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Amateur
Beekeepers
Association
NSW

THE AMATEUR BEEKEEPER

NEWSLETTER FOR MEMBERS
JUNE•JULY 2021

RENEW NOW!

Get your new
membership pack

**FREE
RESOURCES**
Learn-at-home
ideas

**HOW TO AVOID
CHALK BROOD**

**DRONE
SECRETS**

LOCAL RESEARCH
**HONEY'S NEW
SUPERPOWERS?**

SAVE THE DATE

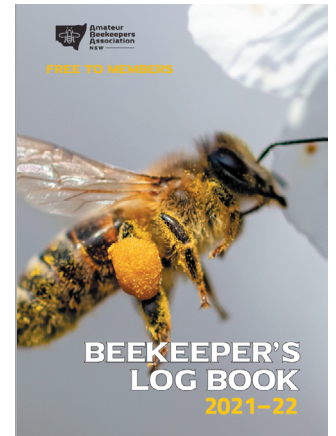
AUGUST 21-22 ABA Conference and AGM



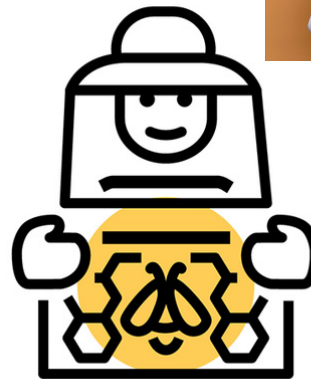
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The *Amateur Beekeeper* is the journal of the Amateur Beekeepers Association of NSW Inc. It is distributed to members six times a year, in December, February, April, June, August and October. Contents are for general information only and should not be taken as legal advice.

The editor will consider adverts from businesses relevant to beekeepers to run free of charge where they contain a discount or special offer to ABA members. Please email editor@beekeepers.asn.au

Cover photo: by Sue Carney. Blue Mountains Beekeepers have been establishing a top bar hive on a new site in Lawson. Do you have a photo you'd like to be considered for the cover of the next issue. Send it in to editor@beekeepers.asn.au

President's report

WELL, I THINK we can safely say winter has arrived! But we know it won't last long, so now we need to get everything in order for spring – repair or replace damaged equipment, and repaint registration or identification numbers on boxes.

The ABA executive committee has been busy organising insurance, managing the membership renewal process and preparing the 2021/22 member packs. This year nearly 2000 members clicked and paid online within 10 days of receiving their renewal notices, which makes it so much easier for us to process renewals in bulk.

We have volunteers from Blue Mountains and Hawkesbury clubs on standby to collate and post member packs in early July.

This year we renegotiated our insurances and were able to reduce the price of our optional Beekeeper's Public and Products Liability cover from \$20 to \$15. (See page 8 for more details.)

Remember: although this insurance covers regular beekeeping activities, it is not intended for commercial beekeepers, defined by our insurer as owning over 100 hives. Full details are at beekeepers.asn.au/insurance.

Amongst all this excitement we've also been planning the **2021 ABA Conference and AGM at Western Sydney University in Richmond on 21 and 22 August**. We were hoping to publish ticket prices in this edition of The Amateur Beekeeper but are still finalising venue and catering costs. We are working hard to make this a relaxed and affordable event, and are looking forward to seeing lots of familiar faces and meeting new friends. Invitations will be sent by email to all members very soon.



Now that clubs and other groups are beginning to get back to face-to-face gatherings I was delighted to be invited to visit my local Girl Guide group to talk about bees. The girls were keen to learn as much as they could about bees, pollination and honey production. I

was invited back a few weeks later (see photo) to present their Bee Challenge badges.

Sheila Stokes president@beekeepers.asn.au

**SAVE THE DATE AGM/Conference
21 & 22 AUGUST Richmond**

Look out for your membership pack

ALL RENEWING and new members will receive a membership pack in the mail during the coming weeks. Your pack will include:

- Membership card for 2021/22. This year's card is white (tied to the current queen identification colour). Names and details are taken directly from the membership register – so whatever you type into the online system will be what's printed on the card.

- AFB diagnosis slide kit. All members will receive a kit that includes two glass slides with cardboard mailers, a form and an instruction sheet. This means if you spot foulbrood problems, you have the equipment you need to immediately take and send off a sample for a free and accurate diagnosis.

- 2021/22 log book. This is the third edition of our popular record-keeping notebook. This book retails for \$15 – so on its own it almost covers the cost of ABA membership! Following feedback from members, this year's log book has new sections and diagrams – to make it even simpler to keep track of your beekeeping tasks and observations. Extra copies are available via our online shop at beekeepers.asn.au/shop

- Instructions to access free online biosecurity training. It takes just 90 minutes and can be done whenever and wherever you like. Make sure you don't miss out on this training – and get your certificate for successful completion.

When can you expect your pack?

Our wonderful teams of volunteers will be compiling, labelling and sorting packs to take advantage of Australia Post's presort and bulk mailing discounts. Our first mailouts will start in early July.

How can you help?

Please make sure you have a correct address saved in the membership system and that this address is recognised by the Australia Post barcode sorting system. We hate it when we receive packs returned to us because members have moved or the mail is undeliverable. It means a lot of work to try to sort out the problem. And we don't want you to miss out!



BIOSECURITY

Notifiable pests and diseases

It is your legal obligation to report certain threats

EACH state and territory has a list of notifiable bee pests and diseases. Work is currently underway to see where these lists can be standardised. Meanwhile it is every beekeeper's responsibility know what is notifiable where they keep their bees – and to take immediate action when they spot anything on the list. Doing your bit will make a huge difference to the health of Australia's bees.

CURRENTLY NOTIFIABLE IN NSW

These 'exotic' pests are classed as 'prohibited matter.' Any evidence or sightings must be reported immediately.

- **Tracheal mite** *Acarapis woodi*
- **Braula fly/Bee louse** *Braula coeca*
- **Tropilaelaps mite** *Tropilaelaps mercedesae* and *T.clareae*
- **Varroa mite** *Varroa destructor* and *V.jacobsoni*
- **Asian honeybee** *Apis cerana*
- **Giant honeybee** *Apis dorsata*
- **Dwarf honeybee** *Apis florum*
- **Africanised honeybee** *Apis mellifera scutellata* and its hybrids
- **Asian hornet** *Vespa velutina*
- **Large earth bumblebee** *Bombus terrestris*

You must report the following diseases within 24 hours of discovery

- **Chalkbrood** *Ascosphaera apis*
- **European foulbrood** *Melissococcus plutonius*
- **Nosemosis** *Nosema apis* and *Nosema ceranae*
- **American Foulbrood** *Paenibacillus larvae*

This list is current for June 2021. Changes are posted at [Biosecurity Regulation 2017 Schedule 1](#) and [Biosecurity Act 2015 Schedule 2](#)

If you spot something unusual, speak up and seek advice immediately



CURRENTLY NOTIFIABLE IN QLD

Any evidence or sightings must be reported immediately.

- **Tracheal mite** *Acarapis woodi*
- **Braula fly/Bee louse** *Braula coeca*
- **Tropilaelaps mite** *Tropilaelaps mercedesae* and *T.clareae*
- **Varroa mite** *Varroa destructor*, *V.jacobsoni*
- **Asian honeybee** *Apis cerana* (outside Cairns known infected area)
- **Giant honeybee** *Apis dorsata*
- **Dwarf honeybee** *Apis florum*, *A. andreniformis*
- **Asian hornet** *Vespa velutina*
- **Africanised honeybee** *Apis mellifera scutellata* and its hybrids
- **Bumblebee** *Bombus* species

You must report the following diseases within 24 hours of discovery

- **American Foulbrood** *Paenibacillus larvae*

These lists are for general guidance only. Please rely on current legislation in your region.

**TO NOTIFY, CALL
1800 084 881**



DISEASES

Latest on chalkbrood

How to keep this scourge at bay



Chalkbrood is a brood disease caused by fungal pathogen *Ascosphaera apis*. It is usually stress-related, with genetic and environmental factors influencing the severity of outbreaks. Chalkbrood has become more of a problem in recent years and research is underway to try to figure out why.

affect the nutrition and health of bees. An infection experiment to test the virulence of three main chalkbrood strains in Australia was also undertaken.

The results showed that a colony's genetic diversity – as in the number of drones the queen had mated with – and the amount of stored pollen were key factors in these chalkbrood infections. Virulence differences between chalkbrood strains may have also contributed to the outbreaks.

The study's recommendation: beekeepers adopt management strategies that target these factors to

A RECENT study funded by Agrifutures compared chalkbrood hives and healthy hives across five apiaries in southern NSW.

The researchers looked at the genetics of the bees and chalkbrood, as well as environmental factors that

reduce the severity of chalkbrood disease.

The report notes, "Beekeepers who purchase queens have no control of mating levels. But maintaining good hive nutrition is a key beekeeper responsibility and a powerful tool to manage diseases. Sugar feeding to stimulate pollen foraging or protein feeding to support nurse bee nutrition are practical strategies that could improve larval nutrition and disease resistance.

Breeding chalkbrood-resistant bees, particularly against more virulent strains, would also be a valuable industry strategy to complement other efforts in breeding for hygienic behaviour or increasing genetic diversity more generally.

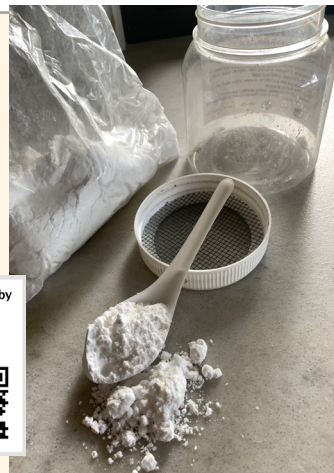
The Agrifutures report: [Investigating factors that influence chalkbrood outbreaks in Australia](#)

MEMORIAL

Linton Briggs

On 24 July beekeepers can remember and celebrate the contribution of Linton Briggs AM to the Australian apiculture industry. He died in 2020. Linton made substantial contributions to many industry challenges including, national quarantine facilities at Eastern Creek, formulation of public policies for protecting the nectar and pollen resource base for productive beekeeping, and the formation and maintenance of industry organisations.

The event for people to celebrate their memories and associations with Linton will be held in Beechworth, Victoria at 1.30pm. For details or to join a live stream, contact info@wheenbeefoundation.org.au



SUGAR SHAKE KIT

This Sugar Shake Kit proudly supplied by
Amateur Beekeepers Association NSW

Please scan the QR code for instructions on use.

NEEED TO get a Sugar Shake Kit so you are ready for next season? The ABA recently purchased and distributed more than 500 kits to clubs so members can perform the twice-yearly checks to detect pests such as varroa. Each club opting into the scheme received 12 or 24 kits to give away to members. Ask your club if it has any kits left.

Missed out? You can buy kits from the [ABA shop](#) for \$15 each plus postage. These contain a mesh lidded jar, sugar mix, spoon, and printed instructions. The label displays a QR code to scan and then watch a video demonstration.



Honey's New Super Power?

Is honey about to move out of the pantry and into the medicine cabinet to treat gut disorders?

Honey has long been used as a traditional medicine. From Ancient Egyptians, and Romans, to the Russian army in World War I, honey has been used to treat wounds and intestinal diseases. However, its place in modern medicine has been limited because of a lack of scientific evidence.

Now research led by the University of Technology Sydney and funded by AgriFutures Honey Bee & Pollination Program aims to provide the evidence modern medicine needs. The work seeks to test honey as a prebiotic to promote good digestive health and to help combat the onset and progression of gut related disease.

Dr Nural Cokcetin, Research Fellow at the University of Technology Sydney, in collaboration with gastroenterologists and clinical microbiome researchers at the Microbiome Research Centre, St George Hospital in Sydney, is exploring the role of honey as a prebiotic food that can promote digestive health.

"We know that honey has been used as a digestive remedy for centuries, but why is that? Our research seeks to understand the science behind how honey changes microbial populations, metabolite production, immune response and inflammation in the gut," Dr Cokcetin says.

"Our diet affects the balance of our gut, and in turn our gut microbiome affects so much of our health, and an unhealthy gut (due to an imbalance of gut microbes) has been linked to gut diseases, colon cancer, irritable bowel syndrome, inflammatory bowel disease, obesity, allergies, asthma, heart conditions, and mental health issues."

Dr Cokcetin said their research shows just a small amount of honey can affect not only the balance of



The **gut microbiome** is made up of trillions of bacteria, archaea, viruses, protozoa and fungi.

Prebiotics are foods that we do not digest by ourselves. Instead they reach our gut where they can be used as a food source by billions of beneficial bacteria, helping maintain a healthy **microbiome**

the types of bacteria living in our gut, but can also be beneficial in preventing the onset and progression of gut-related diseases. It appears when the gut bacteria are 'feeding' on honey they are producing compounds responsible for this protective effect.

"What we're finding is that by promoting a healthy gut, we can build a much stronger immune system and increase our resilience to disease. Just 20 grams of honey a day can boost the 'good' populations of bacteria in our gut that help protect against different diseases."

Dr Cokcetin said that the benefits of honey extend beyond maintaining the balance of gut microbes.

"Our research team have been using an artificial gut system that simulates gut-related diseases and infections to see how honey might work



against common infection-causing bacteria, including *Salmonella* and *E. coli*.

“One of the most exciting findings for us has been the reduction in numbers of a group of bacteria in the gut called clostridioides following treatment with honey. These bacteria can cause some really nasty infections, specifically *Clostridium difficile*, which triggers severe antibiotic-associated diarrhoea and can quickly progress to life-threatening inflammation of the bowel.

“Currently, there are no effective treatments for *C. difficile* and recurrence is high. We are looking into whether honey could offer a cheap, safe and accessible preventative measure or treatment option for this major global health issue.”

Dr Cokcetin said the next step in the project is a human clinical study to look at the impact daily honey consumption has on the gut biome.

“We have started recruiting healthy volunteers to take part in the study and hope the results will show that honey can be used as an effective preventative measure.”

“Our preliminary research shows that it’s likely many honeys will have some kind of prebiotic activity, but they may be acting in different ways. Some might help to boost numbers of beneficial bacteria in the gut, others could support the reduction in numbers of potentially harmful bacteria in the gut (such as *C. difficile*) and others may help promote the production of beneficial compounds by our gut microbes.”



MASSIVE END OF YEAR SALE

JUNE 24 – 26

**In person only deals and
clearance specials**

Check website for details

shop.theurbanbeehive.com.au

U21, McCauley Business Park
19 McCauley St, Matraville 2036
Phone 02 9232 5600
Open Thu - Sat 10 to 3

Dr Cokcetin suggests the best way for consumers to take advantage of the prebiotic benefits of honey is to have a few different Australian honeys in the cupboard.

“Choose the honeys that you like the taste of, making sure they are 100% Australian of course, and enjoy a tablespoon a day on your toast, in your tea or on its own to see the effects.”

Find more information about the research project [here](#)

Dr Cokcetin said that while the highly publicised manuka honey is popular for its antibacterial activity and topical applications, preliminary studies are showing that honey derived from eucalyptus is more potent as a prebiotic.

“Our project has been specifically looking at Australian eucalypt yellow box and ironbark honey, and while there doesn’t seem to be a particular type of eucalypt honey that shows higher prebiotic activity than others, our initial studies showed that compared to manuka and canola honey, the eucalypts in general had better prebiotic activity.

“Although the composition of honey can change from batch to batch, and more significantly from honey type to honey type, unlike other therapeutic properties of honey, for instance antibacterial activity, the prebiotic effect doesn’t seem to be linked to a specific floral type. All the Australian eucalypt honeys we have tested show promise as prebiotics.”

Sweet opportunities for commercial Australian honey producers

AgriFutures Honey Bee & Pollination Manager, Research Annelies McGaw said this research has the opportunity to create a premium product and market for Australian beekeepers.

“This new research provides robust, rigorous scientific evidence that supports honey as a health food. It has the potential to create new innovation and marketing opportunities for commercial Australian honey producers, in turn helping to increase the value of our non-premium honeys,” Ms McGaw said.

“An exciting development from this research is that existing eucalypt derived table honeys show prebiotic activity, further enhancing their profile and value, and generating a unique marketing opportunity for Australian honeys.”

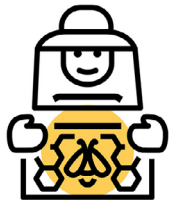
THIS ARTICLE FIRST APPEARED ON AGRIFUTURES.COM.AU/NEWS/FUTURE-OF-HONEY/

Get the most out of your membership

With the ABA holding the annual fee at \$20 for 12 months, joining has never been better value.

Renew early:

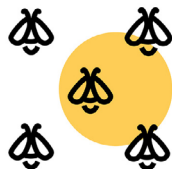
The membership year starts on 1 July and runs through to 30 June 2022. So get the full benefit of joining by signing up now for the full year. The fee will remain at \$20 until 1 April when it will be dropped to \$10 for members signing up for the last three months. Check your inbox for your renewal notice, sent on 10 June.



Understand the insurance: We have negotiated a better rate for members who opt for the insurance: \$15 for the full year. Be sure to check what's covered and what's excluded. As well as covering you for third party

claims relating to your recreational beekeeping, the policy covers selling your honey, propolis, bee venom, beeswax and beeswax wraps, but it does not cover cosmetics such as lip and skin balms or honey with added ingredients such as nuts. It doesn't cover loss of your hives or equipment.

Certificates of Currency are emailed to members the month after they purchase insurance. They are also downloadable at beekeepers.asn.au/portal, where you can also manage your listing on the **Swarm System**.



Use your membership card: Your card is great for identifying who you are at meetings. Slot it into a plastic badge holder and pin it on your chest, or punch a hole on the centre top edge using a paper hole punch and clip it on a lanyard to wear around your neck.

Going shopping? Flash your card when you purchase from bee suppliers and ask if they do discounts for ABA members.



Always forgetting your hive ID? We print it on your card if you give us those details when you renew.

Don't miss out on news:

From time to time we hear about members who aren't seeing the communications we send out via email. To avoid this:

- check you gave us the correct email address (log on to the system via beekeepers.asn.au)

- if several members are using the same email – for instance, partners or family members – each message is sent only to the first member listed. The easy fix: update your records with a different email address for each member.

- check your junk mail or spam folder. Then add our address to your contacts or VIPs list. That way, next time around your email filter should recognise us.

- The problem could be that you've – intentionally or unintentionally – unsubscribed from our mailing list. We can't send you messages unless you opt to resubscribe. Go to beekeepers.asn.au/tab to get yourself back on the mailing list.

Be sure to keep up with club activities: We know that some members join the ABA for the benefits of insurance and don't attend club activities. If that's you, you're missing out!



With 33 clubs now affiliated with the ABA, its never been easier to find a club that's the right fit for you. Check if a neighbouring club welcomes visitors – contact details are on each club's page at beekeepers.asn.au. You can join as many clubs as you wish. Your ABA fee is payable once only each year.



Bee Club

WE OFFER
5% OFF
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WWW.HORNSBY-BEEKEEPING.COM

CLUB NEWS

Gold Coast Beekeepers' New Home

A recent \$35,000 state government grant brings a long-held dream closer to reality, writes GCABS education coordinator Kathy Knox



Gold Coast Amateur Beekeepers Society has operated for over 40 years without a permanent address. While the nomadic practice of meeting in members' homes and local parklands has been enjoyed by all for many years, the need for a permanent facility has become more urgent to accommodate a membership base of over 430 and a suite of resources including an extensive library.

In 2018 the GCABS committee was successful in gaining initial funding of \$35,000 from a state government grant. And in 2020 the executive team secured an idyllic location at the Nerang Country Parklands among a host of other like minded organisations, including community gardens, koala food tree plantations, a food forest, sensory gar-



dens, Men's Shed, Sheila Shack and the Queensland Native Plant Society.

Then earlier this year GCABS was successful in

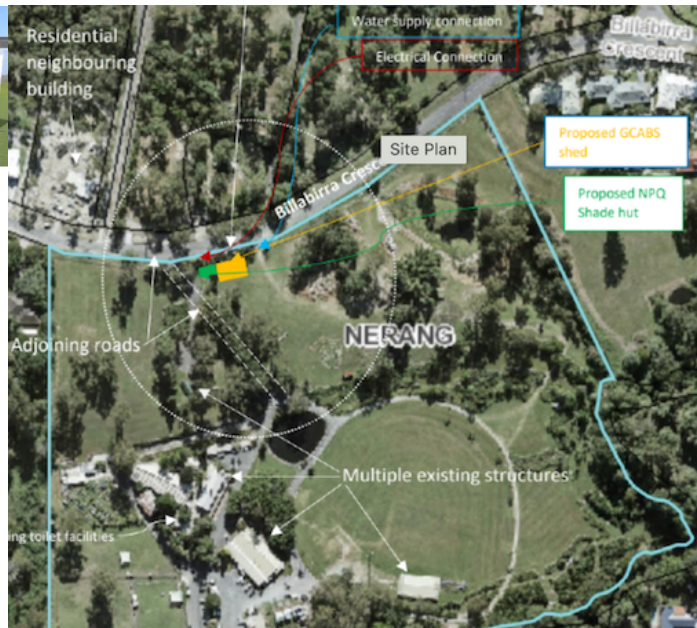
winning a further \$35,000 towards making our club facility comfortable and accessible to all.

Together we have worked over a number of years with eyes firmly on the prize, and we are proud to be able to bring this long awaited project to life.

Thanks to all our presidents, vice presidents, treasurers, secretaries, grant writers, and all other volunteers over the many years of the GCABS operation who have donated their time and energy to making GCABS successful.

GCABS is a strong, friendly and inclusive community of volunteers - we seek to support one another with skills, experience, social networks, and resources to make beekeeping of any species of bee in any style of hive, successful and enjoyable for all.

GCABS AFFILIATED WITH THE ABA IN 2019 AND HAS MEMBERS LOCATED FROM NORTH OF BRISBANE TO SOUTH OF BAL-LINA. IT IS ONE OF THREE CLUBS IN THE ABA NETWORK LOCATED OUTSIDE OF NSW.



Hastings Valley New Apiary

HASTINGS VALLEY Amateur Beekeepers Association held a grand opening of its new apiary site at Charles Sturt University on May 2. The new site was made possible by a host of local businesses and individuals, and grants from Port Macquarie Hastings Council and others. The original opening had been postponed due to the severe floods in the area. The club put their ABA 2020 grant towards establishing hives on the new site.

Taste of the Hawkesbury

HAWKESBURY BEEKEEPERS ran a successful stall at the ever popular Hawkesbury show in April, with members selling a large range of honeys from the club apiary and members' hives.



Especially popular: a beekeeping veil that young attendees could try on for the cameras.

Pictured here: William from North Richmond

EDUCATION

Free or subsidised beekeeping training

Have you ever thought about gaining nationally recognised, formal qualifications in beekeeping? Did you know it might cost you nothing?

CERTIFICATE III IN BEEKEEPING

The Certificate III in Beekeeping is a great way to consolidate and expand your beekeeping knowledge, and could lead to a career in the beekeeping industry.

Training can be expensive, with the full cost of the Certificate III in Beekeeping currently around \$6000. But did you know that at the moment most people living in NSW are eligible for subsidised or even free training?

In simple terms:

- if you are currently working, you're probably eligible for a discount
- if you are currently out of work, the course will probably be free

This is because "beekeeping" is on the NSW Skills List and two programmes can dramatically reduce the cost of training.

SMART & SKILLED reduces the cost to \$1400 - \$1690

To qualify for this scheme you need to be 15 or over, no longer at school, living or working in NSW, and an Australian citizen, Australian permanent resident, humanitarian visa holder or New Zealand citizen.

JOBTRAINER reduces the cost to ZERO

If any of the following apply to you, you may be eligible for FREE training through the NSW JobTrainer programme: aged 16-24; out of work; or receiving an income support payment.

There are currently three Registered Training Organisations (RTOs) who can deliver Certificate III in Beekeeping in NSW.

Contact them now to find out more about your eligibility for subsidised training.

Tocal College tocal.nsw.edu.au

Walan Miya walanmiya.com.au

Joblink Plus Training joblinkplustraining.edu.au

What about Queensland and the Northern Territory? Certificate III in Beekeeping is currently subsidised in Queensland under the User Choice traineeship subsidy programme (for apprentices). The only RTO listed currently to deliver Certificate III training in Queensland is Foundation Training Australia but it is not currently delivering the subsidised course. We are not aware of any RTO delivering Certificate III in the Northern Territory. If this situation changes we'll publish an article for our non-NSW members.

FREE SHORT COURSES FOR CLUBS

Funding may be available for small groups (15 or more) to receive training to be delivered locally. Clubs need to make contact directly with Tocal College to discuss their needs, and to find out if government grants are available to cover course fees. A new financial year is about to start, so maybe the time to apply is now!

SEE ADVERTISEMENT ON FOLLOWING PAGE



"Whether you're a school leaver on a gap year, recently unemployed or upskilling to expand your job prospects, a JobTrainer full or part-qualification is a great way to future-proof your skills, explore new interests and trial in-demand industries."

At some point funding for the JobTrainer scheme will end. If you are interested in gaining your Certificate III in Beekeeping, we suggest you contact your preferred RTO as soon as possible

Tocal College Beekeeper training

- Are you a beekeeper looking to **upskill or increase efficiency** by taking Nationally Accredited Skills Training?
- Have you been affected by **Bushfire, Floods or Drought**?
- Do you know of a **group of 15** or more people who would be interested in funded training in your regional area?
- Do you have **access** to bee hives and a facility for classroom training?

Tocal College has a range of accredited beekeeping courses, and **we can work with you** to tailor a program to meet the training and skills needs that you require.

Send us an email to discuss your training needs beekeeping@dpi.nsw.gov.au or call Bianca Giggins from the Honeybee Education Program (02) 4939 8815

www.tocal.nsw.edu.au/courses/bees



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BOOKS | EBOOKS

YOUR FUTURE IN AGRICULTURE



Department of
Primary Industries

J21-063

BEE BEHAVIOUR

Drones: In the spotlight

Reprinted from
[The Conversation](#)

Joseph Woodgate explains how drones congregate to mate

Honey bees pollinate a lot of our food crops, they're welcome visitors to our gardens and they are widely kept throughout the world – so much so that some have described them as a domesticated species.

It may come as a bit of a surprise, then, to discover there are big gaps in our knowledge regarding where honey bees mate. The problem is that bees mate in mid-air, possibly up to 50 metres above the ground, where it's almost impossible to observe them.

This is why my colleagues and I spent two years trying to track the flight paths of male honey bees, known as drones. We've published the results in a [new study](#) which helps solve the longstanding mystery of where honey bees mate.

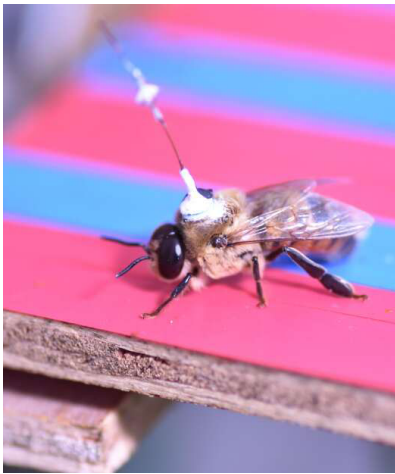
Drones are born in summer and have one aim in life – to mate with a virgin queen. New queens make up to six nuptial flights at the start of their lives, during which they mate with six to 24 different drones. They store the sperm, which they use to fertilise all the worker eggs they lay for the rest of their lives – more than 1000 per day.

From a few days old until they die, at around three weeks old, drones leave the hive several times a day looking for sex. But where do they go?

The first clue came more than 200 years ago, when the naturalist Gilbert White wrote of hearing a buzzing on his estate in England. Many beekeepers and scientists believe White was hearing the sound of thousands of drones coming together at a place known as a drone congregation area.

Scientists have investigated these supposed

AUTHOR Joseph Woodgate is a postdoctoral researcher at Queen Mary University of London



congregations by raising a long pole or balloon with either a queen bee in a cage or a “lure” – some cotton wool soaked in the pheromones that queens produce.

A trail of drones will often form downwind, competing to try to mate with the queen. One problem with this technique

is, because drones are attracted to the lures, we can't know for sure how they'd behave when the lures aren't there. Some people suspect the congregations might be created by the scientists themselves.

In the early 1990s, scientists in Arizona used a radar to monitor drone movements at a large bee farm. They couldn't track individual bees but their observations seemed to show drones followed shared routes. We wanted to know more, so we set out to use a different type of radar to reveal the movements of individual drones.

To track the bees we attached small pieces of electronic equipment, transponders, to their thorax. Our radar rotated once every three seconds, “illuminating” its surroundings with a beam of radio signals. When these hit a transponder, they were converted into an answering signal. The radar constantly scanned for these incoming signals, allowing us to work out the position of the bee.

The first thing we noticed was our drones switched between two forms of flight. They used straight, efficient flights between places but often switched to circling, looping flight. We found these convoluted flights were clustered in four specific areas (pictured right): even without lures to attract them, drones cluster in congregation areas.

We looked carefully at the flights in congregation areas and found a pattern. The further they flew from the centre, the more strongly they accelerated back toward it. Imagine marbles sloshing around in the bottom of a steep sided bowl, starting to climb the sides only to speed back to the middle. This pattern of accelerations, also seen in swarming midges, simulates a physical force, keeping the bees bound together and maintaining a cohesive swarm.

Why would so many drones come together like this? The most likely explanation is congregations are a form of “lek” – leks are large groups of male animals who gather to attract a mate. They are com-

mon among birds and mammals, where males often put on elaborate displays to attract picky females.

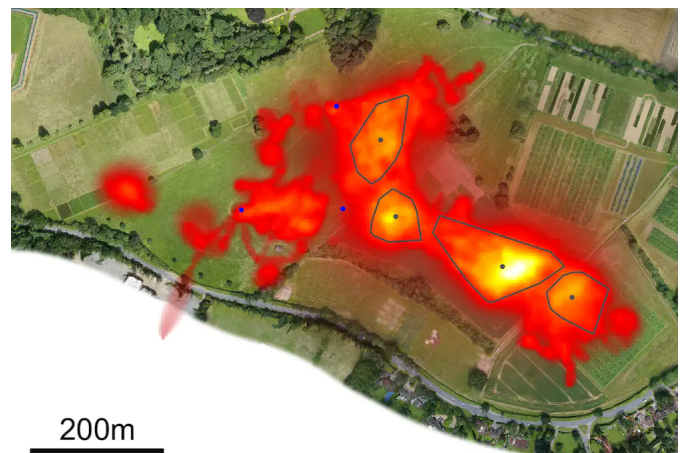
There are several possible reasons why leks might have evolved, but the one most likely to apply to bees is that males gather in places that females are likely to visit. This allows males and females to rendezvous without having to search the entire landscape – a tough proposition when you're as small as a bee.

One major difference between bees and other animals was our bees frequently flew between drone congregation areas, staying for only a few minutes at each, whereas lekking animals are typically very faithful to a single location.

The big puzzle is how drones find these areas. Our results showed that congregation areas will attract bees for at least two years, but no individual drone lives long enough to pass on knowledge about how to find them to the next generation.

We followed some drones from the first time they left the nest, through many subsequent flights. On their first flights, they stayed close to the hive, learning its appearance to find their way home again, but never visited congregations. Some visited congregation areas on their next flights, though, and managed to fly straight there without searching for it.

Whatever signs they use to guide themselves must be obvious from close to the hives and, because drones from different hives visit the same locations,



must be observable no matter where they are. We plan to use a 3D model of the entire field site to reconstruct what our drones see as they flew to the congregations, to find out what they use for guidance.

Understanding drones' mating behaviour will help beekeepers manage breeding programmes and help unravel a longstanding mystery about bee behaviour.

I'm also part of a project taking inspiration from bees to create a new generation of autonomous robots. As we start to understand how bees can accomplish complicated behaviours, we could develop robots that work with less human guidance. ■

SAFETY

Can you handle Phostoxin?

This fumigant is effective – and dangerous. Think twice before you use it without thoroughly understanding the risks. Mistakes are deadly

IN THE PAST BEEKEEPERS routinely turned to tablets of Phostoxin (active ingredient: phosphine or aluminium phosphide and also marketed as Fumatoxin) to fumigate woodware before packing boxes away during the colder months. It works against wax moth and small hive beetle but has a downside: if not treated with the greatest of caution, this chemical is extremely dangerous.

Horror stories are easy to find online where the chemical – fatal at 4 parts per million – has been used in a confined space or inadvertently mixed with water to produce toxic fumes. In the US several years ago four children died when fumes seeped through their family home.

The ABA contacted the NSW Environmental Protection Authority to clarify the complex rules about who can and can't use Phostoxin and in what circumstances.

This advice applies to NSW and is current for June 2021.

What are the basic rules?

In NSW, the [pesticide label](#) is the most important source of information for safe pesticide use.

Under the [Pesticides Act](#) users must abide by label directions, which are extremely detailed (see image above). You must not use a pesticide in any manner not stipulated.

Fumatoxin may be used to control wax moth in stored equipment, and the Australian government has granted [a permit](#) to allow beekeepers to use it in specific circumstances against small hive beetle. The permit specifies temperatures, doses, withholding periods and other critical precautions.

"Compliance with label and permit conditions is critical for ensuring beekeeper safety and minimising harm to the environment," notes NSW EPA.

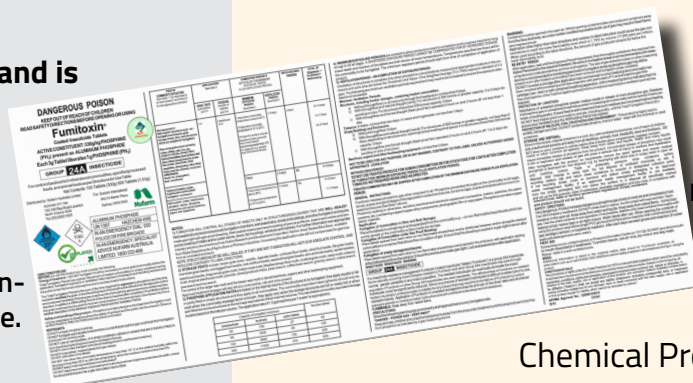
Should I have a license or training to use pesticides such as Phostoxin? The prudent advice: probably yes. The technical answer is a little more complicated. It depends on whether you are using the chemicals as part of a commercial activity or not.

A [training or licensing qualification](#) is required if you are providing pesticides services as part of your work or business or for fee or reward. This is to ensure you can mitigate risks associated with products. But if you are using chemicals in your hobby and not for work or business, you are not legally required to have formal training (but it is still a very good idea).

NSW EPA explains that accredited training will help recreational beekeepers to ensure that they know how to follow the label and permit instructions.

Commercial beekeepers using pesticides as part of their work or business generally must be formally qualified. The training or licensing they require may depend on the type of pesticide they are using.

For information on permits, go to Australian Pesticides and Veterinary Medicines Authority at apmva.gov.au



In NSW, there are additional regulatory requirements for using pesticides declared as Restricted Chemical Products (RCPs) by the Australian Pesticides and Veterinary Medicines Authority.

It restricts the possession of RCPs in NSW because adherence to the label or permit conditions is insufficient to mitigate the risks associated with their use.



POISON

Phostoxin is not an RCP, so possession of Phostoxin is not restricted in NSW.

EDUCATION

Learn from home

READ up on the latest [bee-related research](#) funded by Agrifutures or delve into its rich catalogue of reports. Ever wondered what the market prospects are for [propolis](#)? Care to learn more about [pollination services](#)? Some reports are technical and niche; others are practical or general; and all are free online.

CONVERSATIONS on ABA

Radio National is always good for entertaining interviews with a diverse range of people. A goodie from the archive: native bee researcher Toby Smith talks to Richard Fidler about the [brutal and beautiful world of native bees](#) and starting his career searching for orchid bees in Panama

LISTEN to podcasts about bees and beekeeping when and wherever you like. A new local podcast [Bee Therapy](#) is hosted by Patrice Newell and Dani Lloyd-Prichard, beekeepers from the Hunter Valley. Dani is well known to local beekeepers through her previous roles with Hunter Valley Beekeepers, the ABA and Tocal. Patrice and Dani's magazine style podcast includes reviews, recipes, tips and a quiz.

[extensionaus.com.au](#) is an educational site with a section for professional beekeepers. Anyone can READ the posts that cover a whole range of topics from identifying pollen in honey to authenticate its origin, the ins and outs of varroa treatments at different times of the year, and the large hive beetle from Africa.

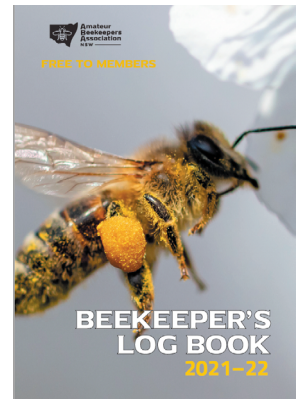
SUBSCRIBE to the NSW DPI Bee Biosecurity Newsletter. It's issued quarterly and contains useful details on beekeeping techniques and, of course, biosecurity. NSW registered beekeepers can sign up at www.dpi.nsw.gov.au/about-us/publications/bee-biosecurity-newsletter

FEEDBACK

Have your say!

DO YOU have comments on how the ABA is run? Want to share your ideas? Think you could contribute to our association? The ABA is run by volunteers who give their time, energies and expertise to assist members, raise the profile of recreational beekeeping and lobby for appropriate support for beekeeping across our geographical network.

Our organisation has grown rapidly and needs volunteers to help implement our next wave of projects. Don't be shy! Email us at feedback@beekeepers.asn.au



SHOW US YOUR BEES!

WOULD YOU LIKE TO SEE YOUR PHOTOS FEATURED IN THIS JOURNAL, ON OUR WEBSITE OR PERHAPS ON THE COVER OF THE NEXT LOG BOOK?

SEND YOUR PHOTOS and a description of when and how they were taken, to editor@beekeepers.asn.au

YOUR ABA

The Amateur Beekeepers Association represents recreational beekeepers in industry forums, and provides a range of services to affiliated beekeeping clubs and members.

With more than 4500 members at the end of the last membership year, that takes some doing!

We are currently looking for members with business or organising skills who are keen to lend a hand either on a regular basis or when we have special projects..

Contact us if you think you could help.

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