AUSTRALIA'S

HONEYBEE NEWS

"The Voice of the Beekeeper"

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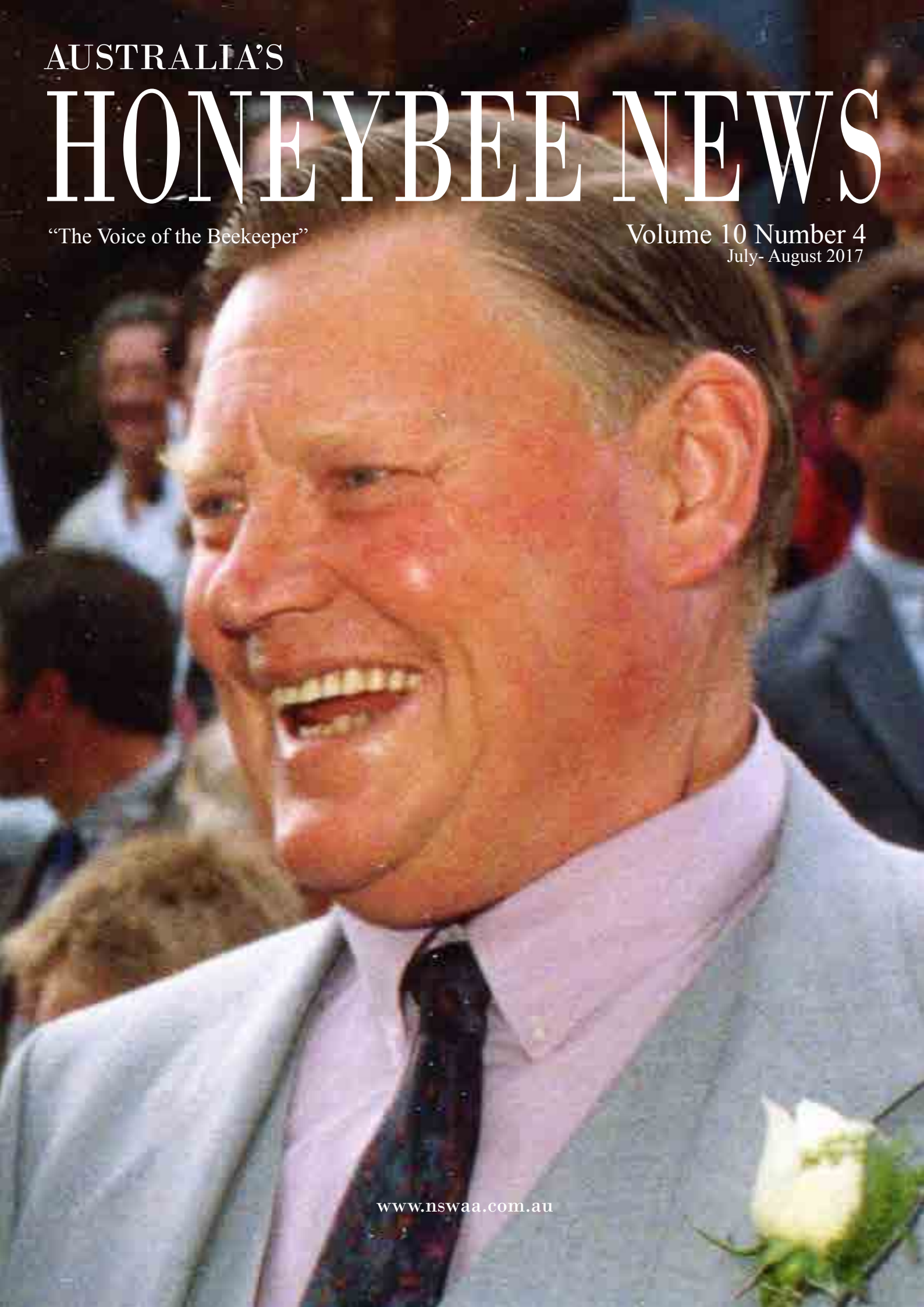

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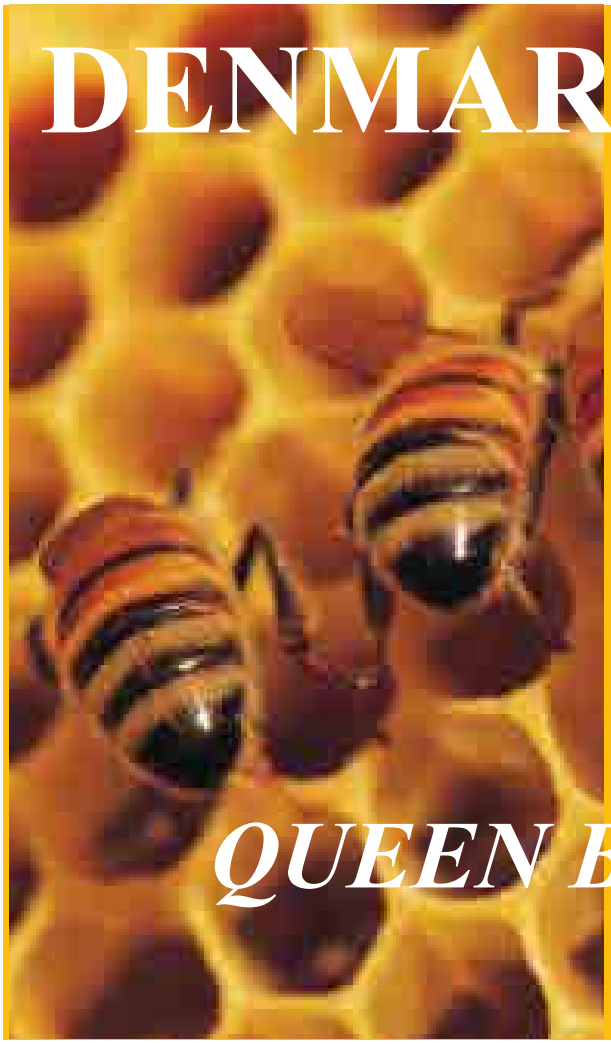

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PRESIDENT'S REPORT

Season
Extremely dry conditions have prevailed over much of NSW during the preceding three months causing concern for prospects this spring. Canola has struggled to survive and some eucalypts have either started to abort buds and are flowering early. Hopefully the rain that has fallen in the last week will help alleviate this dire situation.

DPI
Registration costs
It is disappointing and frustrating that the NSW DPI has increased the beekeeping registration fees from $40-60 for recreational beekeepers to $120 ($90 online). This was done without any discussion with our organisation and without consultation with the Amateur Beekeepers Association. We had only recently approached the DPI asking for them to consider making the 1 to 10 hive category free to beekeepers so as to encourage the voluntary registration of recreational beekeepers particularly around our high risk ports. It has long been recognised that we are likely to suffer further incursions of exotic pests particularly varroa mites in all probability through the major ports, the very regions that recreational beekeepers reside and keep bees. It is in the beekeeping industries best interest that the government and its departments do everything in their power to encourage registration not deter beekeepers from registering. From previous reports possibly half of the recreational beekeepers are historically unregistered.

This action by the DPI is not likely to help anybody and will invariably lead to less recreational beekeepers paying the high registration fees.

Canola and Pesticides
Due to the extremely dry weather over winter the canola crop is suffering and not looking very promising. As each day goes by without rain the value of this crop to bees diminishes. What is of extra concern is that stressed canola crops often attract greater pest pressure. This may encourage some growers to utilise insecticides during flowering. If your bees appear to have suffered from a pesticide please immediately contact the EPA on 13 15 55. Also please contact one of the executive and inform them of your issues and your response from the EPA.

Our industry has received mixed responses from the EPA regarding bee kills in recent years and is keen to chase up with the ministers and the relevant departments on matters where the department officers clearly dismiss their duty to investigate bee kills because ***they*** don't see it as relevant.

Executive meeting
The executive will be meeting in Orange on 1 September. We hope to be able to discuss the progress of the single desk re apiary sites on public lands, the progress of Nick Annand's replacement and the beekeeping registration fees just to name a few of the agenda issues. If you have any matters that you believe require the actions of your association please contact the secretary or any member of the executive and pass on the information.

Vale Noel Bingley
My father Noel Bingley passed away on 19 July aged 85. Noel, besides being my father and mentor was a strong supporter of the NSW Apiarists' Association and along with my mother (Barbara) attended every annual conference from the mid 60s until recently when poor health prevented him from doing so.

Noel was President in 1977, 84 and 85, was an active member of the beekeeping industry and a Life Member of NSWAA. His funeral was held on Thursday 27 July and was attended by beekeepers from far and wide. I personally thank all those who made the effort to attend and who have passed on their condolences to our family. Thank you.

Neil Bingley
President

NEW MEMBERS

A warm welcome to the following:

Tanya Ananin	Eastern Creek
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Graham Beech	Biddaddaba
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Peter Brenton	Kempsey
Mary Cannard	Carwarp QLD
Titus Chang	Forestdale QLD
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Luke Coyle	Lismore
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Stephen Deegan	New Lambton Heights
Craig Dennis	Collector
Robert Duddy	Glen Innes
Rob Edwards	Barden Ridge
Uri Evans	Byron Bay
David Fairhall	Richmond Hill
Jenna Ford	Hornsby
Vicki Gow	Oakhampton Heights
Miskell Hampton	Rosemeadow
Corrine Jordan	Carbrook QLD
Ben & Leanne Laybutt	Upper Orara
David Lloyd	Lennox Head
David Lyall	Branxton
Georgina Manders	Yetholme
Simon McCarthy	Byron Bay
Neil McMullin	Wagga Wagga
Travis Mills	North Star
Tara Needham	Yowie Bay
John Newcombe	Orange
Mark Oaksford	Elong Elong
Noel Parker	Lismore
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DOUG'S COLUMN

Doug Somerville
Technical Specialist, Apiculture - NSW Department of Primary Industries - Goulburn
doug.somerville@dpi.nsw.gov.au

The Pollination Story

Where to start? This article is not the ABC and XYZ of pollination. I hope to cover much of that subject in a course that is to be conducted through Tocal Agricultural College. To accompany this course, a fairly comprehensive set of notes have been compiled. The course is unashamedly about 'honey bee' pollination. Honey bees are in abundance as far as available, managed insects are concerned. They are without doubt the kings of commercial pollination within the Australian context.

What is pollination in the plant kingdom?

Put in the simplest of terms, it is about joining the male components of the plant with the female parts. More specifically, as far as honey bees are concerned, it is about transferring pollen from the anthers (♂) of a flower to the stigma (♀) of a flower where the pollen tube grows down and the embryo is fertilised; creating the beginnings of a seed.

POLLINATION VECTORS
The interesting bits of this story are the various ways in which this all happens. For a start, the vectors responsible for transferring pollen can be a range of things. Insects and birds are the major group of animals contributing to the pollination of flowering plants, although nectar bats, flying foxes, sugar gliders and other marsupials are vectors of specific flowering species.

Australia has over 100 species of birds that feed on nectar. In this process, they are contributing to the process of pollination. Collectively insects are the dominant group of animals visiting flowering plants. Insects include bees, wasps, ants, butterflies, moths, beetles, flies and other insects. The efficiency and regularity of visits of each group of insects varies significantly.

The presence of some insects acts as a deterrent to other visiting insects. Nectar scarab beetles, soldier beetles and Bogong moths all visit flowering eucalyptus, but their presence is a major deterrent to other insect visitors, including honey bees. In the beetles' case, they do not readily move between blossoms and are more or less stationary on specific blooms for hours or days.

Bees are easily the most important group of insects in the pollination story. Within Australia we have over 1,600 species of native bee species; most of which are solitary and extremely seasonal. While they visit flowers to consume nectar and pollen, their numbers are unpredictable and variable.

The native social bees, or stingless bees, show a bit more promise. They can be housed in small boxes, which are able to be moved around the landscape. There is evidence that they are possibly very efficient pollinators of a few sub-tropical horticultural species, e.g. macadamias.

The issue with stingless bees are that:

- they are expensive per hive
- they only fly short distances
- they are difficult to obtain
- the amount of honey produced is negligible
- when placed together in an orchard, the colonies have a tendency to fight each other
- colony population is not much bigger than 5,000 individuals
- the very concept of moving these colonies around is likely to spread any pests and diseases that afflict these bees (very little is known about this aspect of keeping stingless bees).

While solitary/seasonal native bees and stingless bees offer some potential for commercial pollination purposes, honey bees (*Apis mellifera*) are here and now; about 500,000 managed colonies (or thereabouts) within Australia.

THE FLOWERS
Flowers come in all shapes, sizes and colours. Their primary purpose is to attract a pollination vector. They may provide a reward to the visitor in the form of nectar and/or pollen.

Not all flowers have male and female parts and those that do may not be compatible with each other. Each flowering species has a set of mechanisms to encourage satisfactory seed set or pollination, but also to help minimise the impact of inbreeding.

Beekeepers and growers of plants are well advised to study this process for the crops they hold an interest in. Kiwifruit, for instance, has male vines and female vines. Almonds require two or more varieties to be flowering at the same time for the pollen to be transferred across. The pollen produced in the one variety is not compatible with the female component of the same flower, and nut set will not happen if there is an orchard composed of a single variety.

Other plants have flowers that release pollen well before the stigma is receptive, to minimise the chances of the flower being self-fertilised. Even where more than one variety is required to initiate pollination, not all varieties are cross compatible.

Another frequent problem is where the two chosen varieties in an orchard or crop do not have synchronised flowering periods. Bottom line – get to know the reproduction methods of your chosen crops!

The next aspect of the flower, and ultimately fruit development, is the degree of pollen transfer necessary to create a viable economic crop. In almonds, cherries and peaches for example, there is only one seed per fruit, thus the flowers of these species only need to be visited once or twice to initiate pollination.

In kiwifruit and melons the story is more complex. There needs to be multiple insect visits to initiate the hundreds

or thousands of seeds necessary for the plant to create marketable fruit.

The emphasis is on marketable fruit. An apple flower has five segments; each requires to be pollinated to enable a well formed fruit to be developed.

The size of a blueberry depends on the number of seeds in the fruit. **A berry that has around 10 seeds weighs approximately half a gram, whereas a berry that has 40 seeds weighs approximately one and a half grams.**

Presumably it takes the same amount of time to pick a small fruit as compared to a much larger fruit, and in the blueberry scenario, you will require less large berries to fill each punnet and achieve the total target weight. Larger berries thus become a more economical proposition for growers.

Larger blueberries and well-formed apples are, in the Australian context, fully dependent on the activities of honey bees.

Another point worth mentioning is the evenness of a crop at harvest. It is not possible for broad acre cropping enterprises to harvest the seed that is ripe and leave seed pods that are still maturing.

Many flowers will remain in bloom for days until pollinated. A crop that is evenly pollinated will invariably mature at an even rate and be more uniform at harvest.

An interesting story of pollination timeliness can be illustrated with cherry blossom. Cherries flower about mid-September for 3 to 4 weeks. The stigma is receptive for pollen for over a week, but the stigma receptiveness slowly diminishes. If the flower experiences a frost event and has not been pollinated, then it is likely to abort.

Even though it is possible to pollinate cherry blossom days after it is open and receptive, it is exceedingly good insurance to take all measures to pollinate the blossom as soon as it begins to flower.

HONEY BEES

There is a lot of noise at present about alternate pollinators for commercial crops. There is no doubt that Research and Development agencies would be wise to investigate native bees and alternate pollinators but they should also stay focused on the primary insects of commercial pollination available in Australia. That is the honey bee (*Apis mellifera*).

There are approximately half a million managed beehives in Australia, owned by over 10,000 beekeepers. This industry has been around for over 100 years in Australia and there is no indication that the numbers of beehives are in decline. Likewise, the number of persons keeping bees, particularly as a recreational activity, is growing.

Australia has not experienced mass die-offs of honey bees. We do not have varroa mites (a major parasite of honey bees) which are plaguing the rest of the world's beekeeping industries.

The commercial beekeeping industry is historically reliant on honey production as its core business. Even with the growth in the provision of paid pollination services, the business reliance on honey production is not likely to change soon.

Why honey bees as pollinators?

- they can be readily transported hundreds or thousands of kilometres
- there is a huge volume of information on the keeping and management of honey bees
- there are numerous organisations that are dedicated to the keeping of honey bees
- colonies can range from 10,000 to 60,000 individual bees
- they are available 12 months of the year.
- their behaviour can be manipulated to improve pollination outcomes
- they are very hairy and social.

The last point is something that gets lost with a lot of information, including research conducted on pollination and honey bees. It is well documented that an individual field honey bee will concentrate their foraging activities within one area of the crop or row of an orchard. This observation frequently equates to the author stating that honey bees are not transferring pollen across the crop.

What they omit in these observations is the fact that honey bees are extremely hairy insects and in the process of foraging on flowers become covered with pollen grains. They frequently return to their hive during the day and intermingle with their fellow colony inmates. I mean intermingle. For anyone who has observed the insides of a hive, the colony is often one big mass of moving bees.

This social interaction transfers pollen from one furry body to another. Drone bees never visit a flower, they are essentially flying sperm banks; full stop. Studies that have counted the pollen grains adhering to these bees indicate that there can be up to 25,000 pollen grains attached to each drone bee.

What does this tell you? The pollination story doesn't stop in the field; the social activity within the colony is a critical component in the sequence of steps to pollinate a crop. This mass social activity of thousands of hairy insects sets honey bees apart from all other pollination agents or vectors.

HONEY BEE COLONY MANIPULATION

A normal colony has a laying queen bee (egg factory), thousands of worker bees and, seasonally, drone honey bees (males).

The worker bees have various functions including feeding larvae, comb construction, foraging and defending the hive to name a few.

The foraging bees principally collect nectar and pollen but also water and propolis on an as-needed basis. Nectar is the carbohydrate component of the diet. Pollen provides just about everything else, including protein, amino acids, fatty acids/lipids, vitamins and minerals.

The volume and sugar content of the nectar in flowers varies significantly, which impacts on the attractiveness to foraging honey bees. Likewise, the nutritional value of pollens to honey bees varies significantly between floral species. Combined, these factors have a major bearing on the health and wellbeing of a colony.

Some interesting points to consider:

- colonies store the nectar in the form of honey for future use

- fresh nectar collected in the field stimulates brood rearing
- increasing amounts of brood stimulates increased collection of pollen
- generally, bees that forage for pollen are more efficient at pollinating flowers than nectar gatherers (depends on species)

Along comes the beekeeper.

We can artificially stimulate a colony using sugar syrup. This then promotes brood rearing and increases pollen collection. The New Zealanders utilise this set of responses very efficiently in their kiwifruit orchards. Sugar syrup is provided 2–3 times per week in small amounts while the hives are in the orchards. This has been demonstrated to profoundly improve the pollination of kiwifruit using honey bees.

Another aspect worth considering, young queens are more prolific egg layers than older queens. Egg laying in early spring or late winter is often initiated 1–2 weeks earlier in queens reared in the autumn than queens that are older than 12 months.

Not all colonies are the same due to the genetic variation in the drones with which the queen has mated. Some colonies appear to be more efficient at dealing with various pests and diseases. There is always variation within an apiary in relation to honey crops harvested, even given colonies with sister queens of the same age.

Colonies with smaller populations are less likely to forage any great distances whereas colonies with large populations are much more likely to forage over a larger range. This behaviour could be used to pollinate a crop that is not that attractive to honey bees by placing larger numbers of smaller populated colonies within the crop.

Temperature plays a big part with any insect. Once temperatures reach 12°C–13°C flight activity is well underway. The micro-climate in late winter or early spring where the hives are located will have an enormous impact on the amount of field activities from these hives. Simply placing the hives in a sunny, protected position out of prevailing winds will ensure maximum activity from each bee hive.

STANDARDS AND AUDITS

All hives are equal! Just about any beekeeper should be able to recognise that this is rubbish and certainly nowhere near the truth.

So why does so much of the literature talk about 'how many hives to the hectare' that is required for specific crops, without also being in lock step with a definition of what a hive is?

This frequently blows me away and continues to reinforce the major gaps in knowledge and understanding of what is in a bee hive.

There have been various studies to demonstrate the increased foraging rate of increasingly larger colonies. The amount of brood in a hive will have a direct influence on the number of pollen foragers in each hive.

Various recommendations refer to hives per hectare. In almonds this is between 5–7, apples 3–5, avocados 2–3 and blueberries 2–5, just to state a few. A default stocking rate tends to be 2–3 hives per hectare. The number of hives should be influenced by the number of flowers per hectare that the bees are required to visit and the relative attractiveness of these flowers. Makes sense!

What is equally important is to have a clear understanding of what a hive is. This is not likely to be the same for all crops, for a range of reasons. Bees coming out of winter are likely to have very small brood nests and the colony is likely to be dominated by older field bees. A colony going into a cherry orchard should have had two or three fresh generations of new or young bees hatch since coming out of the winter cluster and is likely to have a reasonably sized brood nest.

A typical almond standard hive is:

- 8 frames of bees (average)
- minimum of 6 frames of bees
- sufficient stored honey
- no AFB (a bacterial disease of bees)
- an active queen

Each pollination contract needs to clearly stipulate what is the hive standard for each flowering event.

Once this is established and agreed on, it is important for the grower or broker (person hiring or coordinating the hives) to audit them on arrival. Traditionally this has been carried out on 10% to 15% of the hives. It takes time and thus cost to conduct an audit. Thus the figure of 10% to 15% is a compromise. It is not a statistically sound number to ensure that the majority of hives meet the standard. In this case to have a 95% degree of confidence that all the hives meet the standard, it would be necessary to inspect 45 hives out of 100. I have read too many research reports where the author states that the hives were inspected at the normal 10%–15% level. This unfortunately places a big question mark over the risk that not all hives were in fact up to the standard.

An audit process can be as minimalist as possible or can be highly detailed, requiring the complete dismantling and measurement of the components of the hive (brood area, frames of bees and presence of disease).

Research conducted in California clearly provides strong evidence that an invasive, time-consuming hive assessment is not warranted. The researchers found that estimating the size of the cluster of bees by removing the lid and any supers and counting the frames that bees are clustered on was ample evidence to demonstrate that the hive did or did not meet the agreed standard.

In all probability, advancing technology may mean that 100% of the hives will be audited in future, through the use of infra-red cameras. Initial trials conducted on almonds are encouraging.

THE RISKS

The biggest risk to bees is the exposure to pesticides. While there is a rigorous process to register the use of pesticides in Australia, the world scientific community is increasingly finding that many pesticides considered of low concern to honey bees are in fact likely to be having subtle to significant negative impacts on honey bees. This is referred to as sub-lethal and can be described with several examples.

Testing in the past relied on determining the toxicity of pesticides on adult bees and measuring how long it took

for a bunch of adult bees to die. More recently, it has been demonstrated that adult bees tend to have a degree of robustness or resilience but their babies (larvae) do not. The impact of the pesticide may not always kill the larvae, but may make the larvae more susceptible to brood diseases.

Other researchers are finding that adult field bees are becoming lost in the field and/or are taking a long time to find their way back to the hive.

Tank mixes of more than one pesticide appear to be of major concern. This occurs where the individual pesticides are considered of low risk to bees, but when combined become toxic to bees.

The impact of pesticides on bees can be, and often is subtle. As such, beekeepers are becoming more concerned about any exposure of their bees to agricultural pesticides.

Biosecurity is a term applied to the collective mission to control and manage pests and diseases. In the bee world there are a number of significant pests and diseases that affect honey bees.

When hives are massed together on orchards in particular, this creates a major biosecurity risk for all beekeeping operations involved. Historically, the disease that was the biggest concern in this scenario was American foulbrood – a fatal bacterial disease of bee larvae.

Many beekeepers avoid orchard areas for this very reason. This risk can be circumvented by the auditors or brokers inspecting hives on entry into the crop to ensure that all hives are strong enough to defend themselves. Even so, the concentration of any animals will automatically trigger a biosecurity risk.

The two-sided coin is the income generation potential for beekeepers to either chase honey crops or instead to provide a pollination service. This is an economic decision which will have a different set of parameters for each beekeeper. Annual agricultural flowering crops provide a regular cash flow from pollination service fees, whereas honey production can be, and is, extremely seasonal and variable from one year to the next.

NOW AND THEN

Almost 20 years ago, a comprehensive survey of NSW commercial beekeepers indicated that about 20% of the beekeeping businesses obtained a portion of their gross income from the provision of paid pollination services. In the majority of this group the ratio of income derived from pollination ranged up to 50%, but only a very few beekeepers were in the higher percentage group.

The average per cent of income derived from pollination services was 15% or less.

While there is no firm data to state what the current situation is, it is without a doubt a very different landscape. At least 50% of the NSW commercial beekeepers in NSW will probably be obtaining some of their gross income from paid pollination services. The main drivers are almonds and blueberries, but there is no doubt that other horticultural industries are becoming increasingly focused on the role of honey bees and their financial bottom line.

Blueberry plantings are scattered from Queensland south to Tasmania, but the majority of orchards are concentrated on the north coast of NSW. The demand for honey bees appears to be variable and, as a rule, larger companies and businesses are not leaving pollination to chance and are hiring the services of beekeepers. Smaller blueberry holdings, on the other hand, are a mixed bag.

As blueberries yield nectar, combined with a mild climate on the north coast when they are in flower, bees (both native and honey bees) will be attracted to the blossom. Whether this is achieving maximum fruit set is arguable unless the pollination event is actively managed. What is missing is any widespread practice of auditing the hives on the orchards.

The almond industry, on the other hand, is acutely aware of the need for and role of honey bees. They have information on honey bees on their website, they have a pollination committee within their industry organisation and various companies are actively involved with the beekeeping industry at a high level.

There is an underlying fear in the almond industry that there will not be enough bee hives in Australia to satisfy future expansion of the almond acreage. This fear appears to be driven to some extent by the goings on in California. In the USA the bee hive numbers are stretched to the limit each year to satisfy the pollination demands for almond blossom. Combined with this is 'colony collapse disorder' which has plagued the US industry.

In Australia, the maths at this stage suggests we are not in this zone yet. Statistics from the almond board web site state that there were 5,232 hectares in 2001 (equates to 35,050 hives required), rising to 31,115 hectares in 2015 (equates to 207,470 hives required). This is calculated on a stocking rate of 6.7 hives/hectare.

Of the 500,000 or so hives in Australia a percentage are located in Western Australia and Tasmania. These hives are not available to the eastern states horticultural industry due to quarantine issues.

Thus, we have around 450,000 hives available in South Australia, Victoria, New South Wales and Queensland. Roughly half are being utilised for almond pollination.

What makes us different to California is that we have major nectar flow events, mainly from eucalypt species, through the winter months in various regions of the country. These flowering events can be quite lucrative as far as harvestable honey crops are concerned.

Also, the blueberries on the North Coast are flowering at the same time as the almonds in the south. Thus, the picture in the Australian context as far as the beekeeping industry is concerned, is quite different to that of the Californian Valleys.

CONCLUSION

It is hard to conclude anything except the times are a changing. Without doubt, paid pollination services are likely to be a highly significant component of beekeeping businesses within Australia from now and into the future. This is not likely to negate the value of the income derived from honey production. The bottom line is that beekeepers have a choice. They can take or leave pollination, but growers don't have a choice – yet. Maybe research into alternate pollinators is warranted, but with 40,000–60,000 insects in a box and the ability to transport them anywhere overnight twelve months of the year, honey bees are likely to remain for many years the king of paid pollination services.

(Thanks to Vicki Saville for typing my notes and Annette Somerville for proof reading the final article).

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Saturday 7 October 2017

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Entry $5 for adults
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Presenters: Rod Bourke - DPI, Casey Cooper, Allan Thomas, Ray Hull, Norm Maher & others

Inside Sessions

9.00 - 9.15	Introduction and Welcome - Norm Maher and Ray Hull
9.15 - 9.45	Biosecurity Update and Code of Practice - Rod Bourke
9.45 - 10.15	Biosecurity for Beekeepers Course - Rod Bourke
10.15 - 10.45	A close look at American Foul Brood Disease, Chalkbrood, Small Hive Beetle and Wax Moth - Allan Thomas
10.45 - 11.15	**MORNING TEA**

Outside Session (Bring your own protective gear)

11.15 - 12.00	How to open a hive, Inspect for disease and reassemble the hive - Allan Thomas & Ray Hull
12.00 - 12.30	How to assess a queens performance, what to look for, laying patterns inside the hive - Casey Cooper & Ray Hull
12.30 - 1.30	**LUNCH BBQ** - Gold Coin Donation & Raffle Draw

Inside Sessions

1.30 - 3.00	A look at Queen Breeding - Casey Cooper, Ray Hull & Norm Maher The natural queen breeding process Artificial Insemination of unmated queens How to breeders select breeding stock queens and drones
3.00 - 3.30	Roundtable discussion and questions with Ray Hull & Norm Maher

Coffee and Head Home

Enquiries: Contact Ray Hull 0407 469 176
To confirm your attendance email Norm Maher: normmaher@hotmail.com

TRIBUTE TO NOEL BINGLEY

By Bill Winner

Having known Noel for 46 years, I can say with full confidence that what really mattered was that he was my friend and at times counsellor and on other occasions teacher.

Noel had one special gift that he gave willingly to many – his time! He was always willing to listen and give advice when it was sought.

Over the days following his passing I spoke to many within our industry who knew Noel, the one word that kept coming up was that he was a Gentleman.

He served his industry well and with dignity and honour.

Like so many leaders in this industry Noel recognised opportunities and the need to adapt and change. He quickly saw the merits of mechanical advancement not just with vehicles but also with extracting facilities. He had installed one of the first Pender GT 180 Horizontal extractors.

He and the late Sterling Kershaw recognised the value of Quality Assurance and both upgraded their food handling facilities to the very high standard that is maintained to this day. Both operations are B-QUAL accredited.

His understanding of bees and beekeeping meant he truly was a "Master Beekeeper" and in the tradition of such notable men he was quick to recognise change, the value of research, the need to stand up for his industry.

He served on the executive of the Commercial Apiarists Association of NSW in two stints, 1977 and again from 1984 to 1985 as that associations President. In that period he dealt with major issues such as the reforming of the CAA and was heavily involved in the Industries Assistance Commission Review of Biological Control of Echium Species. It was during those times that his bond with industry leaders such as Keith McIlvride and Linton Briggs came to the fore. He was bold, identifying his support against biological control, while recognising that his open stand could have had a seriously negative effect on the flourishing family business. But Noel; said it as it was, carefully and considered as always. Thankfully there were no hard feelings and the business continues to this day.

He and Barbara were regular attendees at the NSW state conferences along with interstate conferences. When he spoke you listened because his opinion was always worth listening too and always aimed at improving the lot of his fellow beekeepers.

He recognised true science diligently working along with his friend and colleague Dr Doug Somerville assisting Researcher John Rhodes in ground breaking research on queen bees, spending countless hours with Doug in the field working on the project. The resulting paper was applauded by honey producers and noted worldwide for the quality of the research. Doug recounted that the extensive periods of time spent with Noel, were amongst the fondest memories that he has of his over 30 years of being involved in the beekeeping industry.

When it came to talking about bees, time did not weary Noel. He was quite ill a short time ago and his son; Neil called me and asked me to give his Dad a call to brighten him up. Great! How do you do that over the phone? It only took about 3 minutes and we were into a discussion about a simple board that the family had used for 30 years when raising queen bees. About an hour later I had a great piece for the Capilano Newsletter on "The Bingley Board". I'm not sure if I brightened Noel's day, although I can report, as always he brightened mine! That was one of many articles in the company Newsletter that never named Noel but he was the ever reliable source.

Noel was a fine honey blender, with my role at Capilano expanding through the 1990's Noel would often in our regular phone calls give me hints on blending and which honeys went together to produce good blends. All invaluable advice. In time I have put what I learned into practice even when judging honey at such honey shows as the Sydney Royal's, National Honey Show. Though Barbara would tell you I placed strain on the friendship when for two years in a row I did not award first prize to their famous creamed honey. I made up for it last year when it again picked up a first. Relationship restored!

Here we have focused on Noel and the beekeeping community, but in life he has been blessed with a wonderful family supporting him at all times and Noel supporting them. In life's journey we rarely come across such a complete unit bonded by the patriarch.

He stands shoulder to shoulder with what would be in sporting terms the immortals, the likes of QLD's acclaimed researcher Graham Kleinschmidt, FCAAA stalwart Linton Briggs, NSW industry greats such as Alan Clemson, Keith McIlvride, Neil Peadon, Sterling Kershaw and South Australian Rex Deer, perhaps it is best to leave the list there.

At a person's death kind words are offered. Indeed all of us merit praise for our life's achievements and the contributions as individuals that we make but some stand out that little bit more and will long be remembered by those that knew them.

Noel was not an industry giant! He was a colossus! May he rest in peace. A grateful industry extends its deepest sympathy to his loving wife Barbara and family, long will he linger in our memories.

VALE
NOEL BINGLEY

19 July 1932 – 19 July 2017

Noel was a huge and integral part in the lives of those that knew and loved him. His contributions in life extended beyond that of his family, sharing his experience and knowledge with all whom he encountered.

Noel was the eldest of two sons. He was born on the 19 July 1932 to Herbert and Clarice Bingley. Noel was born at Auburn private hospital in Queanbeyan then brought home to the farm at Sutton, now known as "Weerona" where he lived and worked his entire life.

As a young boy he attended Sutton Public school, where he would have most probably been under the strict tutelage of Mr Richard Byrne, and Mr Hobson. He would have learnt book binding amongst Math and English lessons, as well as training hard for sporting events. He was remembered as a tall strapping young lad, quiet but happy and friendly to all. Noel was lucky enough to have a push bike which he rode from the family farm to Sutton school each day. He was apparently very proficient at trapping rabbits to make ends meet during these early years.

Noel then completed his schooling through correspondence and eventually became a builder. As with everything he took pride in producing a quality finish and was well respected in the trade at that time. Noel was involved in the building of numerous woolsheds and granaries on local farms and properties including the granary at the old Tuggeranong Homestead and of course the local Sutton Village Hall. He was still working the farm together with his father and brother, as Herbert Bingley and Sons.

Noel was 18years old when a friend showed him a hive of bees in a tree… And there began his fascination, love and passion for beekeeping which just simply never faded. For the next few years he would build up his hive numbers by removing nests from trees whenever he could, around his building work.

Many of you may not be aware that both Noel and Barbara were talented Ballroom dancers and tutors. They actually met when Barbara was 17 years old and Noel was asked to be her debut partner when they were both teaching dance at the Mal Strahan dance Studios in Canberra. … they must have seen something they really liked in each other as they have been together ever since. They dated for 12 months, were engaged and then married on 5 December 1959. Both continued dancing until the 1960's when time for family and work took precedence. Noel was still then a builder by trade and helping to run the property but did keep a few beehives as a hobby. Noel and Barbara have 4 children, 10 grandchildren and 1 great grandchild. They have been married nearly 58 years. Noel always said that he had 3 great loves in his life….

Bees,, Apple Pie. And Barbara!! She always came in third!!

By 1961-62 Noel had built his hive numbers up to 250 and had to make the decision to choose between building and beekeeping… clearly beekeeping won out and his love of beekeeping stayed with him to the very end. Noel was involved in all facets of the beekeeping industry and the positive impact that he made. He was always keen to promote honey awareness to the general public and did so by exhibiting at the Sydney show, where he and Barbara won numerous awards. The highlight of all his hard work was in 2012 when Noel and Barbara won the John Ross award and the following year when they received a sash and badges in recognition of them being an exhibitor for 35 continual years at the Royal Easter Show.

The early years of beekeeping were physically tough and this did take its toll on Noel's body and health although he always remained deeply interested in all aspects of the operation. When he could no longer work in the field he became the operations "chief maintenance man". His highlight was the regular 'daily updates' when his sons were away.

During this latter part of his life he also enjoyed spending evenings at the club with Barbara, attending bee conferences, meetings, socialising and traveling with their apiarist friends--- in fact he enjoyed most things so long as it involved **BEES**. As with most beekeepers, he loved nothing more than talking to other beekeepers about bees, and as typical with **ALL** beekeepers he always drove his vehicle with one eye on the road and one eye searching for buds in the trees.

Noel started and headed what is one of the most successful beekeeping operations in the southern NSW… Two of his sons joined the operation in the 1980's and are continuing his legacy today.

Noel lived a life that was full. He accomplished a lot and the words that we have here hardly do him justice. It is impossible to put your life and all that you meant to us in just a few lines.

Noel was witty, funny and smart. He was respected by many, was loved by many and will be missed by many.

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Queen Rearing Equipment
Honey Sumps & Filters
Pollen Dryers
and much, much more....

BEE BRAIN FORMULA FOR SEEING COLOURS MORE EFFECTIVELY COULD BE USED IN DRONES, ROBOTS

By David Sparkes
5 Jul 2017

Scientists investigating how bees see colours say the insect's highly efficient visual system could revolutionise the way robots and drones view the world.

The way humans see colour is heavily affected by the changing light around them, such as during a sunset or in the middle of the night, but bees see the same colour regardless.

The Melbourne-based team has studied how bees solve this problem, by using three special eyes on top of their head, in addition to two main eyes at the front.

"The three eyes point skyward and they directly sample the colour of the light above us," Dr Adrian Dyer of RMIT University said. "If it's a sunny day or a cloudy day, [those three eyes] can detect that.

“It means their brain knows what kind of lighting conditions they are in and then, when they are looking directly at a flower, they can say, 'Ah, it's a blue sky day, so the correct colour should appear like this, or if it's a cloudy day it should appear like something else”.

This ability is vital to bees, as it allows them to find the best flowers to collect food to take back to their hive.

The team discovered that the three eyes on top of the bee's head, called ocelli, contain two colour receptors that are perfectly tuned for sensing the colour of ambient light.

The information from the ocelli is integrated with the colours seen by the two front eyes.

To prove this was happening, the researchers mapped "neural tracings" sent from the ocelli, showing they feed into the areas of the bee's brain that processes colours.

The project was completed by a joint team from RMIT University, Monash University, University of Melbourne and Deakin University and their findings will be published today in the scientific journal, Proceedings of the National Academy of Sciences of the United States of America.

TECHNOLOGY TO COPY THE BEES

Just as humans cannot see colours reliably, because the light around us changes, cameras, robots and drones have the same problem.

Dr Dyer said this long-running conundrum has held back the advance of technology to perform a range of tasks.

"This is a very big problem for machine vision — how to make reliable decisions when the colour of the light changes," he said.

"So our study looked at how bees solve the problem."

The team discovered the mathematical principals used within a bee's brain to process data collected by the three top eyes about the surrounding light and make an adjustment for what the two main eyes are seeing in front of the bee.

The mathematical formula can be easily programmed into a computer.

One example of how the technology could be used is in horticulture. Drones could fly around an orchard, possibly at night, and accurately detect the colour of different fruits to determine whether they are ready for picking.

The manager can then make accurate decisions about how to deploy his workforce.

This more accurate ability to analyse colour could also be used by drones to inspect infrastructure, such as bridges, or to analyse mineral sands.

"These ideas have been around for a while, but the problem has been how to judge colour accurately," Dr Dyer said.

The project was supported by a grant from the Australian Research Council.

NOTIFYING BEE PESTS & DISEASES IN NSW

There has been some confusion about notifying bee pests and diseases under the new Act.

Please widely distribute this link:

https://biosecurity.transactcentral.com/Biosecurity/servlet/SmartForm.html?formCode=biosecurityrisk

This is the link through which you can notify.

It is a legal requirement to notify Nosema, Chalkbrood, Small Hive Beetle, AFB and EFB within 24 hours.

If you suspect an exotic pest or disease (e.g. Varroa, tracheal mites, Asian bees), do not use this form. Rather call **1800 084 881** immediately.

This requirement remains in place to support international market access for beekeepers.

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THE FROST REPORT

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Finalist for 2017 NSW Trainee of the Year: Travis Mills

It gives me great pleasure to announce that Travis Mills, of North Star, has been awarded Finalist for Trainee of the Year and Achievement in Agriculture at the 2017 NSW Training Awards held on 23 June 2017 for the New England Region.

Travis, having had his own bee hives for several years, decided while still a student at Warialda High School, to pursue workplace experience with a commercial beekeeper. After two weeks of work placement with Steve Webber from Ruby Creek Farm in Bingara, Travis decided beekeeping was a career worth pursuing. Martin Bower, Warialda High School Career Advisor, suggested the next step was a traineeship with Ruby Creek Farm.

Travis Mills at a Tocal College Queen Bee Breeding Course in Bingara with employer Steve Webber in the background

Employers Steve and Suzanne Webber took the initiative with new beekeeping industry entrant Travis and together filled out a Training Plan Proposal with their local Apprenticeship Centre which identified Tocal College as the only Registered Training Organisation (RTO #91166) in NSW delivering the Certificate III in Beekeeping as a Beekeeper Traineeship. Tocal enrolled Travis in the 18 month-long Beekeeper Traineeship pathway to the Certificate III in Beekeeping Qualification (AHC32010) in March 2016.

In addition to the guidance of Warialda High School Career Advisor Martin Bower and Ruby Creek Farm employers Steve and Suzy Webber, Travis says, "The support of my family in this choice has been fundamental in my achievement and after completing 12 months of my traineeship I know that this is the industry that's right for me." Travis' parents Aleysa and Eric Mills own and operate an earth moving business in North Star.

Parents Aleysa and Eric Mills, son Travis Mills, employers Steve and Suzanne Webber at the New England Region 2017 NSW Training Awards

Steve Webber vouches for the young trainee saying, "Travis Mills is a fine employee and has proven his worth time and time again. The work of a beekeeper is hard and demanding both physically and mentally and Travis has stepped up at every possible opportunity and as far as we are concerned he is absolutely deserving of Trainee of the Year."

Regarding opportunities through the National Training System, Travis says, "I have found that being able to leave school and participate in the workforce in an industry that I am passionate about has been the best thing I could have done. As I am still participating in a learning environment that is focused on what my interests are I am achieving much better results than if I had stayed at school."

Beekeeper Trainee Travis Mills at the New England Region 2017 NSW Training Awards.

Upon completion of the Traineeship Travis hopes to continue working his own bees and building a business. Travis has been a great student at the Queen Bee Breeding, Artificial Insemination of Queen Bees, Using Bees for Pollination and Pests and Diseases of Honey Bees Courses he's attended.

The winner of the statewide Achievement in Agriculture Trainee of the Year award will be announced by the NSW Department of Industry in September 2017. If I had a vote, it'd go to the beekeeper.

Interested in the Beekeeper Traineeship? Contact Elizabeth Frost at the email or phone numbers listed above.

A MAKE IT YOURSELF HIVE LOADER

By: Jerry Bromenshenk - 21 October 2016

Large scale beekeepers often place hives on pallets and move them using forklifts and flatbed trucks.

Small scale beekeepers are more likely to have a pickup truck or trailer. The problem is loading and unloading hives, especially if one is working alone.

A bed-mounted hoist is really handy but most are expensive. It's time to make a trip to a discount tool store like Harbor Freight (HF) or Northern Tool. I've got a nearby Harbor Freight store. A hydraulic-jack ½ ton hoist with a hand-crank winch costs $89 for a short crane and $149 for a taller crane. For another $89, you can toss the hand-winch and replace it with an electric ATV winch with a wireless remote control. Now you can operate the winch while steadying the hive.

Crane down

If you don't mind bolting everything into the bed of the truck or trailer, you're ready to go. Just be sure to add a reinforcing plate to the truck bed, the thin bed sheet metal won't take the strain. If your truck has a trailer hitch, spend another $18 for a 12" receiver hitch extender. Weld the base plate of the hoist to the extension, and you've got a crane that can be easily mounted and dismounted. If you or a friend can weld, that's a total of $256 for the taller lift. Cost will be a bit more if you need to pay someone to attach the base onto the extension.

This works very well, but the downside is that since the crane is in the middle of the truck. You will have to either remove the tailgate or lift the hives up and over the sides of the truck. A better solution is to move the hoist to the side of the truck so that the tailgate can be opened. You can find this type of crane on the web in aluminum or steel for around $1500 plus shipping – ouch!

Not to worry, a chunk of square tubing welded into a T solves the problem. The hoist base needs support for heavy lifting, so you should add an adjustable foot. My design allows me to mount the crane on either side of any pickup with a trailer hitch. Basically, I had a T-shaped extension built, then added a longer, horizontal, square pipe that can be slid left or right to fit the truck, and a foot that slides up and down inside the vertical mast for the crane.

The t-shaped extension plus the horizontal pipe

This part takes the most fabrication work. You need to drill a hole through the center of the crane base and weld on a piece of square tubing to receive the leg of the foot plate. None of the dimensions are critical, just fit to the base of the crane that you purchase and use the right-sized extension for the hitch on your truck. If you want to be able to adjust the left or right length or the height of the foot for uneven terrain, you'll need to drill some holes – how many is up to you. Given that you are drilling two layers of rather thick-walled square tubing; I highly recommend a drill press.

Adjustable foot

The version of this crane that I use on my own truck has one more feature. I added a direct-wired controller to the electric winch. The wireless fob is easily to drop and lose in the grass, the battery may die, and there's a bit of lag between pressing an up or down button and winch response. The crane-mounted controller is more precise, can't be lost, and runs off the battery.

A few tips – the HF hand-crank winch has soft teeth and the cable may jam when spooling. If you use the HF winch, take up cable slack without any load, then use the jack to lift the load. If you lift the weight of a heavy hive by cranking the winch, it will self-destruct in a season or two. Leave the hydraulic jack in the down-position when not using. The jack shaft is prone to rusting if exposed to weather. Hook a loop of string through the keyhole in the remote control for the winch and hook to your belt or wear around your neck (just be sure that the string will break before it chokes you, if you hook it on something). HF's crane has a loop for the jack handle pipe at the base of the crane.

I worry about bouncing the jack handle out on rough roads, or someone using it to smash a window to steal things from the cab or maybe even the truck. I carry the steel jack handle under a seat and have a light-weight handle that I leave in the base of the crane. I made it from a piece of PVC pipe with a wooden towel glued inside to take the flex out of the PVC. Light, cheap to replace, and it's likely to take a lot of work to break a window with a PVC pipe.

The crane swivels, just remember to lock it down when driving or you may lose the rear window as the boom swings inward. Also, collapse the boom to its shortest length so it can't reach the window.

There's a locking pin for the crane swivel near the top of the mast. I replaced the HF clip with a bolt and a large thumb nut, painted red so I can easily find it. There's also a grease-fitting near the top of the mast. Keep the mast well lubed; do so frequently or the mast will be hard to turn with a load on the crane. Don't forget to raise the support foot before driving off! Otherwise you'll dig a trench in the dirt or hear a scraping sound. Worst case, you hook a stump or curb and tear the whole thing off.

The one change I'd make if I did this over would be to bend up the front of the support foot so it would act more like a sled, and I'd round the corners of the crane base – it'd be easier on the shins. Finally, the whole thing bounces and rattles if left loose. Before driving, I attach the crane hook to a bed tie-down, then tighten the crane until the cable pulls tight and starts to lift the whole assembly. That lifts the support foot even higher off the ground, and it keeps the crane assembly secure and stable with little or no rattles.

Adjustable foot

As per lifting hives, I have ratchet-straps on all of my research hives. We slide the web strap through a D-ring, ratchet the strap tight, and attach the cable hook to the D-ring. That's the cheapest and simplest solution. There are lots of slings for lifting hives that you can build or buy. Most either have a cradle the slips under the base of a hive or have clamping arms that use the handholds of a hive body. However, that's added expense and one more thing to carry.

Jerry Bromenshenk is a Class Development Leader at the University of Montana's, Master Beekeeper Programs and retired Researcher in the Entomology Department there. He is a frequent contributor to Bee Culture.

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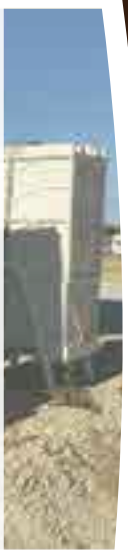

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BEE BIOSECURITY OFFICER REPORT - JULY 2017

Rod Bourke - NSW Bee Biosecurity Officer
NSW Department of Primary Industries - Biosecurity NSW
Tocal Ag College, Tocal Rd Paterson NSW 2320
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As we moved past 30 June and into a new financial year most of you have probably been happy to see that your bees are becoming a bit more active as they start getting their queens back into gear, as they have noted the days are getting slightly longer (but maybe not warmer yet!). Another important event that's occurred is as of 1 July 2017, NSW has introduced new regulations to govern beekeeping within the state.

There are quite a number of changes and DPI will be providing information about these in the coming months. These changes have been introduced to support protecting the biosecurity of NSW honey bee industry and to promote safe beekeeping practices across the state.

The main point that I will be discussing is the Australian Honey Bee Industry Code of Practice (the Code), which has been developed at a National level by the Australian Honey Bee Industry Council (AHBIC-the peak body for beekeepers in Australia), Plant Health Australia (PHA-whom oversees the National Biosecurity response for plant industries, including for honey bees) and all state Beekeeping bodies through many years of consultation. From 1July the Code has become a very important document for NSW beekeepers to think about, as it represents the basic standard for beekeeping biosecurity and should be adopted by all beekeepers.

The Code has been developed to address a number of long term issues faced by the industry to assist with raising the overall standard of Biosecurity within Beekeeping in Australia. A lot of this comes back to the fact that "biosecurity is a shared responsibility", meaning that in order to reduce the biosecurity threat all beekeepers need to ensure that they are not actually part of the biosecurity PROBLEM!

My role, which is funded through the compulsory honey levy paid by commercial beekeepers, is to raise the level of awareness of the Code and to assist beekeepers in becoming compliant with it.

A basic breakdown of the code;

1. Beekeepers MUST be registered
2. Beekeepers MUST report Notifiable Diseases
3. Hives MUST be regularly inspected for significant pests & diseases
4. Beekeepers MUST control or eradicate pests & diseases & MUST manage weak hives
5. Beekeepers MUST maintain records of biosecurity-related actions & observations.
6. Hives MUST be appropriately constructed & branded
7. Beekeepers MUST NOT allow hives or appliances to become exposed or neglected
8. Beekeepers MUST allow their operation to be assessed.

Additional requirements for Beekeepers who manage 50 or more hives;

9. Beekeepers MUST demonstrate a minimum level of knowledge of pests and disease identification and management
10. Beekeepers MUST have honey tested annually for American foulbrood
11. Additional information must be provided annually.

Further to this the Code recommends that all beekeepers should;

12. Identify their Apiary Sites
13. Maintain a Barrier System of Hive Management.

Some helpful links are as follows;

http://beeaware.org.au/code-of-practice/
http://beeaware.org.au/code-of-practice/record-keeping/
http://www.planthealthaustralia.com.au/industries/honey-bees/
http://www.planthealthaustralia.com.au/wp-content/uploads/2012/12/Honey-Bee-biosecurity-sign.pdf

As you can see a lot of these conditions are nothing new and are already being routinely practiced by most beekeepers around Australia. Many other Agriculture & Aquaculture industries have operated successfully under far greater compliance requirements for decades, so once everything is put into perspective you can see that the Code is quite fair, somewhat flexible and not overly onerous to abide by.

Unfortunately there are some beekeepers out there that are not following the basic conditions set out in the code (including even being registered!), and generally they are having a negative impact on the vast majority of other responsible beekeepers whom are doing everything right. These "uncompliant" operators will need to put in some extra work so that their operations reach the minimum standards required, or they will probably find it increasingly hard to stay within the industry. If you want to keep bees you should understand that there are certain requirements and obligations that you need to abide by (just like keeping dangerous dogs or driving a car, truck or forklift etc.), and if you cannot meet those standards then perhaps you should not be doing it! I aim to assist these beekeepers to reach this standard, if they want to do so.

There are some requirements that will mean more work for some beekeepers, but not surprisingly a lot of Australia's successful beekeepers already do that amount of work and more on their hive management. When you consider that there are commercial beekeepers out there that routinely average 200-300kg+ honey per hive/season it is

not rocket science to suspect that they probably manage their hives very intensively and have no room for weak/ underperforming/diseased hives within their operation. They also move their hives frequently to the next honey flow/pollen source, but there is no room on their truck for non-performing hives so they work hard to minimize the incidence of "dead-wood" within their operation. For them it is better to invest time in prevention of the problem than in a cure for it later on, as that is going to become a major disruption to their business and cause economic losses.

Whilst Amateur beekeepers do not rely on their bee hives providing them with an income to the same extent that commercial beekeepers do they will still find that allocating extra time for routine brood inspections and management saves them a lot of time and potentially grief in the long run. In all situations for both Commercial and Amateur Beekeepers it comes down to how much time you can afford to allocate to managing each individual hive…if you don't have enough time to work each hive thoroughly then ask yourself if perhaps you may have too many hives? At some point the ratio of hives to beekeeper becomes unbalanced and there are simply not enough hours in the day to manage them all effectively…many have downsized operations to better suit their situations, and often been very pleased with the end result as their apiaries are consistently better performers than before.

The main key performance indicators of a strong hive during the honey season are;

- Lots of frames of capped & uncapped brood
- Lots of bees
- Lots of pollen coming in
- Hopefully lots of nectar coming in too….

Beekeepers will not be able to achieve these standards if their bees are suffering disease or other negative impacts, and they won't even necessarily know if the bees are underperforming unless they actually get under the excluder & look at their brood. The excluder is only a barrier to stop the queen (hopefully) from getting up into the honey box…it SHOULD NOT be a barrier to stop the beekeeper getting down into the brood box, so get it off regularly and see what is going on down there!

In talks with a number of successful commercial beekeepers in NSW it is clear to see that brood inspections are a normal part of their seasonal beekeeping and can occur quite frequently. Every spring there is AT LEAST one full brood inspection where EVERY FRAME in the brood box has the bees shaken off and the frame THOROUGHLY INSPECTED. At this time older frames are often removed (burned or irradiated) and new clean comb/wax foundation added. The queen is often assessed at this time and splits can be taken if needed. It is not uncommon that just one cell of AFB is found in a hive (during a thorough brood inspection) and as a result that hive is removed from the operation. They clearly understand and accept that one cell of AFB is ONE CELL too many & that hive has to be quickly removed, as if left there it will become a far bigger problem and may cause infection to other hives!

With swarm management during spring there will often be further brood frame inspection to find/remove queen cells (generally best to shake off excess bees when doing this as sometimes the bees hide small queen cells in drone comb or holes at the edges of frames), taking splits and investigating why hives are not performing to standard.

Some hives may get 4-6 brood inspections before Christmas and generally all hives get at least 1-2 more inspections before being closed down for winter. Not all of these inspections require every frame to be looked at & all bees to be shaken off, but if hives are not doing

very well then they should get this full brood inspection treatment so that you have all information available to you when deciding how to get the hive pumping again (or if it should be removed from service!). As long as you keep good records of your hive work, brood inspections & migratory travels you will be fulfilling one of the very important parts of the Code.

These records may be vital for investigating/managing/eradicating disease/pest outbreaks, so do not underestimate how vitally important it is to clearly record what you are doing. This may be one of the most challenging parts of the Code for some beekeepers to fulfil, but it should be looked at as a priority area to master if you have not yet done so.

At the end of the day the take-home message regarding the Code is pretty simple and honest…If you manage your bees to a high standard then you will have better and more consistent hives and reap better honey crops. You may need to put in a little bit more work/effort to achieve the minimum standards as set out in the Code, but in the new world that we live in it is expected by your peers that you will undertake that effort and achieve that level of responsibility, otherwise you are not undertaking your "Duty of care" to those others around you. If you neglect this responsibility you may unfairly impact or severely damage the businesses of other nearby beekeepers, do harm to the industry and also the community. It is very popular these days that somebody needs to be blamed for another's problems, so try to not let it be you!

In order to be fully compliant and following the Code you may be required to change some of your old practices (not necessarily a bad thing to do!) and the workload from undertaking brood inspection and record keeping may increase, but this is also generally a positive move as these actions can help to improve your economic/profit outcomes anyway. There is nothing bad in the Code, especially if you are already doing everything to the correct standard. If you are not yet at the standard then maybe it is time that you went that way anyway, so I hope your journey is a productive one.

BOLT course & change of details
For those NSW registered commercial beekeepers (with 50 hives or more) whom would like to do the Biosecurity for Beekeepers BOLT online course & have not yet received a token from me (to do it at no cost) please send me an e-mail to rod.bourke@dpi.nsw.gov.au listing your brand, individual or company name & I will get this out to you.

For all beekeepers use the following link to access the course. https://honeybee.canopihr.com.au

There are also many beekeepers on the DPI registered beekeeper database that have no listed e-mail address (or even mobile/landline numbers), so if you would like to receive your token for the BOLT course (plus other important industry news) please update all of your details using the following link & then send me an e-mail when you have. Don't forget to also update your beehive numbers when you re-register every 2 years, plus whenever you sell/dispose of any beehives.

http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/392447/Change-of-Beekeeper-Details-Form.pdf

OBITUARY
GRANT HENRY LOCKWOOD
21 May 1958 - 5 June 2017

Grant was born in Sydney and moved to Orange with his family in 1966.

Grant attended East Orange Public School and then Canobolas High School. He was always an outdoor kid enjoying and exploring the bush not only on his own but also family holidays where always spent camping.

In 1974 at age 16 Grant got himself a job at Orange Bee Farms with Murray Charlton, Eddie Podmore and Kevin Bowyer. Grant was a natural learning about bees and the bush. Beekeeping took him from far western Queensland to the south coast of New South Wales and anywhere in between, camping under the stars.

The 1980's saw Grant leave Orange Bee Farms buying his own beehives and gradually building his own business. Grant was now married with a young family so to value add you often found Grant at a market selling the honey he had proudly produced and packed. He also had small pollination contracts with local orchardists.

During the 90's Grant got a job for a couple of years managing an export company where he learnt how to export live bees to Korea. His hive numbers now substantial, factory built Grant secured honey packing contracts, bred queen bees for domestic and export markets and of course exported package bees. His love of travel found him networking and selling bees and honey all around the world. Grant traded and visited countries such as Korea, Malaysia, Canada, United States, France, United Kingdom, United Arab Emirates, Japan and China just to name a few.

The year 2000 Grant formed the family company and traded as Goldfields Honey Bee and Pollination Services Pty Ltd. Jon his eldest son (his right-hand man) started working beside his father and Grant taught him his skills.

Goldfields now secured almond contracts, exported live bees from Western Australia, every year saw a new expansion to the business now becoming one of the biggest beekeepers in the industry. Grants love of Australian history saw him buy an old Cobb and Co building midway between Bathurst and Orange now known as The Beekeepers Inn. This is now a bustling tourist facility promoting and educating both locals and tourists his love of bees, honey, farming and the Australian bush.

During the past seven years Grant has built a new and modern factory which has global accreditation. This is where honey is extracted, where honey is packed for major distributors & supermarkets, where beehives are built and maintained and where you can find the odd beekeeper that has just called in for a chat and often some advice.

During the last couple of years Grant had started to take things a bit easier enjoying his hobbies, traveling and antique collecting and dealing.

None of this was achieved without his loyal staff. They are from all parts of the world and all section of the community. Not only has he helped train beekeepers he has created a business that has trained chefs, hospitality staff, administration, processing workers and from time to time employed with those that are disadvantaged. Grant was a quiet achiever and was always promoting his industry behind the scenes and often a mentor to many.

Grants greatest pride is his family who all work in the business. Grant is survived by his son Jon (beekeeper and his right-hand man) his son Mark (chef, brewer and café manager) his daughter Claire (Café, tourism and event manager) and youngest son Sam (honey packer, factory manager and beehive manufacturer) and of course his wife Vicki (administrator). Grant also has three beautiful grandsons Billy, Max and Winston.

Grants favourite saying "Haven't had a day off since 1977.

Sadly, Grant passed away on the 5 June 2017 after a short battle with cancer.

Grant Lockwood "gone to the big beehive in the sky"

VIABILITY OF ROYAL JELLY PRODUCTION INDUSTRY IN AUSTRALIA ASSESSED

RIRDC Industry Case Study

New technology developed in China has been trialled by Australian researchers in an effort to uncover the potential for a royal jelly production industry in Australia.

Royal jelly is a popular ingredient in cosmetics, as well as health supplements, and has a wholesale international market value of $US135 million per annum.

To date, commercial royal jelly production in Australia has been limited due to the labour intensive process to hand graft larvae and manually extract the product.

The study, Australian Royal Jelly: Market Opportunity Assessment based on production that uses new labour saving technology, funded by the Honey Bee and Pollination Program, looked to identify the size of the potential market for royal jelly produced locally.

Chair of the Program's Advisory Panel, Michael Hornitzky, said Chinese technology that reduces the labour required to produce the high value product was brought to Australia and reviewed by a Victorian beekeeper as part of the research.

"A number of Australian beekeepers have expressed interest in royal jelly production and this study provided an important insight in to not just the market interest, but also to what extent the economics of production change with this technology being available," Dr Hornitzky said.

The technology is based on a modified hand operated centrifugal honey extractor and simplifies the process significantly, to just under one and a half hours of beekeeper time necessary per hive, per production cycle.

"There is a huge market for royal jelly and it's something that could value add to a high integrity industry here and while the study showed that the breakeven cost of supply is substantially less when the Chinese technology is utilised, the production costs are more than the retail price of imported alternatives," Dr Hornitzky said.

The study's authors, Michael Clarke of AgEconPlus and Peter McDonald of McDonald Honey, found that the indicative breakeven costs would be approximately $520/kg, compared to the Australian retail price for royal jelly made in China, at just under $300/kg.

The study recommends further investigations in to other innovations that may work in favour of a lower production cost for Australia royal jelly in the future.

Read the full report here: https://rirdc.infoservices.com.au/items/17-017

PUSH FOR SECURE POLLINATION TO BOOST FARM PRODUCTIVITY

RIRDC Media Release

Some of the most important questions and concerns currently facing pollination-dependent industries will be answered in an Australian first, multi-million dollar research project.

The 'Securing Pollination for More Productive Agriculture: Guidelines for effective pollinator management and stakeholder adoption' project is supported by funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit programme.

It will support collaboration between Australia's most knowledgeable bee and pollination researchers to assess the contribution of pollinators to nine Australian crops (apples pears, lucerne, almonds, canola, melons, blueberries, raspberries, mangoes), investigate re-establishing native vegetation to support pollinator food and nesting resources, and use new technologies to communicate the findings to farmers.

Four sub-projects will be carried out under the project, managed by the Rural Industries Research and Development Corporation (RIRDC), and co-funded and delivered by Australian National University, University of Adelaide, University of New England and University of Sydney.

The agricultural sector will be represented by project partners including Lucerne Australia, Apple and Pear Growers Australia SA, Almond Board of Australia, Australian Melon Association, Australian Mango Industry Association, and Raspberries and Blackberries Australia.

Paul Blackshaw is RIRDC's Project Manager. He says the outcomes of the four year project will offer multiple benefits to a wide range of sectors. "From securing productive agricultural environments, to improving vegetation, to future proofing against disease and pests like Varroa and boosting honey bee colonies, this project will help agricultural and horticultural producers to improve yields and rates of pollination," Mr Blackshaw said.

Initial research work has already begun including experiments to assess pollination deficits in apple orchards and pollinator habitats in the Adelaide Hills, as well as pollination field work with the blueberry and raspberry sectors in New South Wales.

Other partners to the project include Horticulture Innovation Australia, Primary Industries and Resources SA, Department of Environment Water and Natural Resources SA, Trees for Life, Greening Australia, Costa, Native Vegetation Council, Natural Resources Northern and Yorke (SA), SA Australian Apiarist Association, O'Connor NRM, Adelaide and Mount Lofty Ranges NRM Board and TERN Eco-informatics.

Media contact: Megan Woodward 0487 352 859

I VISITED A CSI CRIME LAB, BUT FOR BEES

By Lisa Cumming

I recently had a chance to visit the National Bee Diagnostic Centre (NBDC) in the small town of Beaverlodge, Alberta, which is basically an NCIS crime lab for bees. I was greeted by three scientists huddled around a computer screen speckled with green and red dots. They "hmm"ed and "ahhh"ed and occasionally tapped the screen with a finger or a pen. The red dots represented dead "swimmers" and the green were live ones: sperm samples from a queen bee. (The queen stores sperm from multiple worker drones).

Facing pressures like climate change and pesticide use, bees are in trouble in North America. The health of these pollinators is of upmost importance, so the NBDC is collecting health data on bees across Canada to help this country create a national bee health database. The project, called the National Honey Bee Health Survey, is funded in part by the Canadian government and researchers have been collecting samples for the last three years. The first phase is finishing this year, with the results coming out sometime next summer.

In late June, they released their findings from 2016. Among other findings, the survey showed that bees in New Brunswick, Nova Scotia and Prince Edward Island are suffering from a very high incidence of Chalkbrood—a fungal disease that infects the gut of the larvae. These three provinces have incidences above 31 per cent, while the national average is just below eight per cent. The other provinces all score below six per cent.

For the survey, honeybees are collected and analyzed for viruses, mite infestation, and hive infections, including Chalkbrood. (The report doesn't explain provincial discrepancies around the fungus.) Samples are shipped live to the NBDC, which began collecting bee samples in 2013, was the first facility in Canada solely dedicated to figuring out what's impacting bee health.

So far, said Christy Curran, the NBDC research project coordinator, only Canada Post has been willing to ship live bees. (This, despite the fact that FedEx has shipped entire live whales before.) Last year, samples from 314 different apiaries across Canada were collected.

The centre itself was created as a response to beekeepers wanting to know more about what's hurting their bees, so they also offer fee-for-service testing on honey bees to identify the bacteria, fungi, mites and viruses that might be afflicting them. For this, dead (and sometimes live) bees are sent in by everyone from hobbyists to professional beekeepers, across Canada and around the world.

Honey bees are important for Canadian agriculture. Pollination services provided by beekeepers add an estimated $3 to 5 billion in additional crop value. The NBDC is the result of a partnership between Grande Prairie Regional College and Agriculture and Agri-Food Canada, a federal agency.

I sat down with Curran and asked her what it's like to receive dead bees in the mail.

"Sometimes they smell," she laughed. (This can be attributed to the ethanol used to preserve them).

"Sometimes they're pretty gross," she continued, "but it's really neat and exciting the geography that we're covering, because Canada is quite big." The lab has received bees shipped all the way from the Yukon.
The recently released report includes findings based on samples collected from most Canadian provinces and territories, with the exception of Saskatchewan, the Northwest Territories and Nunavut. Previous years' surveys only included samples collected in two to four provinces, so it is getting more comprehensive.

"The beekeeping industry has been suffering a large amount of losses during the winter months," said manager Carlos Castillo, a scientist. "Probably starting somewhere around 2006 or 2007, many beekeepers wanted a diagnostic centre to understand what's going on."

Pesticide use is a growing worry, he said. "In general, [beekeepers] are concerned about pesticide use, because beekeeping is very closely related to agriculture." According to him, farmers are supposed to contact beekeepers when they're going to use pesticides, so that the beekeeper can contain the colonies and keep them out of those areas for a few days.

"Unfortunately, sometimes there is a miscommunication and hives die," he said.

Canadians are taking notice of the health of their bees: Health Canada has proposed a broad-sweeping ban on uses of a neonicotinoid pesticide called imidacloprid after it was found that it is seeping into the waterways and harming bees. And this country has six designated "bee cities," including Toronto.

The NBDC is putting in the work to ensure that beekeepers know exactly what they're up against when their hives take a turn, but it's up to the beekeepers to use their findings and protect the hives.

Courtesy: Bee Culture

NSW Local Land Services

NOTIFICATION:

Local land Services will continue its service of providing Apiary permits to registered bee keepers in NSW. Whilst there is a new policy framework under development, the interim arrangement remains in place.

Permit renewals or vacant sites will be available on an interim permit for a period of 12 months with an interim annual permit fee of $145 plus GST.
The existing terms and conditions will apply.

Should you have any further inquiries please contact your local Local Land Services office to discuss further on 1300 795 299.

Yours sincerely

Ray Willis
Project Manager, Biosecurity Subordinate Legislation Reform
Local Land Services

EMPLOYERS WANTED

The NSW Agrifood Industry Training Advisory Body was successful in obtaining the CIII in Beekeeping on the NSW Government Smart and Skilled list. As a result of this, the qualification is now heavily subsidised for industry and is also now available as a school based traineeship (SBT) free of charge.

This is the first time that the qualification is available to high school students in NSW and potentially Australia. This will allow high school students to do the CIII in Beekeeping as part of their Higher School Certificate as well as work as a beekeeper while at school.

A school based traineeship pilot will commence in the latter half of the year on the north coast of NSW to allow keen high school students to take advantage of the newly available traineeship.

Representatives from the NSW Department of Education are currently working with high schools in the northern rivers and mid north coast to recruit interested participants. They have reported that there has been great interest in participating in this trail from school students.

A traineeship is an employment arrangement between the student/trainee and the beekeeper. Beekeeping employers are wanted to take advantage of this exciting new trial and employ student/trainees for a minimum of 120 days over approximately 2.5 year period.

The 120 days allow student to develop practical skills with on the job training from the employer which is essential to becoming a successful commercial beekeeper in the future.

The advantage of SBT's for employers are:

1. a keen source of labour who are interested in learning about beekeeping
2. NSW Department of Education will cover the cost of the training delivery and assessment.
3. training will be provided by a Registered Training Organisation (RTO) who is highly experience and respected industry trainers. These trainers will deliver the formal training and assessment
4. training will provided across 16 competencies including four elective competencies for a nationally recognised qualification
5. lower wages for the trainee while they are training and working for you
6. this will allow commercial beekeepers and queen breeders the opportunity to have skilled trained labour available for the future of the industry and food security.
7. ideal for beekeepers with sons or daughters at high school who are interested in entering the family business while at high school.

For this pilot to be successful, it is essential that commercial beekeepers support the initiative and employ a trainee. Beekeepers are required to employ a student for a minimum of 120 days. Wage rates are according to theNational Pastoral Award for school based trainees.

Bruce White a beekeeper from Sydney believes that this is a great opportunity said "it would have been great for current commercial beekeepers to have had this opportunity while they were at school."

Two showcase days for students, teachers, careers advisors and employers are planned the far north coast and mid north coast in October 2017.

For more information please contact Melissa Wortman at the NSW Agrifood ITAB on 0421 830 056 or melissa@nswagrifooditab.com.au or Bruce White on (02)9634 6792 or bruceandlynn@outlook.com.

PUBLIC EXHIBITION OF MORTON STATE CONSERVATION AREA DRAFT PLAN MANAGEMENT

The Morton State Conservation Area Draft Plan of Management has been prepared and is being exhibited in accordance with the National Parks and Wildlife Act 1974. The park is located approximately 17km west of Nowra on the NSW south coast, and is managed by NSW National Parks and Wildlife Service (NPWS), part of Office of Environment and Heritage.

The draft plan of management can be viewed at https://engage.environment.nsw.gov.au/consult. You are invited to make a written submission on the draft plan of management.

Submissions need to be received by 25 September 2017. You can provide your written submission in one of the following ways:

- use the online submission form at https://engage.environment.nsw.gov.au/consult
- email your submission to npws.parkplanning@environment.nsw.gov.au
- post your submission to NPWS Planner, Morton SCA, Draft PoM, NPWS PO Box 707 WEST NOWRA NSW 2541.

Your submission will be provided to a number of statutory advisory bodies (including the South Coast Regional Advisory Committee and the National Parks and Wildlife Advisory Council). Your comments on the draft plan may include 'personal information'. OEH complies with the NSW Privacy and Personal Information Protection Act 1998 which regulates the collection, storage, access, amendment, use and disclosure of personal information. See OEH privacy webpage: (www.environment.nsw.gov.au/help/privacy.htm) for details. Information that in some way identifies you may be gathered when you use our website or send us correspondence.

Your submission, in whole or part or as part of a summary, may be made publicly available on our website. If you do not want your submission made public in this way, please indicate this on your submission. If an application to access information under the Government Information (Public Access) Act 2009 requests access to your submission, your views about release will be sought if you have indicated that you object to your submission being made public.

Laura Babian, A/Team Leader, Park Management Planning National Parks and Wildlife Service - 0427 864 889

HUMAN ACTIVITY IS A KEY DRIVER IN THE SPREAD OF PATHOGENS AFFLICTING THE EUROPEAN HONEY BEE (APIS MELLIFERA) - Says Oz Researcher

Entomology Today - 12 June 2017

The Varroa destructor mite (shown above attached to bee) (Photo credit: Stephen Ausmus, USDA Agricultural Research Service, Bugwood.org).

In the search for answers to the complex health problems and colony losses experienced by honey bees in recent years, it may be time for professionals and hobbyists in the beekeeping industry to look in the mirror.

In a research essay published last week in the Journal of Economic Entomology, Robert Owen argues that human activity is a key driver in the spread of pathogens afflicting the European honey bee (Apis mellifera) and recommends a series of collective actions necessary to stem their spread. While some research seeks a "magic bullet" solution to honey bee maladies such as Colony Collapse Disorder, "many of the problems are caused by human action and can only be mitigated by changes in human behavior," Owen says.

Owen is author of The Australian Beekeeping Handbook, owner of a beekeeping supply company, and a PhD candidate at the Centre of Excellence for Biosecurity Risk Analysis at the University of Melbourne. In his essay in the Journal of Economic Entomology, he outlines an array of human-driven factors that have enabled the spread of honey bee pathogens:

Regular, large-scale and loosely regulated movement of bee colonies for commercial pollination

(For instance, in February 2016 alone, of the 2.66 million managed bee colonies in the United States, 1.8 million were transported to California for almond crop pollination.).

Carelessness in the application of integrated pest management principles leading to overuse of pesticides and antibiotics, resulting in increased resistance to them among honey bee parasites and pathogens such as the Varroa destructor mite and the American Foul Brood bacterium (Paenibacillus larvae).

The international trade in honey bees and honey bee products that has enabled the global spread of pathogens such as varroa destructor, tracheal mite (Acarapis woodi), Nosema cerana, Small Hive Beetle (Aethina tumida), and the fungal disease chalkbrood (Ascosphaera apis).

Lack of skill or dedication among hobbyist beekeepers to adequately inspect and manage colonies for disease

Owen offers several suggestions for changes in human behavior to improve honey bee health, including:

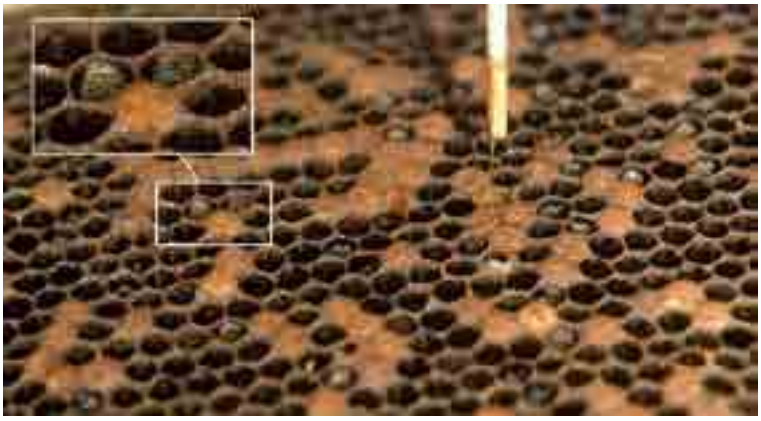
Stronger regulation both of global transport of honey bees and bee products and of migratory beekeeping practices within countries for commercial pollination.

Greater adherence to integrated pest management practices among both commercial and hobbyist beekeepers.

Increased education of beekeepers on pathogen management (perhaps requiring such education for registration as a beekeeper)

Deeper support networks for hobby beekeepers, aided by scientists, beekeeping associations, and government. "The problems facing honeybees today are complex and will not be easy to mitigate," says Owen. "The role of inappropriate human action in the spread of pathogens and the resulting high numbers of colony losses needs to be brought into the fore of management and policy decisions if we are to reduce colony losses to acceptable levels."

Could this be happening to your beehives?



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FOR THE LATEST NEWS GO TO THE AHBIC WEBSITE: **www.honeybee.org.au**

AHBIC UPDATE - June-July 2017

M418 CERTIFICATE, OTHERWISE KNOWN AS A 'DECLARATION OF IMPORTED GOODS'
There are changed conditions for exporters applying for an M418 Certificate, otherwise known as a 'Declaration of Imported Goods'. The notice can be found at the following web address: http://agriculture.gov.au/export/controlled-goods/non-prescribed-goods/industrynotices/2017/npg160617.

REVIEW AND UPDATE OF THE DEPARTMENT OF AGRICULTURE AND WATER RESOURCES CHARGING GUIDELINES
Two new Industry Advice Notices (IANs) have been published on the Department of Agriculture and Water Resources website:

1. Review and update of the Department of Agriculture and Water Resources Charging Guidelines
2. Non-prescribed goods Export Cost Recovery Charging Arrangement – Cessation of Remissions from 1 July 2017
The notices can be found at the following web address: http://www.agriculture.gov.au/export/controlled-goods/non-prescribed-goods/industry-notices/2017

NEW ZEALAND FUNDS FIGHT AGAINST MYRTLE RUST
New Zealand is funding work in the fight against myrtle rust. With myrtle rust affecting the Myrtaceae family manuka is one that has the potential to be affected along with some other honey producing plants. See http://www.scoop.co.nz/stories/SC1706/S00041/new-funding-takes-the-fight-to-myrtle-rust.htm

NATIONAL PLANT BIOSECURITY STATUS REPORT
The National Plant Biosecurity Status Report has just been published. See http://www.planthealthaustralia.com.au/national-programs/national-plant-biosecurity-status-report/. *Note the honeybee on the cover.*

SUSPECT SAMPLE IN SOUTHERN NSW
Some bees with K wing symptoms were found in southern New South Wales. Samples were taken and submitted for examination as K wing symptoms can be a sign of tracheal mites (*Acarapis woodi*). Examination showed no tracheal mites present and no viruses. There was Nosema present but this is not surprising for this time of the year. Thank you to the New South Wales Department of Primary Industries for their quick and decisive actions.

WARNING
It has been brought to my attention that canola may soon be sprayed for insects. I am told the chemical of choice in dimethoate. Dimethoate is very deadly to bees and has a reasonable residual time. So if you are on canola check to see if the famers are going to spray.

AHBIC AGM
The AHBIC AGM was held in Adelaide on 8 July 2017. The results of the elections were: Deputy Chairperson – Peter McDonald. As Peter was on the Executive and had a year to run on his appointment there now existed three (3) vacancies on the Executive. Those elected were: Leilani Leyland (2 years), Jodie Goldsworthy (2 years) and Phillip McHugh (1 year which is the remainder of Peter McDonald's term). The remainder of the Executive are Chairperson Lindsay Bourke, Executive member Ian Zadow, whose terms expire next year, and Executive Director Trevor Weatherhead.

Thanks to Craig Klingner, Casey Cooper and Neil Bingley for their service to the previous Executive.

There were many decisions made at the AGM. For more information contact your State AHBIC delegate.

CHANGE IN HONEY LEVY
One decision taken at the AGM was to ask Minister Joyce to re-arrange the current honey levy by increasing the NRS component to 0.3 cents per kilogram and reduce the EPPR component to 2.7 cents per kilogram. This is in line with motions agreed to at all the State conferences.A letter has been sent to Minister Joyce to ask him to put this in place.

THIRD AUSTRALIAN BEE CONGRESS
Planning is well underway for the Third Australian Bee Congress to be held on the Gold Coast from 27 to 30 June 2018. The website is http://australianbeecongress.com.au/. You can register on the website to receive updates as they come out. Please make sure you put this down in your diary for next year. We will have an exciting range of speakers on various subjects around the theme of the Congress "Pollination and beekeeping for the future".

STOP PRESS
The information on sponsorship packages and trade show sites for the 3rd Australian Bee Congress in June 2018 is now available.

If you have not yet received this information contact Therese Kershaw at tradeshow@australianbeecongress.com.au and she will send you out the information. Sponsorship and trade show sites are excellent ways to put your name out there and also show your wares to the beekeeping industry of Australia.

UPDATE ON TOWNSVILLE INCURSION
With the *National Response Plan for the Eradication of Varroa jacobsoni from Queensland* now in the 'proof of freedom' stage, the Queensland Department of Agriculture and Fisheries (QDAF) is continuing its strong focus on Asian honey bee (AHB - *Apis cerana*) surveillance in the Townsville City Council local government area, including destruction and testing of any AHB that are found for *V. jacobsoni*. QDAF are also continuing to work with industry to provide the necessary confidence that *V. jacobsoni* is not present in managed hives in the Townsville region.

AHB have not been detected in the Townsville region since November 2016, despite extensive surveillance and public promotion in the area. However, the search for any possible remaining colonies of *A. cerana* which could be harbouring *V. jacobsoni* remains a strong focus of the National Varroa Mite Eradication Program (NVMEP).
The NVMEP will be reviewing the current Response Plan in the near future as a result of the transition from the 'eradication phase' to the 'proof of freedom' phase and in response to any recommendations from the efficiency audit which is nearing finalisation.

For more information visit www.daf.qld.gov.au or to report suspicious bee activity please contact the QDAF Customer Service Centre on 13 25 23.

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THE AMATEUR BEEKEEPER

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Email: susancarney@me.com

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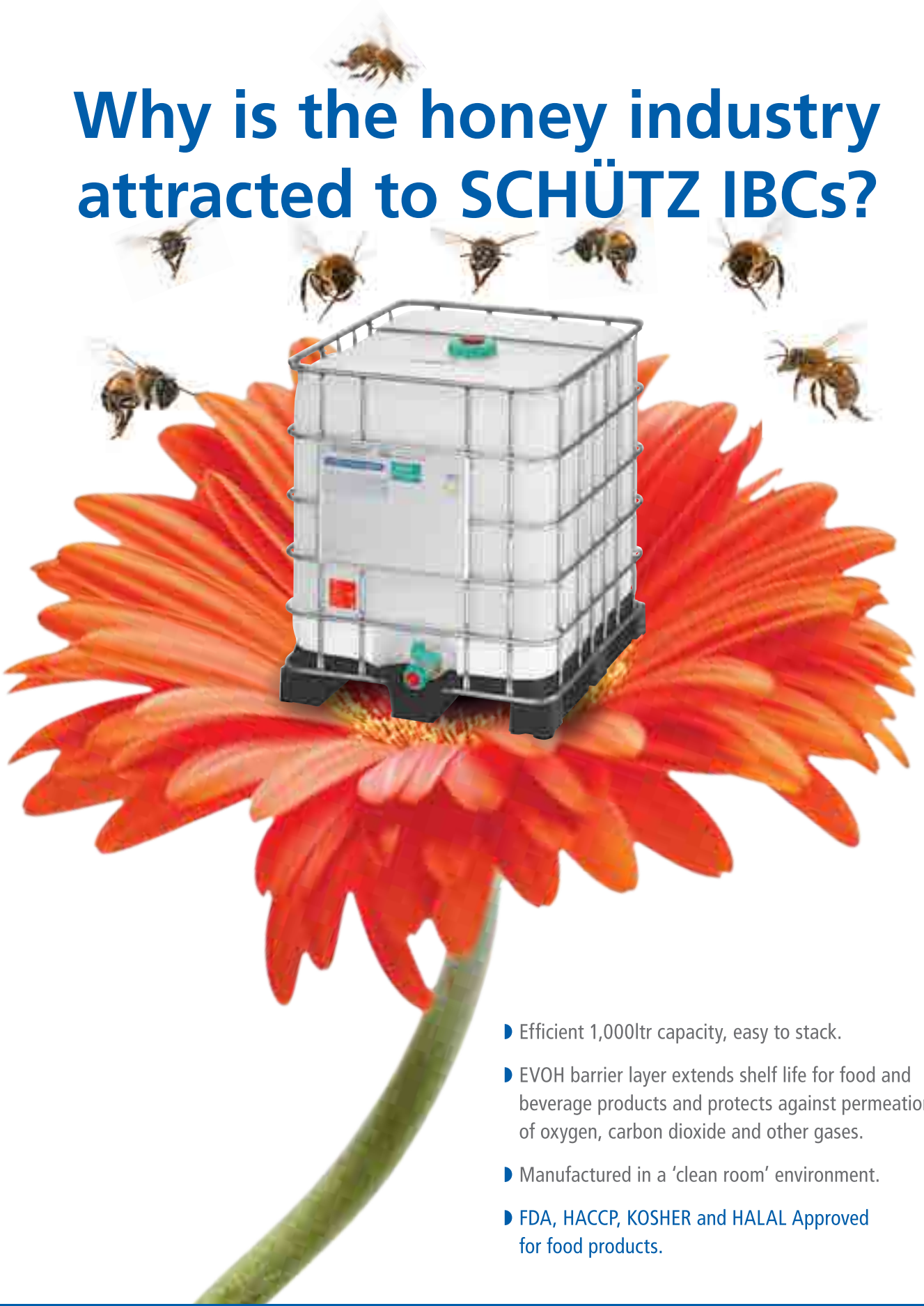

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