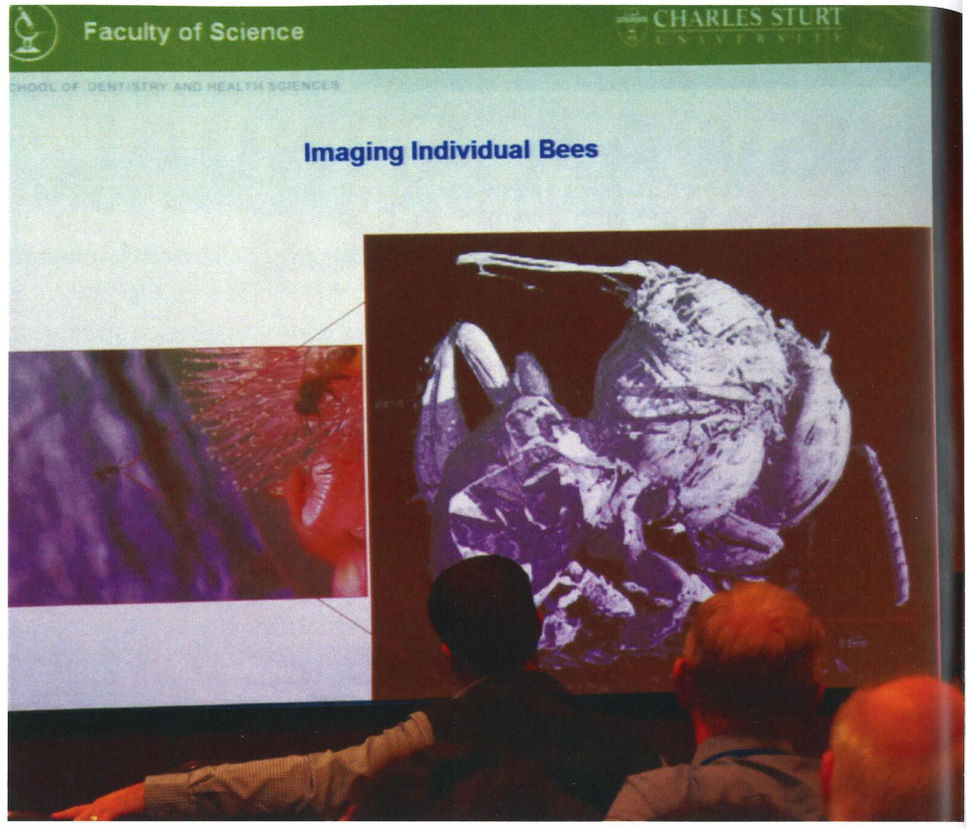
New Zealander Hayley Pragert, Plant Health Australia's recently hired NSW Bee Biosecurity Officer, talked on her research of how oxalic acid dribble works. I won't tell you the details now but hopefully when she has written up her paper, we will be able to publish it in *The New Zealand BeeKeeper.*

In talking to Hayley, she said she went from being under the radar at last year's ApiNZ conference to being in the full limelight in NSW. She has yet to acclimatise from a warm Auckland to Orange (inland NSW), where winter highs can be 2°C. We wished Hayley well in her new job.

Looking at bees via MRI

Another fascinating presentation was given by Dr Mark Greco, senior lecturer in Medical Imaging at Charles Sturt University. His topic was 'dissecting bees without touching them'. A hobbyist beekeeper, Mark used his magnetic resonance imaging (MRI) facilities to examine native bee nests in log hives and nuc hives. Mark showed the difference in imaging techniques over the last 20 years: he now can look at an individual bee in a hive. Normally when imaging bees, you destroy the bees but Mark's method doesn't kill or touch them.

Mark looked at a 22-million-year-old bee in amber scanning at very high resolution and determined it hadn't changed much, as it was closely related to the a stingless bees of today. Although dried up, it still had muscle structures and the image showed the hollow inside of the bee abdomen. The next time you want to know what's going on with your bees, wrap the hive in a blanket and book it for an MRI examination.



A 22-million-year-old bee preserved in amber. It's not much different from the stingless bees of today.

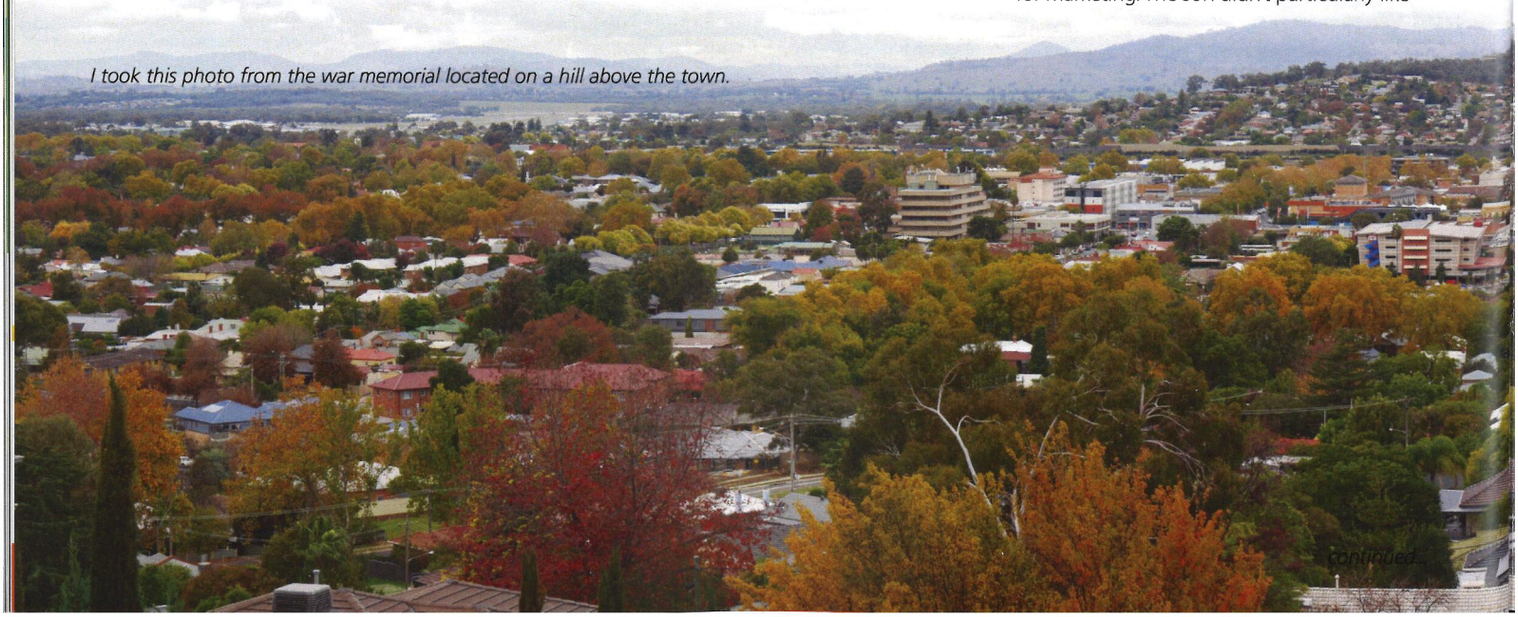
Achieving business potential

Pip Job presented on 'Social barriers to achieving'. Pip is the Project Manager Resilience with the NSW DPI and the recipient of the 2014 National and NSW/ACT Rural Industries Research and Development Corporation (RIRDC) Rural Woman of the Year award.

This excellent presentation opened our eyes. The NSW Government has services available to farmers in time of stress. They also look at strengths/weaknesses/opportunities/threats (SWOT) scenarios, which Pip said we don't do often enough in our own businesses.

Pip presented a case where a farm was being operated by a husband and wife and their married son. Each member of the business was interviewed separately to find out what they liked and to access their potential.

The son was still being told what to do on a daily basis. The farmer was 85 and his son was 53. The son's wife worked off-farm and had a marketing degree, yet her skills weren't used for marketing. The son didn't particularly like



I took this photo from the war memorial located on a hill above the town.

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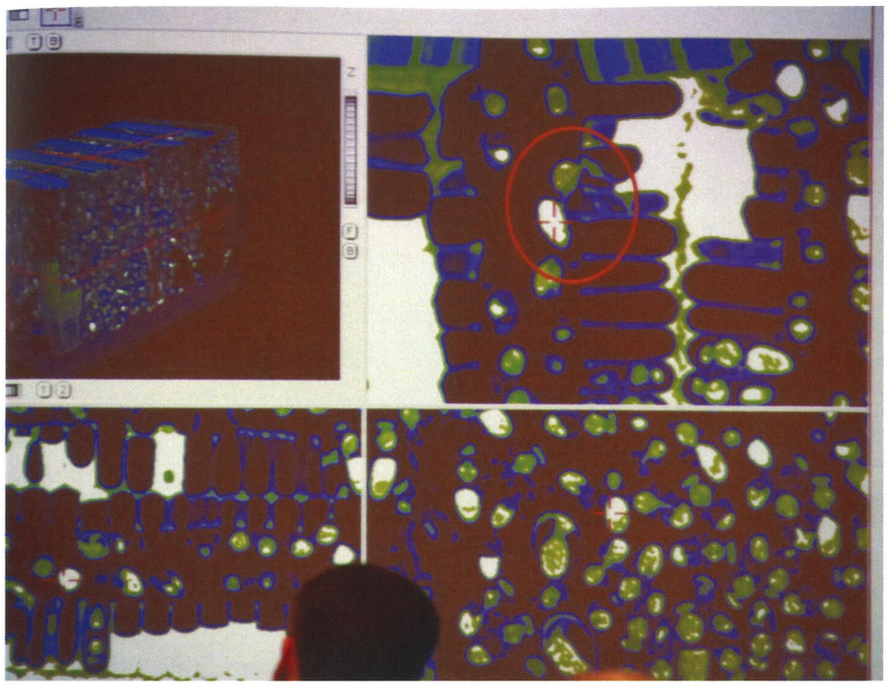

Slide of bees in a hive, showing where bees put nectar. The individual bee circled shows its abdomen full of nectar.

stock breeding so when the farmer retired, the business was going to suffer or they would have to employ a farm manager.

The take-home point is to do what you really enjoy and let others who were keen on other aspects of the business (like marketing) to do these tasks. Succession planning is also important. Do it early.

Stingless beehives

Apart from *Apis mellifera* bees, having a native stingless beehive was becoming popular. Australia has 11 species extending from the tropics in the Northern Territory and 'top end' down to the Sydney coast.

These bees are fascinating. They have virgin queens (princesses) in hives most of the time, along with a laying queen in case of queen failure. They defend the hive by locking their jaws on a predator so that both the bee and predator die of starvation. Some make cells of wax while others use resins (propolis). They make entrance tunnels that can either extend into the hive or externally to deter ants, etc. They also use propolis as a defence, coating an intruder that gets into the entrance of the hive.

The NSW DPI is looking at producing a booklet on looking after these bees. In the meantime, you can read *The Australian Native Bee Book* by Tim Heard. This informative book covers all the species of stingless bees, including how to make nesting boxes and care for them. See more at http://www.nativebeebook.com.au/

Fungicide administration trial

'Flying Doctors' was another topic presented by Dr Katja Hogendoorn from the School of Agriculture, Food and Wine, The University of Adelaide. Researchers there have trialled a Swedish device on the front of the hive to use honeybees to deliver fungicides to flowering crops.

Dr Hogendoorn suggested that this device can be used for apples, pears, cherries, almonds and strawberries when in flower. Foragers pick up a minute amount of fungicide on the way out of the hive: the device diverts the outgoing bees through the fungicide, and has the same effects as a spray application. Now it just needs to be adopted by the beekeeping and horticultural industries.

Growth of the almond industry

The almond industry is getting bigger over there every year. NSW and Victoria are the only growing regions in Australia. Companies (like Olan) are planting an additional 1,000 hectares this year, with more planned in years to come. This means that the almond industry will need 85,000 hives by 2020. Trees carry two crops each year: those bearing fruit now and the buds for next year. Fifteen percent of spur growth dies.

As in the USA, Australia is looking to plant pollen sources for the bees. We were told about a trial where strips of canola were planted to provide an alternative source of pollen but the timing wasn't right and the canola flowered after the bees were removed.

The current practice in Australia is to not administer sprays during almond flowering when bees are present. Pollination prices are around $90 per hive with 10 frames of bees.

continued...

Options for arranging pollination hive research were presented. Spreading hives around in smaller placements worked better than large placements.

The future of the almond industry was discussed. Strategies included fostering diverse ecosystems within the almond orchards, using remote sensing to audit hive strength, feeding sugar syrup, undertaking artificial pollination, developing self-fertile almond varieties and more.

We travelled to Mildura and saw the massive increase in almond planting on the Victorian side. Olam is a global agri-business firm (they sponsored the conference dinner) that has put in a massive de-shelling plant near Carwarp that husks 70 tonnes an hour. We saw grain storage pits normally used for wheat, full of hulls that contain 20% protein and can be mixed with other products to form a cattle supplement.

Effects of cotton production on beekeeping

Beekeepers were telling us that cotton production is spreading in NSW to the detriment of beekeeping. Beekeepers can't place hives close to cotton areas as the constant spraying kills them. They are moving into areas close to the major river systems (cotton requires a lot of irrigation), which are also major producing areas and where beekeepers put a lot of hives.

Unlike in Victoria, the NSW Parks Service and Forest Service still haven't come up with an industry agreement for the placing of hives into parks and forestry. During the last 10 years there has been a policy to exclude hives from parks as sites become vacant, and now they have put some sites up for tender. The first few tenders brought in a lot of money from beekeepers securing pollen areas rather then honey production areas. These beekeepers pay their tender fee every year, even though some species only flower on a three- to eight-year cycle, all of which depends upon decent rain. At the moment some parts of inland NSW are in a three-year drought and beekeepers are not producing a lot.

Sprays

Bayer has brought out another systemic spray that combines three of the worst systemic insecticides. Australian beekeepers are worried by this development. Overseas manufacturers say that Australia is not having trouble with these sprays, but in fact beekeepers are. Beekeepers estimate they have lost thousands over the last few years to spray poisoning. Their problem is that beekeepers are not reporting incidents to the government, so chemical companies are using these statistics to promulgate that these sprays are safe.

New Zealand is facing the same situation in with spray deaths and hive thefts. If you experience spray deaths, report them immediately to our EPA *[see bottom of page 3 of this journal for details]*. Report hive thefts to the Police.

Other observations

I wrote this in late May while I was still in Australia, and they hadn't experienced winter yet. Some eucalyptus species are flowering out of season. I met a beekeeper who was going home to prevent his hives from swarming. These hives were on the South Coast and had filled an eight-frame super with honey in 12 days. His hives are three high and full of bees. The beekeeper had put in some foundation frames in the bottom box to slow down brood production, but the bees had built these frames out.

He was experiencing good nectar flow, with good pollen coming in and hives full of bees, so they have started producing queen cells. I suggested that he should look at breeding queens given that daytime temperatures were still high. With beekeeping you let the bees guide you on what to do.

Even though some beekeepers weren't making a lot of money, the participants at the conference dinner raised $23,000 to assist one of their wheelchair-bound beekeepers to fund a four-wheel-drive chair with accessories, thus enabling him to work bees again as he didn't qualify for government assistance.

The conference had a well-attended display with a few New Zealand companies represented. There are still a number of other State conferences to be held in Australia. It's well worth a trip over to the 'big island' to learn and meet beekeepers. Take lots of photos of presentations, as it's hard to remember things without aids.

Are you worried about hive numbers on wintering sites? We saw some hives in a property along a back road, stopped and counted over 700 singles in the apiary. There were four hives to a pallet, with some pallets stacked two high.

Visit to Beechworth Honey

The two Beechworth honey shops in Beechworth, Victoria, are well worth a visit. They are located about half an hour south of Albury–Wodonga and two and a half hours from Melbourne. Check out their great website http://www.beechworthhoney.com.au/

Just like Carterton in the North Island, the township attracts tourists in their hundreds. The old shop sells honey and beehive products. The speciality of this shop is the tour, which has different rooms each showing the processes for producing honey.

The newer shop is located in the old bank in the middle of town. It has a cafe, children's play area (with smokers and other gear), a teaching school, a plant garden, wild bee hotel, etc.. The shop sells only Australian honey, bee products, books and items geared to tourists.

In a private room just off the shop, Jodie Goldsworthy (Apimondia Oceania Commission President) has her library, as well as Gretchen Wheen's library of beekeeping books: http://www.wheenbeefoundation.org.au/

Approximately 700 hives wintering. All are single eight-frame hives on pallets of four, with two pallets pushed together, some stacked two hives high. These hives were about to be moved north in preparation for almond pollination.

Beechworth Honey's new shop displays, using eight-frame beehive boxes.

We were privileged to be allowed to have a look around, and yes, I purchased a couple of books. *The Australia Native Bee Book* by Tim Heard (ISBN 978-0-646-93997-1 paperback, or go to the link previously mentioned) is absolutely fascinating. And the *Gardener's Companion to Eucalypts*, by Ivan Holliday and Geoffrey Watton, allows you to identify eucalypts commonly seen from the road.

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L to R: Danielle Lloyd-Prichard, Jodie Goldworthy (Beechworth Honey), and Elizabeth Frost in Gretchen Wheen's library. Danielle and Elizabeth are education officers, honey bees, Tocal College, NSW Department of Primary Industries. Photos: Frank Lindsay.

HOBBYISTS' CORNER

FROM THE DEEP SOUTH

Murray Christensen, President, Southland Bee Society

Due to a balmy autumn, wintering down has presented some extra challenges this year. Even here in the deep south, the bees have been very active and have consumed a lot of winter stores and syrup over the last couple of months. Wasps have also been very active this autumn. Extra vigilance will be required over winter to ensure some colonies don't run out of food. I have already fed more syrup per hive than would usually get me through to spring.

Heritage Harvest Festival

Southland Bee Society has continued its work in the public arena. Since our successful weekend of events at Limehills School in February, we have kept the momentum up with an outing at the annual Heritage Harvest Festival in Riverton in March. We set up a stall with honey tasting, honey sales, lip balm sales, raffles and our big display hive. Volunteers manned the stall both days, engaging with the punters while we ran Introduction to Beekeeping workshops. The workshops as usual proved very popular, as did the stall. Once again, some new members were enlisted and some prospective beekeepers took the first step towards hive ownership.

I remain amazed at the number of people that want to know about bees and how to get started into beekeeping. It gives me a real buzz to be able to help get these 'newbees' get started and to support them while they find their feet.

The Willow Project

Meanwhile, we have been working on a new project for the Society. The Willow Project will hopefully generate some income to fund our ongoing work, instead of having to apply for funding each time we want to run an event.

We have formed a partnership with the New Zealand Dominican Trust Board who own a property on Findlay Road, near Invercargill. The Dominican Trust property hosts various local community groups, now including the Southland Bee Society.

We held a working bee on 14 May to fence a shelterbelt across one paddock and in coming weeks will plant a variety of willow cultivars that will double as a wind break and as a source of cuttings for us to grow in a plot on the property. We have already established and filled four large planter boxes with a propagation mix. Each winter we will propagate cuttings to be sold to farmers, beekeepers, lifestyle block holders and so on. We also will have a club apiary on the property. Some hives and equipment have already been donated for the apiary.

Southland Environment Award nomination

We are very excited to have been nominated for the Southland Environment Awards this year. The judging process is taking place over the next few weeks. Our brains trust have prepared a PowerPoint presentation which we delivered to the judging panel. There's nothing else we can do now except wait to see if we impressed.

Although we are not here for the public recognition, it would look good on the CV all the same. Fingers crossed!

Looking forward to conference

With winter finally upon us and the thermals have come out of the bottom drawer, I am looking forward to heading away to conference for a break and to see what I can learn. I'm sure it will be very informative.

TELL US ABOUT YOUR CLUB'S ACTIVITIES!

We are keen to publicise the activities of clubs that are members of Apiculture NZ, because we know that you're doing excellent work in your communities.

Send your reports and photos (high-resolution and ideally 300 dpi) to editor@apinz.org.nz

Willow propagation area working bee. Photo: Sister Judith Robinson.

REGIONAL HUB REPORTS

FROM THE COLONIES

AUCKLAND HUB

A new committee can be a way to move away from the past niggles, bring fresh ideas, new energy, and a new voice to express concerns or support.

Some like a challenge, and the future is always that, but how we handle the future and the challenge is up to us. Sometimes a new committee may have a lot to learn, but with support and sharing of what has worked, this can build one's knowledge.

Even in our beekeeping we can always learn. Time for some R & R.

Reflection, review, records review, repair, replace, redirection, research, rest, read, relaxation.

Or time to rock and roll.

- Kim Kneijber, Hub President

WAIKATO HUB

As I write it is still early in June, officially winter and the lowering temperatures confirm this. However, the bees here are still foraging each day, particularly in our more urban situation where there is a variety of garden flowers to enjoy. The *Sasanqua* camellias *(Camellia sasanqua)* are a good source of bee feed and some of the early spring varieties have started to open too. There are a few beekeepers still doing the last of their extracting: hopefully they will have finished before conference.

The Waikato Hub of ApiNZ has held an election and a committee has been appointed. We believe it is among the first in the country. We have decided to seek ideas from the Waikato membership as to what they want by sending out a survey, and this process is already under way. No doubt there will be more ideas to explore when we meet at conference.

- Pauline Bassett, Life Member

POVERTY BAY HUB

Flats disease

This autumn has seen more flats disease (unexplained bee die-offs) than we have seen for many years. It is also more widespread and is affecting some areas on the flats that were previously thought of as safe. I think the long, warm autumn the East Coast has experienced has made things worse because the bees are out and about more, collecting whatever is available. Gisborne has had this problem in some areas since 2004.

What we are seeing is a large number of dead bees on the ground in front of the hives and a massive drop in bee population inside the hive. Not all the hives with the drop in population have large numbers of bees outside. In some apiaries all the hives are affected to some degree, while in others only about half are affected. The hives drop from about 15 frames of bees down to two or three frames of bees (where have the other 20,000 plus bees gone?). The queens are still laying and some brood is still hatching out. So far to my knowledge six beekeepers with 11 apiaries and 250 hives are involved. *[See photo page 31.]*

The extent of the problem came out at our Hub AGM when beekeepers shared information. Too many beekeepers keep this information to themselves when it should be shared. If there is a big problem, it needs to be investigated.

We have sent samples of live and dead bees, capped and uncapped honey for investigation. No results have been reported at the time of writing this. The Hub thanks Dr Chris Pook, Don MacLeod and Dr John McLean for their assistance with this investigation.

Giant willow aphid

Aphids still are reproducing on willow trees, although the numbers are dropping quickly as of early June. The hives that filled up on willow dew are going into the winter quite heavy; let's hope they eat it and clean the residue out by spring.

- Paul Badger, Hub President

Dr John McLeod took these photos. John says, "I was out looking at a willow stand on 4 June and found several giant willow aphid colonies. Of the 250 life stages seen, three were adults giving birth to young: that would make 253! We have a problem as these aphids are now widespread throughout New Zealand and the honey dew they make in the summer is readily collected by our honeybees. That makes for lots of unextractable crystalline honey in the frames and black sooty mould on the tree branches."

Dead bees outside of a Poverty Bay hive. Photo: Dr John McLean.

HAWKE'S BAY HUB

Hawke's Bay is now gripped by a serious winter drought and farmers are doing it quite tough. Some north-facing hills are completely brown and even those areas that are green have very little growth. Given that there has been no clover germination, it does not bode well for next season. At least there is no trouble shifting hives around.

I was shown a video of a wasp nest the other day that was 3 m x 1 m and that was just what you could see on the surface. I'm glad it wasn't me who had to abseil down and poison it. *[Editor's note: this isn't the same video as described on page 19.]*

- John Berry, Hub President

BAY OF PLENTY HUB

At last we have had a run of cold weather, with snow on the mountains and frosts in the Bay of Plenty. The kiwifruit industry is having trouble getting the fruit off the vines with the intermittent wet weather and the run of frosts has put extra pressure on the harvest.

Most beekeepers I have talked to have wintered down well with good stores and bee numbers. I have heard a few grumbles about the willow honey dew but have not had much experience with it myself. Wasps were becoming an issue at the end of the season but the new baits seem to have worked and hive loss has been minimal.

I look forward to catching up with everyone at the Rotorua conference.

- Bruce Lowe

continued...

NELSON HUB

Winter is finally here, after a mild May where temperatures were 2°C higher than the average for the month. The positive aspect is that most beekeepers will have had plenty of good days to winter down hives, and the need to visit or go to apiary sites is now less urgent unless checking food stores. Time to sort some gear and do some repairs.

When this goes to print we will have a newly elected Apiculture NZ board. I hope this new entity serves the industry well, as there are several issues that need guidance and direction.

The local Nelson Beekeepers Club this month had one of the highlights of the year, the annual honey competition. Over 50 entries were received for the three categories. The judges definitely gave their taste buds a workout; thanks to Murray and Leonie for their dedication to the task. Despite the mead category having more entries than previous years, there still wasn't a drop left after the group tastings. Something we may need to improve on next year.

For all those going to the conference, have a great time, make some new contacts and think about a few ideas to benefit the industry.

- Jason Smith

CANTERBURY HUB

The inaugural AGM of the Canterbury Hub of Apiculture New Zealand was held Tuesday, 31 May at the Hornby Working Mens Club. Officers elected were President: Barry Hantz; Secretary: Maggie James; Treasurer: Charlotte Mundy. On industry matters, a general discussion followed and a good catch-up was had by all.

Mention should be made of the team of dedicated branch people that was the Canterbury Branch of the National Beekeepers Association. Over the past 15 years or so this team has organised national conferences, field days, discussion groups, guest speakers to meetings and also has updated members of news from the NBA Executive. A special mention should be made of Roger and Linda Bray for their unstinting commitment and also to Trevor Corbett for his many years as Treasurer.

Winter has arrived with a thump, with frosts of below minus 3°C, but the days have been sunny. Some early snow can be seen on the hills due to a brief but heavy downpour towards the end of May. Winter feeding has begun in early autumn for some mid-Canterbury beekeepers because of insufficient nectar flow to fill brood boxes. Land has been accessible for getting into sites. The bees are bringing in light yellow/green pollen. Ivy and red flowering eucalyptus are in flower in the South Canterbury area.

A lot of things are going on in the industry for beekeepers to be aware of. Landowners are now in on the game and want to be informed with a focus on forming a relationship with beekeepers.

One of the main packers in Australia has recently imported honey from China. Keep informed by attending Hub meetings, as a lot of good information is being shared.

Handy hint: If you are using new coffee sacks or suchlike for smoker fuel, don't forget to hang some out to weather for use in the spring as they will light and burn better.

Don't forget to take your winter break.

- Noel Trezise

ABOUT THE APIARY

CONSIDERATION, CONTEMPLATION AND CLEANLINESS

Frank Lindsay, Life Member

Winter has arrived with lots of rain and the odd snowfall on the ranges. There is very little heat in the sun now, but the bees are able to fly for a few hours on still, clear days. The weather has been relatively mild for this time of the year. Pollen is coming in, indicating that brood production has started or is continuing in the hives.

Keeping the public happy

I have just been up north to celebrate a birthday and it's very noticeable that there are far more beehives around and along the fence lines of major roads.

Yes, it might be easier to work them in these locations but apart from making these a target for thieves, there is also a health and safety aspect you should consider when placing hives close to roads, footpaths, and parks. Under the new regulations for the Health and Safety at Work Act, we are not to endanger the public in their normal activities.

Working bees in some situations (just before a storm, during robbing season) stirs them up and it can take a few hours for colonies to settle down again. The farmer, a road contractor or cyclists can be involved in a stinging incident through no fault of their own.

Some councils are now insisting that 'all' hives be placed 40 metres back from road boundaries following a few complaints from the public. As an industry we wouldn't want to see this implemented countrywide as this could rob us of valuable sites, especially in the steep backcountry.

Consider the public and place hives out of sight from the roads, behind hedges or a suitable barrier so that the principle of 'out of sight, out of mind' prevails.

Consider the public and place hives out of sight from the roads, behind hedges or a suitable barrier so that the principle of 'out of sight, out of mind' prevails. It's also healthier for the bees if they are placed in a sunny, warm, sheltered spot, close to a water supply. Perhaps we need to institute a code of ethics that includes best practices.

The hobbyist starting off faces the same predicament: 'can I have a hive in the garden?' Councils generally will allow you to keep bees provided they do not create a nuisance.

Check with your neighbours to see if they are allergic. Most people will say they are allergic as they swell with bee stings, but this is a normal reaction even if a whole limb swells. The person we have to be conscious of is the one that carries an epinephrine autoinjector (epipen) and needs adrenaline immediately after being stung. If this is the situation, then you will need to find another spot to locate hive(s).

Place hives in a sheltered, sunny spot in the garden at least four metres away from the boundary. Again, the general rule is 'out of sight, out of mind'. Perhaps plant runner beans on a trellis to take the neighbours' focus away from seeing the hive. If bees are forced to fly over people's heads, they are far less likely to come into conflict with humans. Face the hive so the bees' flight path is away from the neighbours' washing lines. Provide a water supply for the bees—we don't want them visiting a neighbour's swimming pool. Put in a small pond with water lilies or hyacinth before the bees arrive before you take possession of a hive.

The only spot you may have could be on a balcony or carport roof. Supers of honey are heavy, but there are ways of managing this by putting frames of honey in nuc boxes and carrying these down safely.

It takes about five years to learn to be a beekeeper.

Some of you might not be able to have your own hive, but you can still enjoy bees by planting a garden and teaming up with another beekeeper close by.

It takes about five years to learn to be a beekeeper. There are so many aspects to beekeeping that you never stop learning.

Managing a new beekeeping business

We are starting to hear stories (and I hope they are just stories) of new beekeepers expanding too quickly, getting in debt too deeply, having a bad production year and losing their main asset: their home. Banks won't lend on something that is not permanent and beekeeping is a 'risk occupation' as far as they are concerned. Hives are there one minute and gone the next—all that is left are wooden boxes. It has taken years of negotiations for banks to lend on a percentage of honey in storage.

Some years you can do beekeeping by the numbers (do this on this date, and do that on that date), but often climatic conditions change from season to season and a lot of skill is required when things don't go to plan. Any good beekeeping book or commercial beekeeper will tell you to hold at least a year's income over for that bad year. When this happens we look for alternative sources of income: melt down old frames, scrap boxes for propolis, sell bees for export or even sell a few hives. Some may need a second job. In fact, it's best to keep working while hive numbers are built up. You learn to work hives on weekends in the rain with an umbrella over the hive.

The skill in beekeeping comes with timing your peak hive population with the honey flow (when most of the sources are flowering and producing nectar). If you make a mistake and your bees are building on the flow rather than storing a surplus, or if you peak them too early, they swarm into the trees.

The skill in beekeeping comes with timing your peak hive population with the honey flow

Queen bee in a hive in Nelson. Photo: Elliott Kennedy.

Look up the production statistics for a given area and halve these if you are starting out.

Some flows dribble in with not enough to cause the bees to draw wax foundation, so when honey boxes with drawn frames are put on, the bees chimney up the middle. Then there are a few flows we all remember when the bees filled everything with honey. In Canterbury they used to refer to '10 tonnes per 100 hive' years, but these are no more with changes to agriculture and the introduction of dairying. In fact, I believe honey crops are reducing because of different farming techniques and overstocking of hives.

Look up the production statistics for a given area and halve these if you are starting out.

Your most valuable asset is drawn comb and it can take a few seasons to accumulate enough for a good flow. In the meantime, your hives are using the honey they produce to draw comb or you can get comb drawn by feeding sugar syrup. However, you can't do both in a season without the bees suffering or you getting pinged for having C4 sugars in your honey.

This is why most books will advise, if contemplating going into beekeeping, to work alongside another beekeeper for a couple of seasons, making and discussing the decisions on how hives are managed. A couple of seasons of 'fetch and carry' is good for the beekeeper but doesn't improve your knowledge much, as you haven't made the decisions and seen their consequences. Because we tend to manage apiaries as a whole, one mistake can reduce your production and put you back a year in your plan. That was the motivation behind my article in the May issue: make haste slowly (Lindsay, 2016 May).

continued...

Tips for a clean, safe honey plant

Most have finished extracting, cleaned up their plant and covered it so that it's ready to be sanitised again just before it's used next season. Use a bit of food-grade (approved) oil on chains and where frames run to reduce friction. Just before you start, use a blow torch to remove any spider webs under tanks and in tight corners. I was told by one Australian auditor that he always looked under tanks and equipment, as this tells the real story on cleanliness. Don't just walk out the door after doing this, as you might have touched something that burns.

Fire is the one fear we all have with honey plants. Farmers lose barns to rats eating through wiring and birds nesting in tractors. Most of us use steam as it's safer but in the honey house, moisture put into the air from the honey droplets or sticky hands during extraction can build up in 230-volt switches and sockets. Every couple of years, have an electrician check them and clean them with a solvent. I had one light switch I used extensively with wet hands fizz one year after turning it off. Plastic fittings burn within a couple of seconds when they short. I was lucky that I was still there when it happened.

Replace fuses with circuit breakers and ban multi-boxes. Most fires can be attributed to an overloaded multi-box. If you have to use a multi-box, make sure it's fitted with a circuit breaker. The most you can put on it is one fan heater.

Fire is the one fear we all have with honey plants.

Vehicle maintenance

While the truck is not running, give it a complete check over. Check that all the nuts are tight and tyres are in good order. Change the oil, filters and fluids and bleed the breaks. Vacuum the seeds from the radiator and change the water. Fix those little things you put off because you were too busy during the season.

Carry chains at this time of the year. It doesn't take much to get stuck and even snow chains can get you out of a sticky situation. Don't be shy about asking for help when you are stuck. I tried for an hour to get myself out of a hole using chains, strops and tensioning everything with a fencing strainer. I had to give up and ask the farmer who had me out in a minute with his tractor and a chain. The odd pot of honey goes a long way to sweeten things.

Things to do this month

Sort out old combs and render them down. Purchase new frames. Purchase plastic frames early so the plastic smell has time to reduce. Waterblast dark plastic frames and re-wax. Make up new gear (bases, roofs, split boards, feeders, etc.) ahead of spring.

Check your hives after storms. Make sure cattle haven't knocked any over. Heft each hive to check its weight. If there's been robbing, check hives for varroa. Look around the grass for bees without wings or those that can't fly—'crawling death'. If you are losing pollen-laden bees because they are landing short, add a board in front of the hives so they can crawl in. Keep the grass around hives short. Order spring queens.

Talk to your farmers and ask about planting willow stakes along the fence line close to your apiaries. There's lots of pussy willow around, so take two-metre-long cuttings from these. You should see the results in your hives in about four years' time.

Winter is also a time to get a little education. Check the FarmSafe website for training opportunities.

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OVERSEAS RESEARCH

VARROA RESISTANCE TO CHEMICAL TREATMENT

Abridged media release from Rothamsted Research, United Kingdom, 18 May 2016

One of the biggest problems facing honey bees, the parasitic mite *Varroa destructor* (varroa) is now found almost worldwide and usually kills untreated hives within three years. For varroa control, many beekeepers use the chemical *tau*-fluvalinate, marketed as Apistan®, but its effectiveness has been in decline since the mid-1990s. Scientists studying varroa mites collected from Florida and Georgia, USA, have identified two new mutations that give the parasites resistance to tau-fluvalinate. The discovery of the two mutations enables testing of varroa populations to determine whether control with tau-fluvalinate will be effective. The research was carried out by scientists working in Spain, the USA and Germany in collaboration with a team at Rothamsted Research, which is strategically funded by the Biotechnology and Biological Sciences Research Council (BBSRC). The study is published today in the journal *PLOS ONE*.

Honey bees are pollinators of many wild plants and crops important in human nutrition. A scourge of honey bees, the mite *Varroa destructor* was originally confined to the Asian honey bee, but shifted to its sister-species, the European honey bee, in the first half of the twentieth century and has since spread across the globe. The mites feed on the body fluid of adult and immature honey bees, transmitting bee viruses such as deformed-wing virus. Varroa causes severe damage to honey bee colonies and is one of the biggest threats to beekeeping. The varroa mite is a key factor contributing to declining numbers of honey bee colonies in Europe and North America, which may lead to problems in achieving adequate pollination of crops and wild plants.

Mite-killing chemicals like *tau*-fluvalinate are used in varroa control schemes, along with other chemical and physical methods, but the development of resistance to the compound has been widely reported in the parasites. Like other pyrethroid chemicals, *tau*-fluvalinate interferes with proteins called voltage-gated sodium channels involved in generating electrical signals in nerve cells. In susceptible varroa mites, pyrethroids cause overstimulation of the nervous system resulting in death.

The scientists previously found that resistance to pyrethroid treatment has evolved in varroa from central and southern England through a mutation altering a single letter in their DNA, which causes a change in the structure of the sodium channel at the proposed binding site of pyrethroids. The new study shows that a pair of mutations affecting the same part of the sodium channel have evolved in the American varroa populations, different from the mutation seen in England. One or both of the newly identified mutations was found in 98 percent of the varroa from Florida and Georgia that survived treatment with *tau*-fluvalinate.

Note from Frank Lindsay

Dr Mark Goodwin has warned of varroa resistance developing to Bayvarol® and Apistan® for a number of years. Beekeepers should test a number of hives using the Pettis Test Protocol 1998. For details, refer to http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/animal-and-crops/animal-production/bee-assets/api_fs223.pdf

Source

Media release from Rothamsted Research, United Kingdom, 18 May 2016. What makes the varroa parasite of honey bees resistant to chemical treatment? Retrieved May 30, 2016 from http://www.rothamsted.ac.uk/news-views/what-makes-varroa-parasite-honey-bees-resistant-chemical-treatment

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Regional Hubs officeholder contacts are current as of 25 June 2016.

IF YOUR DETAILS **HAVE CHANGED...**

...please email editor@apinz.org.nz and info@apinz.org.nz so that we can update your details in the journal and on the ApiNZ website www.apinz.org.nz.

www.pharmapac.co.nz

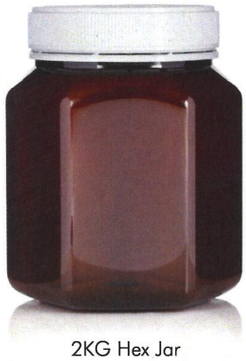
pharmapac™

500g Tall Round Jar

500g Round Jar

340g Round Jar

250g Round Jar



2KG Hex Jar

1KG Hex Jar

500g Hex Jar

250g Hex Jar

2KG Square Jar

1KG Square Jar

500g Square Jar

250g Square Jar

New Zealand's most extensive range of honey packaging

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We are continually developing new products & services based on the feedback and requests from our customers.

Our stock jar colours are amber & clear. Stock closure colours are white, blue, gold, green & black. Custom coloured closures are available (minimum orders of 5000 units will apply). No supply contracts are required.

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