AUSTRALIA'S

HONEYBEE NEWS

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Inside:

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AUSTRALIA'S HONEYBEE NEWS

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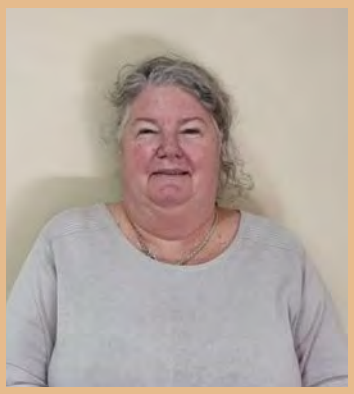

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PRESIDENT'S REPORT

La Nina has certainly left her impact on Eastern Australia. Higher than average rainfall in most areas and lower than normal temperatures with humidity through the roof. This has caused greater than normal problems with SHB in many areas. It appears likely that LaNina will continue well into the coming Autumn. Which would result in a good winter cropping season.

Many trees have gone to growth with both short and long budders putting on bud. It appears that honey production is well above average with both packers and beekeepers having high stocks of honey. This has resulted in a drop of the honey price with reports of some packers cutting quota's and not buying some types of honey typically ground flora including Canola.

It will be interesting to see if an almond pollination payment may be preferred option for some beekeepers this coming spring rather than working canola given the depressed price and difficulty selling canola honey. Whereas the demand for almond pollination units is increasing and price rises are expected.

We have been informed of the resignation of Peter Day, DPI Director of Compliance and Integrity Systems, the NSWAA have enjoyed a good working relationship with Peter and wish him well in his future endeavours and look forward to working with his replacement when the position is filled.

We are looking forward to returning to Honeyland at the Royal Easter show this year after a two-year absence due largely to Covid. I'm asking **ALL** members to please get behind this. With a glut of honey and downward pressure and prices it has never been more important to build customer confidence and to promote Australian honey!!

Honey donations have been coming in and we are close having enough to cover the stock required. To the Branches and beekeepers who have donated honey, it's really appreciated by your industry we thank you! What we now need is volunteers to work at the show, we **really** appreciate the support of the ABA, but this event is run by the NSWAA and it is in the interests of all beekeepers to educate the public and promote Australian Honey. We are aiming to have an executive member present on each day of the show. Please contact Debbie Porter to lodge your availability to Volunteer.

Our next Executive meeting will be held in Tamworth on Monday the 28th February 2022. We have invited two senior members and one up and coming member from each branch to attend. This will provide the executive with member feedback and allow members to see how meetings work and hopefully encourage them to stand for election to the NSWAA Executive in the future!

The BPass team will be in attendance, please forward members concerns prior to the meeting in writing so that they can investigate and have answers on the day.

As previously mentioned there will be a congress held in Sydney during June 2022, we will not be holding a conference during 2022. Our AGM will be held at Rydges Parramatta on Tuesday the 7th of June preceding the congress. The 4th Australian Congress will be held at Rosehill gardens on the 8th to the 11th of June 2022. I encourage everyone to get in early and book accommodation. It promises to be a fabulous event to coincide with the 200th anniversary of the arrival of honey bees to Australia.

Yours in Bees
Steve Cunial President NSWAA

NSWAA Executive Responsibilities

Steve Cunial	**Brian Woolfe**	**Stephen Fuller**	**Therese Kershaw**	**Ray Hull**	**Elizabeth Frost**
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Branch News

In December just past, the North Coast Branch held it's last meeting for the year. This meeting was well attended by 25 members.
Our guest speaker this time was Dr Cooper Schouten who gave an excellent presentation on varroa and tropilaelaps mites, I think we all left with our heads full! Thank you Dr Cooper Schouten for your time and effort, it is really appreciated.

We also agreed to change our meetings to the last Friday of each following months January, March, May, July , September and November. This was because there was a large break over the Christmas period. Any Members in the area around these times are more than welcome to attended our meetings.

Regards
Steve Fuller
North Coast Branch (President)

Branch Meeting Dates

Sydney Metro
First Tuesday of every month at 7.30pm at Chifley College Bidwell Campus, Daniels Road, Bidwell.

Central Tablelands
January - third Tuesday
April - third Tuesday
July - third Tuesday
October - third Tuesday

Riverina
Our meeting dates are usually in the first week of February, May, August, and November each year. Lately our meetings have been held alternatively between Wagga Wagga and Griffith.

Usually on the first Monday, when held in Wagga Wagga and on the first Thursday, when held in Griffith.

The venues change to suit availability.

North Coast
Meetings are generally held on the last Friday of January, March, May, July, September & November

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Your contribution is gratefully appreciated, thank you.

AUSTRALIAN HONEY BEE INDUSTRY COUNCIL INC (AHBIC) NEWS

Full newsletter available from http://honeybee.org.au

News from the Chair, Tevor Weatherhead, AM

As you read this newsletter it will be Helen's last day as our CEO. Helen's resignation has come as a surprise to the Executive but a previous employer has made Helen an offer she could not refuse. So Helen has decided to move on to her next challenge. Helen has been with us for nearly two (2) years now and has made a valuable contribution to our industry. Your executive has now put in place plans to keep AHBIC operating in "business as usual" mode until we are able to recruit a replacement.

Personally I would like to thank Helen for all she has done during her time as CEO. It has been a pleasure to work with her and I, on behalf of our industry, wish her the best for the future.

As a result Helen's resignation, your Executive have been meeting to look at a replacement. A first step has been to employ a consultant to review how we are performing against our Strategic Plan, look at the Position Description and give us some recommendations for going forward. That will be available in mid-February.

In the meantime the Executive have appointed Danny le Feuvre, one of our Executive, to be the acting CEO. Contact details remain the same.

It is not often that I put birthday greetings in my report but I could not let this one go by. Norm Rice turned 100 on 1 January 2022. Unfortunately the home where Norm lives was in lockdown due to Covid-19 infections at the home, he could not get to celebrate this milestone in an appropriate fashion.

Many may not know Norm but our industry is indebted to Norm for his work within our industry. Just a few of his achievements were that he commercialised the use of Instrumental Insemination for queen bee breeding. He pioneered the sending of package bees overseas. He was the Queensland Producer representative and Deputy Chair of the Australian Honey Board when it started in 1963. Norm was responsible for appointing the selling agents in the UK. There were also many things that Norm achieved for the Queensland Beekeepers Association during his time as President.
Happy birthday Norm and may there be many more.

I have been reporting on the cases of imported beeswax that AHBIC has had analysed and have been found to be adulterated and/or contain residues of chemicals not used in Australia. AHBIC has been on to the Australian Competition and Consumer Commission (ACCC) for many months now wanting to have something done to stop these imports or at the worst have the beeswax analysed.
AHBIC has heard back from the ACCC and whilst they have not agreed to our requests they have followed up a company selling imported beeswax in Australia. Their answer was the company has corrected the potentially misleading claims and will be "Removing all references to 'pure natural beeswax material' on the product listings; Removing the Australian flag imagery from these listings; and including details of the manufacturing country (China) on these listings."

I can only plead with beekeepers in Australia that if you are buying imported beeswax get some analysed to make sure it is pure. Our analysis has shown the imported products we have had analysed not to be pure beeswax. You do not want to be responsible for contaminating our Australian beeswax with paraffin and chemical residues. The best way is to support Australian beekeepers and keep our Australian beeswax clean is to buy Australian beeswax.

Planning for the 4th Australian Bee Congress is well underway. There is the website https://australianbeecongress.com.au/ where you can register your interest and be kept up to date with any developments. I hope you have put this in your diary and I will see you there.

NOTE FROM CEO, Helen Goodall

Opportunities do not present themselves every day and when they do, you should not let them pass you by. So, in saying that, this is my last day as the CEO of AHBIC.

My commencement in the role was perfectly aligned with the introduction of COVID and lockdowns, which has meant there has been very limited opportunity to connect face to face with industry. There have been many zoom meetings and telephone calls. I am very thankful to the people who have connected and worked with me over the last 22 months for the good of the industry. The work cannot be done alone, and it is crucial for success to have the support. I would like to make a special mention to Trevor Weatherhead, who has been extremely supportive and very willing to share his wealth of knowledge of the industry.

There has been a lot of work happening behind the scenes at AHBIC and in the first six months of 2022, you will start to see some of the results of this work.

I wish Danny all the best as the acting CEO of AHBIC and I hope you support him in undertaking this role so that industry benefits.

I would like to leave you with this saying to ponder:
If you are bold enough to point out problems, you must be brave enough to try to solve them."
--*Robert Alan Silverstein*

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Honey Bee Industry Development Officer Report

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Factors that influence WORKER LONGEVITY - and does it matter?

Seasonal effects

The Queen

Often longevity, how long an individual lives for, is associated with queens when we speak of honey bees. Queens can live for several years depending on their 'destiny.' Queens survive for longer in climates with harsh winters, that experience a break in the brood cycle. In Australia, where commercial beekeeping is nomadic, queens very seldomly get a break from egg laying and therefore experience shorter lifespans. In commercial colonies queens often live for a year or even less (Page & Peng, 2001).

Workers

We know that similarly to queens, climate also has an effect on workers. So-called winter bees can live up to several months during cold periods of 'hibernation'. Why winter bees live longer has a lot to do with metabolic stressors. Honey bee workers literally work themselves to death as foragers. Flight activity demands high metabolic rates and increases ROS (reactive oxygen species) production, causing oxidative stress. Oxidative stress can lead to apoptosis (cell death) and cellular damage, which are intimately linked to aging. Winter bees have lower metabolic needs which contributes to increased lifespan. Similarly, a study found that honey bees in the tropics show winter bee-like longevity in response to seasonal dearth and brood reduction (Feliciano-Cardona et al., 2020).

In fact, even the temperature at which honey bees are raised influences their lifespan. Pupae raised at the lowest temperatures in the brood nest are the most likely to become winter bees, with temperatures being controlled by their sisters (Tautz, 2008).

Age of first forage

The age at which female workers transition from inhive tasks to a foraging role can significantly impact the longevity of workers. Age of first foraging is a complex trait and controlled by a variety of genetic, physiological and external factors, regulated at the colony level. Bees that started to forage late in life generally live longer than those that started to forage early (Becerra-Guzmán et al., 2005; Rueppell et al., 2007).

Age of first forage therefore provides a trade-off between workers focusing on essential in-hive tasks verses the collection of essential resources.

Sub-lethal effects

Lethal effects can kill individuals or the entire colony. Sub-lethal effects do not kill individuals or the colony, but their health/ quality of life is compromised. Such an example is a shorter lifespan experienced by worker bees, as a result of the accumulation of oxidative damage. Sub-lethal effects can also have other impacts on honey bee health such as reduced fertility for example, as it has been reported for certain pesticides, which can for example affect sperm viability in drones, larval development and egg laying capacity of queens (depending on chemical type).

Sub-lethal factors include:

1. Poor nutrition
2. Infections
3. Parasites
4. Exposure to pesticides
5. Brood temperature and humidity (related to colony strength)
6. Migration
7. Heat stress

The workforce - Workers, as the word suggests, are the workforce of the colony and their productivity and lifespan can have a dramatic impact on overall colony performance!

Not all sublethal effects have the same impact on a colony and the impact is usually more severe when multiple factors are present.

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In the USA a study by Simone-Finstrom et al. (2016) found that the lifespan of adult bees was significantly reduced in migratory colonies used for intensive crop pollination. While migration was flagged as a contributor to oxidative stress compared to stationary hives, food scarcity had an even larger impact. The authors state: "Some detrimental effects of migration may be alleviated by a greater abundance of forage." In addition, rearing conditions were found to affect levels of oxidative damage incurred as adults.

Likewise, honey bee workers can become more susceptible to disease when stressed and consequently experience shorter lifespans. Brodschneider and Crailsheim (2010) note: "Honey bees have evolved many strategies to cope with parasites and pathogens, but if they are nutritionally stressed, they face a major battle."

In fact, *Nosema ceranae*, previously thought to only affect adult bees can also infect larvae and reduces subsequent adult longevity (Eiri et al., 2015)

Finances

From a production perspective, the lifespan of workers will not only 'rob' a colony of its full reproductive potential but can have a substantial impact on a business. One example is the return on honey production.

Faith vs management - The beekeeper and his/her management practices are what can make the difference!

Does the lifespan of an individual bee matter? (And I am asking this question from a production perspective only)

The answer would be no.

If the question was, does the lifespan of individuals from a whole colony matter?

Well, I let you answer that.

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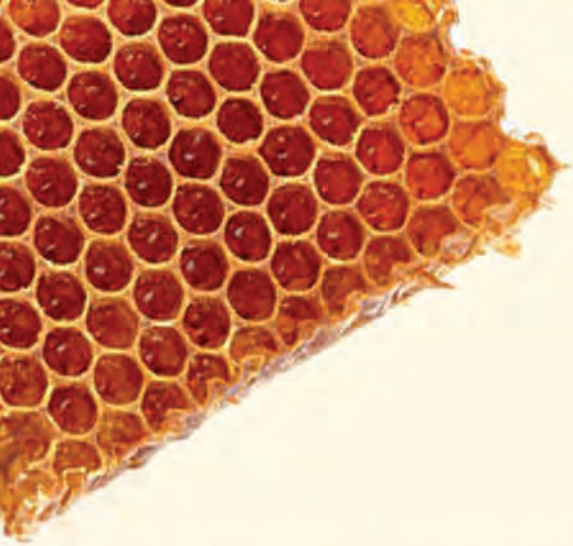

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Technical Specialist, Honey Bees Report

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Bee Breeding: Fertility Part 1

Honey bees are vital for global food security and contribute $14 billion AUD per annum to Australian agriculture and horticulture industries through pollination services (Karasiński, 2018). The Australian beekeeping industry, however, is maintained primarily by honey production as its main source of income, not pollination. In order to sustain a productive industry for honey and pollination, selection for economically valuable traits must be prioritised. Valuable traits such as pest and disease resistance, seasonal population growth, pollen foraging and honey production are characterised as being moderately to highly heritable (Oxley and Oldroyd, 2010). Few of these traits have been continuously and simultaneously selected for in Australia and subsequent improved stock disseminated widely. Doing so will not only improve the profitability of beekeeping in Australia, it will also improve the performance of colonies as both honey production and pollination units.

Figure 1. 10 day old queen cells to be transferred into a portable incubator to maintain queens at an optimal temperature for their continued development and to prevent chilling or overheating. Queen cell sales are a quick way to disseminate stock, but delicate handling and careful introduction is required.

Historically, systematic selection is primarily undertaken in populations managed for research, for traits such as hygienic behaviour (Spivak and Reuter, 1998; Spivak and Reuter, 2001), *Varroa* sensitive hygiene (Büchler et al., 2010; Danka et al., 2011) and pollen hoarding (Hellmich et al., 1985; Page and Fondrk, 1995). Selection for production traits, such as honey production and population growth, which underpin industry viability has been neglected. Productivity traits have been characterised and heritabilities established in honey bees, with established selection methods making meaningful genetic improvement possible for these traits within commercially managed populations (Brascamp, 2016; Chapman and Frost, 2021). The opportunity also exists to include honey bee fertility traits in breeding programs because they are both heritable and highly variable in the honeybee population (Büchler et al., 2013; Rhodes, 2011).

Fertility trait selection is not systematically practised in large-scale honey bee breeding programs, however, with brood viability being the exception. This trait indicates the overall quality of a queen, how well-mated she is (to an average of 12 or more drone sires with diverse sex alleles to her own), overall colony fitness, pest and disease resistance, and capacity for honey production (Oxley and Oldroyd, 2010). Brood viability is the top fertility trait candidate for inclusion in breeding programs. Many beekeepers intuitively select for this trait, also known as the brood pattern. With advances in data collection and analysis, the historically minimal record keeping across the industry and the unique method of reproduction of the species (Brascamp, 2014) are no longer the top barriers to increased selection. Prioritisation of time and staffing to increase systematic record keeping as well as the will to initiate and maintain record keeping is critical. The Plan Bee team can assist with beekeeper data entry, moving hard copy records into digital files for analysis. Fertility traits such as queen weight, overall size and brood viability, which can be assessed in non-destructive ways and may have the greatest return on investment, should be prioritised for inclusion in bee breeding programs.

Figure 2. Brood pattern indicates overall queen quality, how well-mated she is to an average of 12 or more drones, overall colony fitness, pest and disease resistance, and capacity for honey production.

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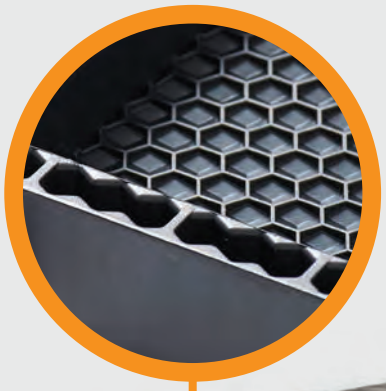

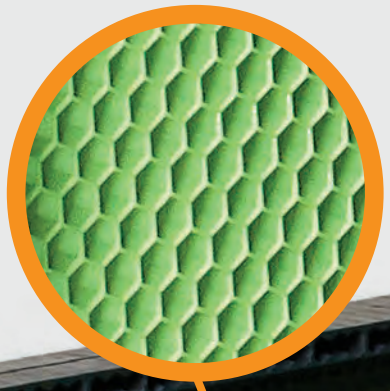

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- Full Depth, WSP and Ideal Plastic Foundation
- Assembled Timber Frames with Plastic Foundation
- Assembled Wired Timber Frame
- Assembled Timber Frame with Plastic Foundation
- Assembled Wired Frame

What's in a brood pattern?

Brood viability is measured by visual assessment of the compactness of an area of brood within the colony. A measure of queen fecundity, high brood viability results from extreme polyandry (mating with multiple drones), virgin queen fitness and sex allele diversity represented in available sires within the drone congregation area and subsequently in the mated queen's spermatheca. De Souza et al. (2013) found a significant positive correlation between queen body weight at emergence, fecundity and colony quality. Soller and Bar-Cohen (1967) found a genetic correlation between total brood area and total honey production and suggested brood area measurements prior to a major nectar production could serve as a proxy measurement for honey production. This hypothesis should be tested in diverse biogeographic regions within Australia where variable nectar production events from our unique floral resources occur. At times these nectar flows are so prolific that it makes other record keeping difficult. If brood pattern recording could serve as a proxy measurement for honey production, the beekeeper could kill two birds with one stone.

Soller and Bar-Cohen (1967) indicate that the queen's daily egg-laying rate during the period before a nectar production event has the greatest influence on brood area and colony level honey production. The study did not include estimation of heritabilities of the queen's rate of egg-laying, but supports optimal rearing practices and selection for queens with higher overall body weight and likely greater quantities of ovarioles (egg producing organs) for increased daily laying rate and brood production.

The inclusion of brood viability in breeding programs is highly recommended as it minimises inbreeding and increases brood viability leading to greater profitability.

Further reading

Check out the freely downloadable Plan Bee Breeding Manual for trait definitions, scoring tools and resources to help you select your bees:
www.agrifutures.com.au/wp-content/uploads/PlanBeeBreedingManual-002.pdf

Email me for a copy of the full manuscript *Breeding for improved fertility of honey bees* which I've based this article on.

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Nick Geoghegan, Apiary Sites Program Coordinator, NSW DPI

Public Apiary Sites Update: BPASS Jan 2022 update by Nick Geoghegan, Apiculture Resource Coordinator, DPI NSW.

We have just completed our first full year of BPASS so thought it would be helpful to provide an update. The BPASS system is part of the NSW public apiary sites policy and aims to provide a single consistent platform for apiarists to discover and apply for apiary sites and manage their existing apiary permits*. With the addition of LLS sites in May 2021 there are now 9,600 sites in BPASS that have current permits and 4,409 potential vacant sites.

While the common assumption was that beekeepers already knew of any suitable sites which had not been taken up, there has been a solid adoption of Long Term Vacant sites: Since the launch of BPASS in July 2020 new permits have been issued for 277 sites that had been vacant for at least two years. These sites have been taken up by 50 apiary companies with an average of 5.5 sites each. This is in addition to an estimated 350 sites with permits issued during the online pilots.

The large volume of enquiries about new sites and the new systems involved resulted in some delays when the initial available sites were published in BPASS. This has significantly improved with time from initial application to land manager approval averaging calendar 9 days since 1st July 2021 and 4-5 days average in recent months.

Adoption of BPASS by beekeepers has been progressing well: 436 Apiarist Companies have permits in BPASS. 384 apiarists have logged in to BPASS to date. 21 apiarists have elected to receive their invoices by physical mail.

To give apiarists more confidence in using BPASS we have started on a series of how-to videos which will be published on TOCAL's Youtube account. We continue to add more information to the BPASS how-to page on the DPI website. A printout of this page can be a useful aide to routine tasks in BPASS. When COVID conditions allow we hope to visit NSWAA branch meetings to provide further support.

The transition to BPASS support being delivered by the biosecurity helpdesk team has reduced the time to respond to enquiries and spread the capability across the working week. Niki is our apiary sites lead in that team. She provides excellent support but we do experiences peaks of calls and she cannot always take calls immediately if she is working on other issues or in meetings related to her role. Apiarists are encouraged to leave a message, send an email or call later in the day.

DPI has also invested a further $50,000 to enhance the capabilities of BPASS including automating some refunds, providing better payment receipts, making it easier for DPI to track service desk enquiries and enhancements to the mapping capability. At time of writing these were in final testing. Check the BPASS page on the DPI website for further information.

If you have any queries about BPASS please contact the apiary service desk via apiary.sites@dpi.nsw.gov.au or call on (02) 6391 3464

** To make it easier to read, "permits" here refers to both Permits and Licenses.*

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Why it is so important to do your Honey Culture Test (Part 2)

Undertaking honey culture tests (HCT) are an important part of managing AFB and keeping your colonies healthy. For anybody running 50 or more colonies they are a compulsory part of adhering to the Code of Practice in NSW (and most other states). Part 1 of my article (which appeared in Nov-Dec 2021 edition) explained how to undertake the HCT.

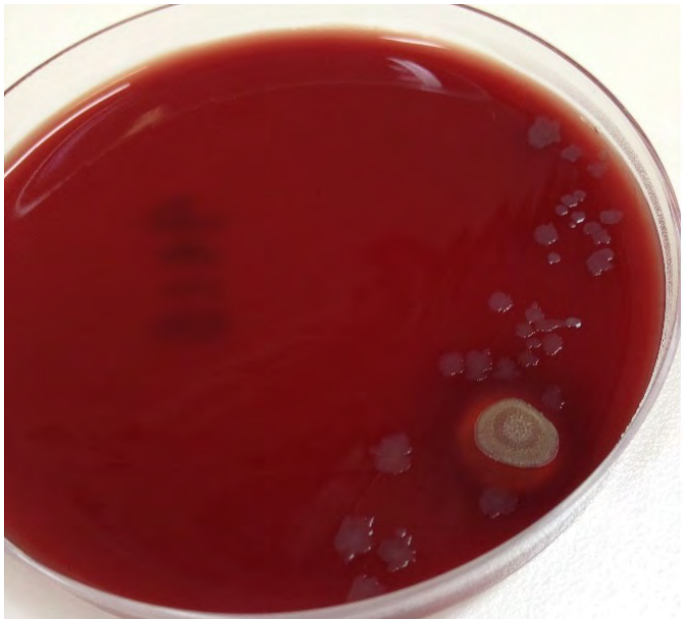
The normal results from a HCT are as follows;
Negative (meaning nothing was detected). The background AFB spore count is either zero or at a level below that which the test can detect. This indicates there is a low chance of finding AFB in the hives that supplied the honey.

1+ (1-20 AFB spores on the culture plate) ~60% chance of finding a hive with AFB in the hives that supplied honey.

2+ (21-49 AFB spores on the culture plate) ~80% chance of finding a hive with AFB in the hives that supplied honey.

3+ (50+ AFB spores on the culture plate) ~100% chance of finding a hive with AFB in the hives that supplied honey.

1+ HCT (approx. 3-4 colonies on this plate)



2+ HCT (approx. 32 AFB colonies on this plate)

3+ HCT. At hundreds of colonies on this plate the amount of viable AFB spores within that honey sample may be millions per kg, and hives are full of AFB. (These 3 pictures are courtesy of Veterinary Diagnostic Bacteriology Team at Elizabeth Macarthur Agricultural Institute (EMAI), NSW DPI.)

What other information this gives the beekeeper;
Loads with nothing detected are currently your most valuable loads. They are the cleanest loads that will be used to make up your new nucs, splits and hives that will replace hive losses from other loads. It is common

The National Bee Biosecurity Program is funded by the honey bee industry through a component of the agricultural honey levy, with state governments contributing in-kind resources. Plant Health Australia manage the program on behalf of Australian Honey Bee Industry Council.

knowledge amongst good beekeepers that you should only make up new colonies with ones that are themselves healthy. The combination of a clean HCT and thorough brood inspections when making new colonies achieves a good level of confidence that your bees are clean. These are also the loads from which you would be sourcing healthy nucs and packages for sale to other beekeepers, as opposed to taking them from hives with AFB (which is unethical).

Whilst the HCT detected no AFB you should not assume they will never get or have AFB that season, so they should still have at least 2-3 brood checks per season and new brood combs added, and preferably run on a barrier system.

1+ loads will need at least 3-4 thorough brood checks performed per season and any infected or suspect hives immediately removed from the apiary. An emphasis should also be put on removing and destroying or irradiating old brood combs and adding new clean foundation to assist with reducing the background AFB spore count. There will probably be brood combs that have honey or stored pollen containing AFB spores, so it is very important to get these out of the brood box to reduce the chance that they may later cause an AFB outbreak. AFB spores can live for decades in capped honey in frames and never cause the disease, but as soon as the bees need to use it AFB could occur, so by removing old combs you reduce the disease risk.

These loads can be run relatively safely with a load barrier as long as you inspect your brood before removing the honey and ultimately swapping boxes onto other hives, but a single hive barrier would be quicker, safer and far better at reducing the risk of cross contamination between hives in the load (so it is definitely worth trying). Any nucs/colonies removed from these loads should be properly identified so as to trace them right back to their source hive, and inspected regularly to ensure they remain healthy. Proper management will clean up this load, whereas poor management will result in the load becoming a 2+ or 3+ load and experiencing more AFB (and costing you more money).

2+ loads are highly likely to have some hives getting close to breaking out with AFB, or may already be exhibiting AFB. During the season these loads should be getting thorough monthly full brood inspections and any infected hives removed and destroyed quickly. As per 1+ management replace old brood combs and irradiate any that are going back into hives. Any weaker hives should (like always) be managed properly to avoid robbing and aim to always prevent dead-outs in your apiaries. It is very unwise to propagate nucs, splits or packages out of 2+ loads until they have been sufficiently cleaned up over the course of 1 or 2 seasons. It would also be best to convert each colony to a single hive barrier at least until no more AFB hives are found and the HCT results are also clear for 1-2 years. To achieve this all spare boxes for that load should be irradiated and marked for the single hive they will then go onto.

Cleaning up an established pool of AFB takes time, so take the job seriously, and show no mercy on suspect or infected hives. In spring it's always very easy to make up lots of extra hives, so don't hold onto hives that are nothing more than dead wood. The quicker you accept that you have an AFB problem and actively start cleaning it up the quicker you will get that job sorted and have your bees and business in far better shape. Record keeping is an important part of this process.

Getting into the brood box and actually looking for AFB is a very important part of managing your disease problems.

3+ loads will have clinical signs of AFB in one or more hives within the load, plus probably a high background AFB spore count in many of the hives. As well as sunken and roping brood you may also see tongues attached to top of brood cells and scale in multiple brood cells if the infection has been going for a while. Scale is especially common if the beekeeper is trying to suppress AFB by ongoing (illegal) use of antibiotics, as their background AFB spore count can be extremely high and there are frequent re-emerging AFB infections amongst multiple hives. This type of load is a ticking time-bomb which experiences regular unpredictable AFB outbreaks, dead-outs (and slime-outs), robbing and readily infects other nearby hives in the same apiary and of other beekeepers.

3+ loads should be considered a major biosecurity risk by the beekeeper (and others around them) and SERIOUS management work needs to be undertaken IMMEDIATELY to start cleaning it up. This starts with

NATIONAL BEE BIOSECURITY PROGRAM

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thorough full brood inspections every month during the season. It is especially important that beekeepers be trained to recognise AFB and brood diseases. The manager or head beekeeper needs to accept that you cannot "cure" AFB with antibiotics or any other non-approved remedy, and train (or retrain) all staff to follow this same management approach to AFB. Rule #1 is any hive showing AFB needs to be removed and destroyed quickly (within 7 days) and not kept alive as some operators (who also regularly get AFB) unfortunately do.

3+ loads should be quarantined away from your (or anybody else's) clean loads and none of its equipment distributed to other loads unless it has been irradiated first. Honey from these loads is extracted last and then the whole plant is thoroughly cleaned to minimise any possible risk of spreading the disease. Ideally 3+ loads are run as a single hive barrier system until all legacy infected hives (perhaps the ones that you allowed to become infected from an old AFB infection that you never managed adequately) have been identified and removed.

3+ loads should have a number of HCTs performed during the season to gauge improvement in health from your management actions. To get the most value out of a HCT you should aim to collect a good sample of honey from hives which you have not recently identified as having AFB. Those newly infected hives should be removed (and destroyed) and their honey boxes put aside for extracting last, and that honey not included in the new HCT sample for that load. When extracting the honey from the remaining "healthy" bees you can do a pooled test of well mixed honey to determine how much more background AFB you may still have. If some of the hives in the apiary were not able to supply a box of honey to extract then mark them for further follow up, as they are not part of the results from the HCT and may be in worse (or better) shape than the HCT results indicate.

3+ infections generally persist and survive when beekeepers are unable to make good decisions about AFB management, often because they mistakenly believe that AFB colonies are still valuable and so don't want to destroy them. The reality is that AFB infected colonies no longer have value for you, but they will cost you a lot of money if you don't remove them from your system ASAP. If you run a good profitable business your accounting staff can easily run the costings for dealing with AFB, which show that the more AFB you have the more it will cost you and the less reliability and profitability your business has. Smart beekeepers (and their accountants) know that it is far cheaper to deal with the AFB problem when it is small than to allow it to get bigger and less manageable, as then it becomes an ongoing cost to your business.

The bottom line;
Beekeepers who have costed out the process of dealing with and removing an AFB hive and bringing through a new hive to replace it have calculated the ultimate cost (financial outlays and missed opportunities for your operation) being around $1000 or more per hive. That amount includes;

- time for employee to prepare the infected hive in the apiary for later euthanizing and removal.
- time for employee to return to site in evening to block up and euthanize hive and return it to base.
- sorting hive and processing materials that will later be sterilized for reuse or burned.
- time and materials required to irradiate (including transport), hot wax dip or burn (which may incur time of materials in storage).
- replacement of burned frames and equipment.
- supply of a replacement colony (even if you make this yourself it has associated costs).
- loss of potential income from pollination, nucleus or package bee production and honey production until such time that it returns to being a production hive.

Any honey recovered from an AFB hive will only go a small way towards covering all these associated costs.

Burning is one of the important process in eradicating AFB.

Just as all big fires start from small ones it also rings true that big AFB infections also began as smaller ones. Please deal with an AFB infection quickly instead of giving it an opportunity to get bigger and more widespread, otherwise by the time it does get sorted the destruction will be so much greater. Therefore don't try to keep AFB hives alive, it's just not worth it.

Legacy AFB operations that are riddled with AFB are like old bee trucks…you can keep them running (most of the time) but the ever increasing unreliability and amount of time, effort and costs involved to stop the wheels falling off eventually make you realise just how much better it

NATIONAL BEE BIOSECURITY PROGRAM

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would be if you did the hard work and got a new, reliable one. Going hard and eradicating EVERYTHING that could have AFB and re building your numbers with clean bees also means the resale value of the operation is far higher than one riddled with AFB.

And it is well known that there are beekeepers in NSW with operations like this, which have high levels of AFB and often rely on regular use of antibiotics to keep their bees alive. The sadder part is that they still think the antibiotics work.

Ongoing AFB is a major risk to the profitability of the company and it is more profitable to clean it up (destroy infected colonies) than trying to keep these infected hives alive. Any weak or diseased hive within such apiaries should be promptly destroyed and any recoverable equipment irradiated. The sterilized equipment can then be used to propagate colonies from the clean loads of bees. The harder you deal with AFB the cleaner your operation will become.

There are many different AFB management options to ensure your business does not go broke whilst you are culling out the infected hives, so If you have an AFB problem in a load (or your entire operation) and would like assistance in managing it then please contact me at rod.bourke@dpi.nsw.gov.au or 0438 677 195

The first step in dealing with your problem is admitting that you do indeed have one, so the second step should be to contact me for a confidential discussion about what to do next.

HONEY BEE KILL IN AUSTRALIA… ALMOND POLLINATION

Chemical concerns after mass bee kill in Australian Almond Pollination

By Cara Waters

Geelong beekeeper John Edmonds used to take his bee hives up to the Sunraysia region on the Murray River every winter to help pollinate the almond farms.

It's a well-travelled route for beekeepers, with over 277,000 hives placed on almond orchards across Australia during blossom season from August to September each year.

However, Mr Edmonds has kept his bees at home for the past five years, deterred by the low prices paid by almond farmers to beekeepers and by the impact of the pesticides and fungicides used on the almond farms on his bees.

Beekeepers are concerned about the impact of chemicals on almond farms. CREDIT:MADELINE BEGLEY

"When we first used to go up 25 years [ago], the bees would go in and they'd come out quite strong," he said. "But in recent years they have been using more and more chemicals that are detrimental to the bees. I'd come home and for three months after your bees aren't very good and I like to produce honey that is clean and green and no chemicals, so I decided it wasn't worth it."

The use of chemicals may have resulted in a mass bee kill on two almond farms in the Sunraysia region this blossom season where millions of bees died.

One beekeeper, who did not want to be identified because he has been threatened with legal proceedings by an almond farmer, said he arrived at one of the farms to pick up his bees in September and found most of them were dead.

"There were piles of dead bees when I arrived, I'm not the only one, there are 30 or 40 beekeepers, which means thousands of hives," he said. "In a world where insects are some of the most important little creatures in pollinating and providing our food, this sort of damage on this monoculture is just not acceptable."

Agriculture Victoria has collected samples of dead bees found near a hive at an almond orchard in the Sunraysia region which are being tested for a range of pesticides.

A spokeswoman for Agriculture Victoria said an estimated 277,000 beehives were moved to the Sunraysia region for the 2021 almond pollination season and having such high hive density comes with some biosecurity disease risk.

"As the matter is currently under investigation it is inappropriate to make further comment," the spokeswoman said. "All complaints received by the department are taken seriously and investigated as appropriate and in accordance with departmental procedures."

Maximum penalties for chemical misuse offences can be more than $72,000 for a corporation, or $36,000 in any other case.

What's happened in Sunraysia is a familiar story around the world.

In the United States, beekeepers who send their hives to the almond farms have seen their bees die in record numbers with *The Guardian* reporting 50 billion bees – more than seven times the world's human population – wiped out in a few months during winter 2018-19.

Beekeepers attribute the high mortality rate to pesticide exposure, diseases from parasites and habitat loss, but environmentalists and organic beekeepers are concerned about the almond industry's mechanization of one of nature's most delicate natural processes.

Australia's $1.8 billion almond industry is booming driven by our thirst for almond milk and the growth in plant-based eating and non-dairy alternatives.

Almonds have grown from a harvest of 10,000 tonnes in 2003 to one of 120,000 tonnes last year, and Australia is the second biggest producer of the nuts in the world.

To read the complete article go to;
Chemical concerns after mass bee kill (theage.com.au)

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CATCH THE BUZZ – AUSTRALIAN BEE STING VACCINE TRIAL HOLDS PROMISE AGAINST ALLERGIC REACTIONS.

Flinders University

Most people have probably been stung by a bee and while it can be painful, it's especially dangerous for the many that are at risk of suffering a life threatening allergic reaction.

Australian researchers have successfully completed a human trial on a vaccine designed to eliminate the risk of a severe allergic reaction to European honey bee stings.

The clinical trial at Flinders University and the Royal Adelaide Hospital included 27 adults with a history of allergic reactions to bee stings.

The vaccine used in the trial contained a unique sugar-based ingredient called an adjuvant, developed in Australia, which is designed to help the body neutralise the bee venom at a faster rate.

Professor Nikolai Petrovsky says the adjuvant used to enhance the bee sting vaccines has now been successfully given to over a thousand individuals across a range of different vaccines including in the current bee sting allergy trial.

"Our technology is like adding a turbocharger to a car and in this case makes the bee allergy vaccine much more powerful, allowing the immune system to better neutralise the bee venom and prevent allergic symptoms," says Professor Petrovsky.

Associate Professor Robert Heddle, lead investigator in the trial, says the aim was to see if the Advax adjuvant would safely speed up and improve bee sting immunotherapy.

"The results of the study were very promising and confirmed the safety of this approach to improving bee sting immunotherapy."

Dr Anthony Smith, an investigator in the trial, says while a commercial bee venom therapy is already available, it requires patients to have over 50 injections over a 3 year period to build up their immune system.

"The current treatment option for serious bee venom allergies is lengthy and cumbersome, so I hope this enhanced bee venom therapy brings about faster, but longer lasting protection to bee stings for allergic individuals."

The Advax adjuvant which enhances the bee sting vaccines was developed in Adelaide by Vaxine Pty Ltd and has also been used to develop vaccines for seasonal and pandemic influenza, hepatitis, malaria, Alzheimers disease, cancer and other diseases.

Honeybees Survived for Weeks Under Volcano Ash After Canary Islands Eruption

For roughly 50 days, thousands of honeybees sealed themselves in their hives, away from deadly gas, and feasted on honey. "It is a very empowering story," one entomologist said.

Five hives that held tens of thousands of bees were covered for weeks in ashes expelled by the Cumbre Vieja volcano. Beekeepers and scientists were delighted to find that they had survived. Credit... Elías González, La Palma Bee Keepers Association, via EPA-EFE/ Shutterstock

By Maria Cramer

Dec. 4, 2021

About 50 days after the Cumbre Vieja volcano in the Canary Islands erupted in September, unleashing lava flows and destroying homes, churches and stores, a beekeeper returned to one of the devastated villages to see what the volcano had done to his hives.

What he found shocked beekeepers and delighted scientists: Inside five hives that had been covered in volcanic ash were tens of thousands of bees, still alive and buzzing away.

Not only had the bees managed to survive the heat and noxious gases of the volcano, but they also had avoided starvation by feeding off stores of honey inside the hive, said Antonio Quesada, a beekeeper in the Canary Islands

and a spokesman for the Gran Canaria Beekeepers Association.

Their survival provided a glimmer of good news for La Palma — a resort island in the Canary archipelago of Spain — which was devastated by the eruption, which continues to spew lava. The island of about 80,000 people employs more than 100 beekeepers who manage hives that hold millions of honeybees, and who are vital workers in the local ecosystem and key economic players for those who sell honey throughout the region.

The bees' ability to stay alive in such dire conditions was also a reminder of their toughness, a characteristic that is often overlooked amid news stories about the very real threats they face from pesticides, parasites and the loss of habitat.

"It's incredible how such a tiny animal that has been around for hundreds of thousands of years can maintain that resilience, that ability to survive," Mr. Quesada said in an interview on Wednesday.

The bees, known in the region as the Canary black bee, used propolis, a resin-like mixture sometimes known as bee glue, to seal themselves inside the hive, he said.

"They protected themselves from the gases" of the volcano, Mr. Quesada said. The bees also made sure to leave open a tiny pathway to the outside that they could later use to get out, he said.

That behavior is typical of honeybees, who use propolis, which they produce from substances they collect from plants and buds, to plug tiny gaps in the hive to protect it from rainwater and drafts, said Nathalie Steinhauer, a researcher in the department of entomology at the University of Maryland.

CATCH THE BUZZ – DOGS IN NZ TRAINED TO SNIFF OUT AFB

TRAINED dogs to sniff out the highly infectious bacterial disease American Foulbrood (AFB) in beehives could save New Zealand's beekeeping industry several million dollars a year.

The Ministry for Primary Industries (MPI) will contribute $50,000 through Sustainable Food and Fibre Futures (SFF Futures) towards the one-year, $95,000 project. The project aims to develop a scientific methodology for training detection dogs to reliably detect AFB, by creating a 'scent picture' of the disease.

It's led by DownUnder Honey, in partnership with Pete Gifford from K9 Search Medical Detection Training Centre and Massey University researchers.

"A big part of the project is trying to come up with a pure form of the disease that can be grown in the lab, with no possibility of other scents in the mix," said Jason Prior, owner of DownUnder Honey.

"This will be introduced to the dogs through a clinically sterile environment."

Mr Prior said it was not the first-time dogs have been used to detect AFB but previous methods have led to inconclusive results in the field.

"When bees have AFB they often have other diseases."

"Previously dogs were trained on infected colonies without isolating the target scent. This project aims to overcome this issue, and produce more reliable detection dogs," he said.

"The new training will focus on detecting actual AFB spores and other relevant AFB bacteria that have come directly from a laboratory."

Overseas, AFB has been managed through use of antibiotics but the disease has developed resistance over time.
New Zealand has always treated the disease through destruction of hives and hive equipment, which has a significant cost to industry.

New Zealand's apiculture industry currently pays over $2 million in annual levies for beehive inspections.

"There's almost a million beehives registered in New Zealand but we're only physically inspecting around 4000 hives a year," Mr Prior said.

"Unless we get some new tools like dogs to rapidly find the disease it gets more and more expensive to find that last five percent of the disease out there."

The industry's ultimate goal has been to eradicate AFB, which would be a world first.

"Dogs can inspect an apiary of 20 hives within two minutes, whereas an inspector could take at least 90 minutes.

"Dogs can also be used to inspect stored equipment, allowing other sources of infection to be identified and destroyed."

MPI director of investment programmes Steve Penno said the project could be a gamechanger for New Zealand's apiculture industry.

"Being able to detect the disease early would reduce lost production and the need to destroy hives."

"The detector dogs could be commercially available to farmers as a service."

The project has also been supported by the Southern North Island Beekeeping Group and the Honey Industry Trust, which have contributed funding and will help with fieldwork.

Cover Photos

Do you have a bee related photograph that you would like to see on the cover of Australia's Honeybee News?

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What can Covid-19 teach us about varroa?

Uncapped drone brood with varroa. Image courtesy of Rod Bourke

Now more than ever, we are aware of how fast pathogens can spread. A single case can quickly be transmitted and turned into thousands more.

Parasitic varroa mites are a lot like Covid-19. The mites are hard to spot, can spread easily, and it's a matter of 'when' they arrive in Australia, not 'if'.

A varroa outbreak in Australia would have major consequences. It is estimated that if varroa were to establish here, 95–100 per cent of the feral honey bee colonies in Australia would die, greatly reducing pollination services. Management pressures from the pest, would likely cause 50–60 per cent of Australian beekeepers (mostly recreational and side-liners/ semi-commercial) to leave the industry. Commercial beekeepers would likely remain, however they would be challenged by increased labour costs to keep hives alive and productive.

So far, Australia has fared relatively well throughout the coronavirus pandemic and are fortunate to be one of the few nations free from *Varroa destructor*. However, as we know from Covid-19, we must remain vigilant.

Considering the similarities between Covid-19 and varroa, we can apply what we have learnt from the coronavirus pandemic to bee biosecurity practices.

The importance of testing

Through the pandemic, we have all come to appreciate the benefits of testing for pathogens. Regular testing is the most effective way to detect outbreaks early and prevent further spread. It's an integral part of any containment and eradication program. Under the Australian Honey Bee Industry Biosecurity Code of Practice, all beekeepers must check at least one hive in each apiary for exotic mites twice per year, at least four calendar months apart (e.g. April and again in September). This can be done by sugar shake, drone uncapping, or alcohol wash.

Importantly, if you do find mites on your honey bees or in the brood, call the

Exotic Plant Pest Hotline 1800 084 881.

Contact tracing is invaluable

When an outbreak happens, it's important that all contacts can be traced quickly so they can be tested and quarantined. For beekeepers, the equivalent of this is being registered with your state agriculture department.

Every beekeeper and their hives should be registered. This information helps to understand biosecurity risks, for example beekeeper densities, and be able to contact beekeepers in the event of a local outbreak.

Help us to help you: make sure your hives are branded and your registration details are up to date.

Success comes from shared responsibility

Maintaining Australia's Covid-free status has relied on everyday people doing their part: maintaining social distance, hygiene practices and wearing a mask when required. In the same way, maintaining our varroa-free status is only possible when everyone shares the responsibility.

The Bee Biosecurity Officers of the National Bee Biosecurity Program work to mitigate risks by:

- managing the National Bee Pest Surveillance Program
- helping beekeepers implement the Honey Bee Industry Biosecurity Code of Practice
- being prepared to respond to biosecurity emergencies.

However, for each biosecurity officer there are at least 100,000 managed beehives. Incursions are most likely to begin at the ports and be detected through the sentinel hives, like the 2018 detection of *V. destructor* in Port Melbourne. However, varroa could quickly spread through urban beehives and make their way to rural, commercial beekeeping operations. Therefore, all beekeepers, regardless of whether you have two or 200 hives or live in the city or country, need to check their hives for exotic mites.

We all want to keep Australia Covid-free and varroa-free, so we all need to practice good biosecurity: keep washing your hands and checking your hives for mites.

Acknowledgement: By Jessica Moran, Project Officer, WA Department of Primary Industries and Regional Development

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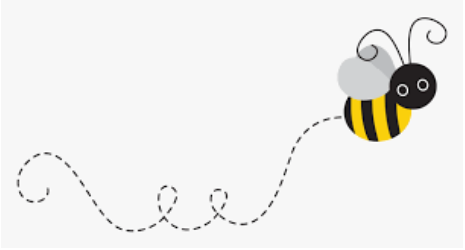

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