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Amateur Beekeepers Australia

THE AMATEUR BEEKEEPER

NEWSLETTER FOR MEMBERS
OCTOBER•NOVEMBER 2022

VARROA EMERGENCY NEW RULES

ALCOHOL WASH EVERY 16 WEEKS

Club apiaries
Pitfalls and wins

HOW TO BREED YOUR OWN QUEENS PART THREE

Varroa:
A cautionary tale

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The Amateur Beekeeper is the journal of Amateur Beekeepers Australia (registered in NSW as The Amateur Beekeepers' Association of NSW Inc ABN 69 273 458 089). It is distributed to members six times a year. Contents are presented for general information only: members should always seek advice tailored to their individual circumstances. The editor will consider adverts from businesses relevant to beekeepers to run free of charge where they contain a special offer to ABA members.

ABA NEWS

President's letter

Sheila Stokes
president@beekeepers.asn.au

IT IS NOW four months since *Varroa destructor* was found in Newcastle, and I continue to work on behalf of ABA members, as well as the broader beekeeping community, as Industry Liaison Officer at the NSW DPI's State Control Centre.

One of my tasks is to review the changes to the Varroa Biosecurity Order, and I have been pushing wherever possible to remove different rules for recreational and commercial beekeepers. As a result, recently the blue zone Hive Movement Declaration programme has been opened to all – rather than just commercial – beekeepers.

To lodge a Hive Movement Declaration form, you need to have completed the Tocal Online Varroa training and be up-to-date with your alcohol wash routine. I urge all ABA members to do the training now, so that you'll be ready if you need to move.

It is vital to record all hive movements in the blue zone, and all alcohol wash results (whether positive or negative) via the DPI website, as the data is used for risk assessments which will support the gradual relaxation of restrictions.

Working in the Varroa Response has been a great opportunity to work with the DPI and to raise the profile of recreational beekeepers as a responsible, cooperative and committed part of the beekeeping industry. Nowhere has this been more evident than in the vast numbers of ABA members who have given their time to fill the critical role of Volunteer Beekeeper in the response field teams. We have had volunteers from most clubs, so I encourage you to recognise and thank them at your club meetings.

RECENTLY the ABA's Biosecurity Officer, Mike Allerton, and I were invited to speak at the *Senate Committee Hearing on the Adequacy of Australia's Biosecurity Measures and Response Preparedness*. It was a credit to the industry that representatives of the recreational and commercial sector presented a united front. I hope our submission results in a greater focus on training so that we have teams of volunteers ready to leap into action in any future incursions.

NEXT MONTH we hold our first face-to-face AGM since 2019 so I look forward to meeting you all in person at last!

ABA 2020 AGM

FACE TO FACE MEETING

November 20 from 9am

ORANGE EX-SERVICES' CLUB
231 Anson St, Orange 2800

THE Annual General Meeting of Amateur Beekeepers Australia will be held face-to-face this year in Orange. This is the first time we have been able to hold an in-person AGM since 2019 at Richmond.

Holding the AGM in Orange continues our tradition of moving this meeting around our different beekeeping regions.

This year we have invited members of the Varroa emergency response team, headquartered in Orange, to present on their latest work and progress to eradicate the mite.

Don't miss this great opportunity to hear from those leading the project to protect Australian beekeeping from this pest.

This session begins at 9 am.

The ABA AGM will commence at 10am.

Members will receive full details of the AGM agenda via email to the address provided when renewing (or joining in 2022). Please keep an eye out for this important information and consider attending.

Our AGM will be followed by a club forum where representatives of ABA affiliated clubs will be able to ask questions, share their experiences, and suggest ways in which the ABA can continue to support recreational beekeepers in the future.

And why not take this opportunity to visit Orange in late springtime and meet up with beekeepers from other clubs and parts of the country?

Please let us know if you are coming along and wish to join an informal dinner on Saturday evening at the Ex-Services' Club from 6.30pm.

For further details on places to stay and things to do in Orange, go to orange360.com.au

BEATING THE ENEMY Varroa

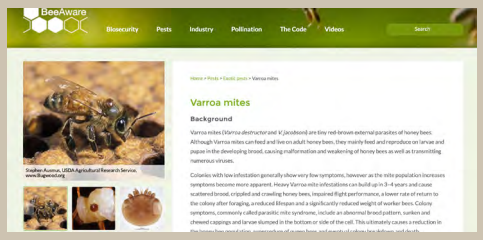
THE ABA recommends that every beekeeper completes the Varroa mite online course created by Tocal College.

https://courses.tocal.nsw.edu.au/courses/varroa-mite-online-training

- **It is free**
- **It doesn't take very long to complete**
- **It's a great way to learn about varroa**
- **On successful completion, you receive a certificate**
- **You'll need this certificate if you want to transport any bees in the 'blue' zone of NSW**
- **Store your certificate on the ABA portal. You can attach it to your membership record, along with any other important beekeeper certificates. Go to beekeepers.asn.au/portal and check out the "My Journal" tab**

The Varroa Emergency Response Hotline **1800 084 881**, is open Monday to Friday 9am to 5pm.

Outside these hours, the hotline has recorded instructions for reaching on-call officers who can respond to urgent and serious matters



beeaware.org.au is your 'Go To' place for accurate Australian info on pests and diseases.

>>> For the latest on the response and NSW rules: dpi.nsw.gov.au/varroa <<<

"Help: what do I use for an alcohol wash test?"

YOU CAN buy special equipment at beekeeping supply stores, or you can repurpose common kitchen items or office supplies in order to strain (separate) the sampled bees from the meths. You can then examine any debris for mites.

We sourced a Lock & Lock 700ml **pickle jar with built-in strainer** from Amazon ($12). Anything shaken off the bees will collect at the bottom of the jar, where it is visible. The dead bees are easily removed inside the strainer bucket, and the debris closely examined on a kitchen towel or white cloth.

Another suitable bit of kit: a **mesh pencil holder** from bargain stores and a **lidded plastic tub** that will allow the pencil holder to fit snuggly inside.

Probably **the most basic kit of all**: a regular honey jar in which to swirl the bees in meths, and a 3mm mesh sieve such as (right) this **kitchen tidy** or the **lid of a sugar shaker**.

To use: put a cup of meths in the jar and add bees. Screw on lid and shake for four minutes. Unscrew lid and pour the contents through the sieve and into a bowl with a white cloth stretched across the top. Examine the cloth for mites.

ABA MEMBERSHIP

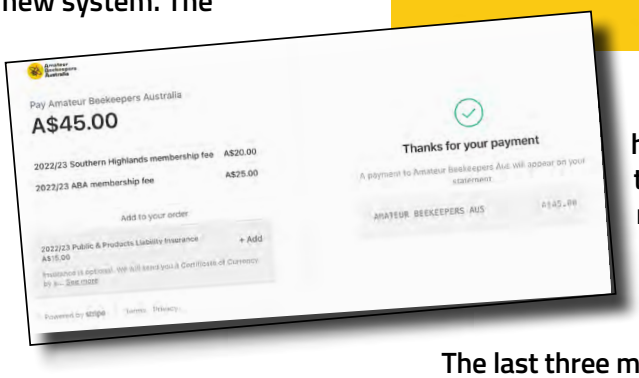
New online system
Why we changed – and why the timing was *awful*

NEARLY SIX years ago the ABA moved member records and payments online. This helped streamline administration and allowed the ABA to grow in size and services. (In 2016, it had 1000 members across 15 clubs. Membership has since quadrupled across more than twice as many clubs.)

But by 2000 our online membership system was already failing to serve our needs. Manual work-arounds may not have been impacting members but they were multiplying the time committee members spent resolving problems. Months of research by a subcommittee made it obvious that no off-the-shelf solution perfectly suited the ABA and clubs. What came nearest would cost tens of thousands of dollars to adopt and adapt.

So it came down to *Could we build something to integrate with our website, swarm register and other systems? And before the cracks in our existing membership platform widened?*

After months of work by Sheila Stokes (an IT professional and current ABA president), and with the renewal season rapidly approaching, it looked like the ABA could move over to a new system. The testing phase was fast tracked, early results looked terrific, and it all seemed doable.



Then came June 22. Eight days before the end of the membership year -- and with 4900 memberships due to renew -- the DPI rang us with a headsup. Samples collected from sentinel hives in Newcastle contained *Varroa destructor*.

A huge emergency response was about to roll out.

The DPI needed an Industry Liaison Officer at the Local Command Centre in Maitland, and Sheila was personally asked to take on the role to represent the interests of recreational beekeepers as the mite eradication plan evolved.

Everything was thrown into the task. The ABA realised it needed to communicate almost daily with our members to share plain English advice. Members and clubs were contacting us for help. The media were asking for interviews and background information.

Thank you!

We appreciate the **kind words and compliments** we've received from members and clubs during this rocky transition.

Your encouragement and patience has been heartening as we've worked through a heavy workload of queries and fixed glitches.

Many members and clubs have told us they find the new system better than the old one. But for those who had problems: we are truly sorry.

(We share your pain: we've worked many hundreds of hours more than any of us ever expected to iron out bugs and reconcile payments.

Much progress has been made.

ABA COMMITTEE VOLUNTEERS

The new membership system, however, still needed work. So we took the decision to postpone renewal notices. Our insurer meanwhile agreed to extend all our existing polices.

The last three months have been a blur of work.

It has been a rocky and frustrating road in many directions– something that we don't need to tell beekeepers, particularly those affected directly in varroa zones of various colours.

But just as there's now steady confidence that varroa can be beaten, and with beekeepers coming to terms with changed rules, lost colonies and new restrictions, we also believe our record and payment system is well on the way to serving the ABA and allow us to support beekeepers a whole new range of ways.

Here's to a calmer future!

Queries? Contact membership@beekeepers.asn.au

LIMITED EDITION

Commemorative honey bee coin

Last chance at this special price

We have only a few of these coins left. The Royal Australian Mint special honey coloured $2 coin commemorates 200 years of honey bees in Australia. It's now a collector's piece.

The uncirculated coins come in a presentation pack and are available to ABA members at $20 including postage.

Limit of one per member. Order yours before they are gone. beekeepers.asn.au/shop

Braula Fly: the other incursion

FIELD CREWS conducting surveillance for varroa mite in the Sunraysia region of Victoria during almond pollination detected Braula Fly in 18 of a group of 38 hives.

Braula Fly is endemic in Tasmania and every continent in the world – but until this discovery was not believed to be in mainland Australia. Braula Fly doesn't affect honey bee health, though its trails can spoil the look of honeycomb. AgVic ran genetic sequencing on the these Braula Flies and found they match the genomics of the Tasmanian flies. This suggests the pest is a geographical spread from the known infested area rather than a fresh incursion. AgVic has not determined the likely entry point or timeframe.

Braula Fly is easily mistaken for varroa and remains a notifiable honey bee pest. Check your Biosecurity Manual for Beekeepers (page 46) or download the Plant Health Australia fact sheet.

IT'S SURVEY TIME

The true value of honey bee queen breeding and production in Australia is unknown.

But now Plan Bee (the National Honey Bee Genetic Improvement Program) is surveying queen breeders across the country about their 2021/22 season to better understand the state of the industry.

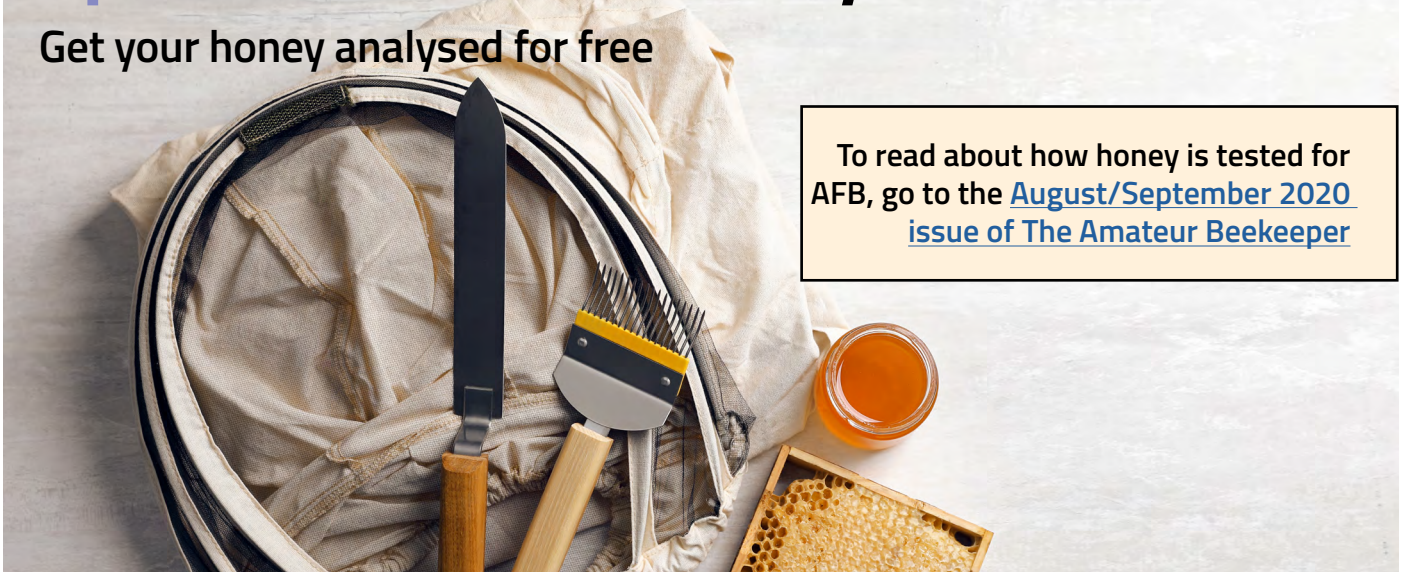
Survey responses will help Plan Bee target future research.

Go to redcap.sydney.edu.au/surveys/?s=WL3YWJYYWJTRTFPJ

BIOSECURITY

Special offer! Discover your AFB risk

Get your honey analysed for free



To read about how honey is tested for AFB, go to the August/September 2020 issue of The Amateur Beekeeper

Do your hives contain trace levels of the spores that cause American Foulbrood?

Or worse – an infection you haven't yet detected?

We are offering 100 members an opportunity to get a sample of their honey analysed – for free.

Again this year the ABA is participating in a project to map the levels of AFB in the environment.

The project is part of the AFB Minimisation Project run by NSW DPI.

Recreational beekeepers who volunteer can have their honey put under the microscope at the state veterinary laboratory near Camden, NSW.

The results will indicate how many AFB spores are present and whether the levels are likely to develop into a full-blown case of AFB. (At very low levels, bees and beekeepers can manage the problem, but once it develops to the point a beekeeper can see signs of the diseease -- dead and decaying brood -- the colony is doomed.

AFB is not a disease to be complacent about. It can strike anywhere. Experienced beekeepers are just as vulnerable as newbies.

Interested? The ABA is supplying sample jars of the correct size to club biosecurity officers.

Get in touch with your club now and ask if you can participate.

The first three samples per club will be analysed for free. If extra people want to participate, the ABA will put them on a reserve list. Alternatively we will provide details of how testing can be organised at the club's or individual's expense (around $40 per sample).

This initiative is open to ALL clubs. (In past years, the project has been limited to NSW.)

Understanding the results. Mike Allerton, the ABA's biosecurity officer will organise for the samples to be analysed. He will then contact beekeepers individually with the results. Results are confidential.

He will also give advice on what the results mean and what, if any, action you will need to take.

- **Talk to your club about participating**
- **Collect the special sampling jar**
- **Fill it with a recent harvest from one, or several hives**
- **Secure your details (name, member number, approximate collection date, postcode) to the jar with an elastic band. (Do not use sticky labels)**
- **Return sample to club biosecurity officer as soon as possible**
- **Continue to monitor your hives for signs of AFB. This project does not replace your general biosecurity duty to watch for pests and diseases**
- **Wait for the results. Timing will depend on how quickly we receive samples from all clubs**

We urge members to get involved. The results will help you – and help protect Australia's bee populations.

VARROA BIOSECURITY OBLIGATIONS

NEW 16-week alcohol wash rule

What *you must do* to give this mite the boot

IF YOU keep bees in NSW, this testing routine is now mandatory.

If you keep bees elsewhere in Australia, this schedule is highly recommended. In fact, the ABA urges ALL beekeepers – in every part of Australia – to adopt the 16-week alcohol wash rule now.

If the current emergency taught us anything it's that robust and frequent surveillance is the only way to fight varroa – and avoid its devastating consequences.

Everyone can help ensure we find and eliminate every last mite here now, and we stymie its chances of getting a foothold in the future.

If you have up to 64 hives: you must perform an alcohol wash test on EVERY hive at least once in each 16-week period. See next page for instructions on how to wash effectively. It's important to sample nurse bees and to alcohol wash them vigorously for at least FOUR minutes to dislodge any parasites.

If you think you've found varroa, call the Exotic Plant Pest Hotline on 1800 084 881 immediately. If the test is clear, in NSW you still need to log the result using the online form at dpi.nsw.gov.au/alcohol-wash

In Queensland use Bee 123

These test reports provide evidence for authorities and will inform future decisions around if or when to relax restrictions on beekeeping in different zones.

So, to support and help the owners who have or will soon have hives euthanised in red zones – 14,000 hives so far – get on board and kick off your 16-week varroa checks now.

Beekeepers with 64 to 640 hives need to alcohol wash 64 hives in each 16-week period; beekeepers with more than 640 hives have an obligation to wash 10 per cent. Everyone should report results.

LOW TEMPERATURE SCANNING ELECTRON MICROGRAPH IMAGE OF VARROA DESTRUCTOR ON BEE HOST. PHOTO COURTESY, ERIC ERBE, CHRISTOPHER POOLEY: USDA, ARS, EMU

REPRINTED FROM LAST ISSUE

Alcohol washing: how to get the BEST results

Follow these tips to make your varroa check as effective as possible

What's changed? These tips boost the effectiveness of an alcohol washing test. They are a step up from previous guidelines, in response to the current emergency.

What to use: Any form of ethanol. The easiest and cheapest drench is methylated spirits.It *can* be diluted to **25% with 75% water** (one part meths to three parts water) but undiluted meths will produce a better result. You can also use rubbing alcohol (isopropyl) or spirits. Do not use petrol.

Safety first: Alcohol is very flammable. Keep it and any associated gear away from your smoker

Equipment: Purpose-made containers retail for between $16 and $45. But you can improvise (see page 4). Use a regular lidded jar (such as a jam jar) to wash the bees in the alcohol and then pour the contents through a mesh or sieve with 3 mm holes.

Prepare: Before you open your hive, measure 3/4 cup (185ml) of your ethanol into your container. Always keep the ethanol well away from your smoker.

Bees: Collect 3/4 cup of nurse bees. That's around 500. As varroa live mainly in brood cells, the bees that spend most of their time tending brood are most likely to be infested.

Remove a brood frame. Check if it contains the queen: you want to keep her safe, so carefully put her back in the hive or temporarily in a queen cage. Shake the adult bees onto a sheet of paper. Repeat with several brood frames. If you didn't spot the queen on the frames, double check the paper.

Don't worry if some bees fly off: the ones left are more likely to be the nurse bees. Use the paper to funnel bees into an empty container marked at the 3/4-cup level. Tip these bees into your washer and promptly close the lid.

The queen: It's worth repeating again: you definitely don't want the queen in your sample since these bees will be killed by the alcohol.

Extras: Any surplus (unjarred) bees should be tipped back into the hive. Close up the hive.

NB: Unless you need to test more hives, you can do the rest of this test away from your site.

How long: Alcohol kills bees quickly. But then you need to vigorously swish the sample around for **four minutes** to have the best chance of dislodging any mites. (This advice has recently been revised up from one minute to make the test more accurate.)

Four minutes is probably longer than you think – count slowly to 240! (Some experts even suggest then letting the dead bees sit in the alcohol for a day to be sure any mites have detached from the bees.)

Tip the contents through a sieve – if your container doesn't have one built in – into a container with a white cloth or filter paper to catch any matter that gets through the sieve. (Coffee filters are ideal.)

Repeat: Swirl and tip twice more using water to further increase the effectiveness of the test.

Look: Use a magnifer or the magnifying function on your phone to examine any specks.

ALERT: Now is not the time to hesitate

- **If you see something suspicious, call the hotline number 1800 084 881**
- **Take a close-up photo of the suspicious matter**
- **Secure all materials in ziplock bags until you get further advice**

Once filtered, your alcohol mix can be stored in a well-labelled container and reused.

Do not tip ethanol down the drain or onto the ground. Dispose of it at regular council chemical collection centres. Dead bees can be burned, buried or wrapped for waste disposal.

BACKGROUND

Varroa 101

Simon Turner gives an overview

THE VARROA MITE was first identified by the Dutch Zoologist Anthonie Cornelis Oudemans Jzr. (Jnr.) in Java in 1904. As a keen zoologist, he specialised in acarology (the study of ticks and mites) and found the now famous mite on *Apis cerana*.

Otherwise, Oudemans was best known for his books on sea monsters and the dodo.

Four known species of this mite parasitise honey bees: *Varroa destructor*, *Varroa jacobsoni*, *Varroa rindereri*, and *Varroa underwoodi*.

Destructor earned its title being the most prevalent and destructive. It has switched hosts many times across bee species in the last 50 years as it made its way around the world through global trade. It has now spread to all regions except the Arctic, Antarctic and some remote islands.

Though there are many genetic types of *Varroa destructor*, only two have successfully adapted to *Apis mellifera*: the highly virulent and widespread Korean haplotype, and the Japanese/Thailand haplotype confined to Japan, Thailand, and the Americas.

The lifecycle of varroa has two phases: the reproductive phase, that takes place inside honey bee brood cells, where a mother "foundress" mite raises her young; followed by the dispersal phase, where mature female mites spread on adult bees.

Varroa use a form of chemical espionage to invade young larval cells undetected. They prefer drone brood as it has a longer gestation period, giving a greater opportunity to reproduce.

Upon invading the brood cell, the foundress hides in the liquid food at the base of the cell, breathing through her peritreme, a small snorkel that extends above the food. Once the cell is capped, she climbs up onto the larva, puncturing a hole in its abdomen to use as a feeding site. This hole is kept open with anticoagulants in the mite's saliva that prevent wound healing.

The foundress will feed on larval tissue before proceeding to the upper cell wall. She will first lay a (haploid) male egg, and working downwards lay consecutive (diploid) female eggs every 30 hours.

The male will mate on the communal faecal pile with the first mature female. Occasionally the male can fail to hatch, crushed through bee larval movement. In this case, the virgin daughters emerge and, lab studies have shown, can lay "parthenogenic" haploid (male) eggs and mate with their offspring. In theory, a female mite can lay up to 30 eggs in seven reproductive cycles, but in normal conditions it's far fewer.

PSEUDOSCORPION PHOTO BY TORBEN SCHIFFERS, HOBOX (HONEY BEE ONLINE STUDIES), HAMBURG

Varroa destructor has a preference to feed on a bee's fat body tissue, located on the underside of the host bee's abdomen. As it connects with the bee, varroa also acts as a vector for pathogens spreading bee viruses.

Deformed Wing Virus (DWV) and Acute Bee Paralysis Virus (ABPV) are the most prevalent.

Varroa mites have no wings or eyes, and cannot crawl between widely spaced beehives, so they need to migrate on adult bees.

Bees affected by varroa spend less time nursing, thereby weakening the overall colony health and, as they move to foraging, this leads to greater dispersal. Weak colonies often fall prey to varroa due to robbing bees or drift. Beekeepers also aid the spread of the mite through management practices.

The effect of varroa destruction was measured in New Zealand, after it was initially detected in 2000. It led directly to a 16 per cent drop in colony numbers and spread throughout both islands by 2013.

The impact of varroa varies depending on the hygienic traits of a colony. Grooming behaviour using forelegs and mandibles to physically remove mites and chew them up keeps a check on varroa numbers. In the USA, scientists have produced a strain of bees, now commercially available, that exhibit elevated grooming and mite biting.

In Germany, pseudoscorpion have been tested as a natural bio-control within specially adapted beehives, feeding on varroa mite in the same manner that feeder fish keep their hosts free of parasites. These pseudoscorpions can consume up to nine mites per day.

ARTICLE BASED ON INFORMATION PUBLISHED IN
VARROA DESTRUCTOR: A COMPLEX PARASITE, CRIPPLING HONEY BEES WORLDWIDE

BIOSECURITY

Varroa. A cautionary tale

Elizabeth Frost recalls the days of climbing to the pinnacle of a mountain she's named False Confidence

THE FOLLOWING is a cautionary tale about underestimating varroa. This tale takes place in the US where varroa mite is established.

When I started in beekeeping in 2008, it was as a student volunteer (aka enthusiastic dogsbody) for bee breeders Susan Cobey and Kim Fondrk at the University of California, Davis (UCD), Harry H. Laidlaw Bee Research Facility.

This was about 19 years after varroa was discovered in California. I had plenty of insect experience working on different entomology field and lab studies while at uni, but no prior beekeeping experience or direct experience with parasites like varroa.

With a general knack for animal handling and the ability to follow instruction, I soaked up knowledge at the UCD Bee Lab from Sue and Dr Robert E. Page's technician Kim Fondrk like a sponge in my four years working as a technician there.

Both Sue and Kim are queen bee artificial insemination masters, managing the New World Carniolan population and research populations for genetic studies, mostly around pollen-hoarding, respectively. Kim is a classic US beekeeper technician: highly practical and free with his knowledge. A what-you-see-is-what-you-get, bring-you-back-down-to-earth type.

Generally, the first couple of years or so into anyone's beekeeping journey (and I was no exception) you reach the pinnacle of a mountain I like to call False Confidence. One has hopefully climbed the steep learning curve by then, making one feel accomplished and slightly invincible.

Elizabeth Frost is
Technical Specialist Bees
NSW Department of Primary Industries
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I'd been monitoring varroa mite levels for Sue for a year and a bit, counting natural mite fall (in the tens of 1000s) on sticky mats from ventilated bottom boards.

Before the mites reached a certain population level, I'd be tasked with treating the research colonies with Apiguard (thymol gel), oxalic acid dribble, or Hopguard strips.

We also baited varroa with their preferred food – attractive drone brood frames – which we removed once the drones were capped and mites trapped within, and froze them, ensuring we put a second frame of drone comb in breeders on schedule for ample mature drones to be available for seasonal AI research and classes.

WHEN I eventually got a few backyard hives of my own, I thought I'd see what would happen if I delayed treatment for varroa. With the UCD research hives, every season without fail we treated for mites once in spring and once in autumn.

Since I studied entomology (the study of insects) and previously worked in pest insect studies, I was familiar

AUTHOR MANAGING UC DAVIS RESEARCH HIVES WITH SUE COBEY (PICTURED FAR LEFT). ABOVE, COUNTING VARROA MITES ON THE METAL SLIDE OF A VENTILATED BOTTOM BOARD DURING THE WINTER OF 2010. PHOTOS BY KATHY KEATLEY GARVEY, WITH PERMISSION

with "IPM" or 'integrated pest management' and I wondered if we were doing the right thing, essentially treating by the calendar, at least from my perspective back then.

In California, where beekeepers and bee hives are plentiful (though not as plentiful as the east coast of Australia!), re-infestation with mites from nearby hives carrying high mite levels is an ever-present concern at any time of year. As I learned over time, without our well-timed spring and autumn mite controls, we otherwise would've reached and surpassed a damaging threshold in the mite population levels.

Beyond this mite threshold, the hive population would crash with more varroa-infested brood than not and many workers emerging with visibly deformed wings. The

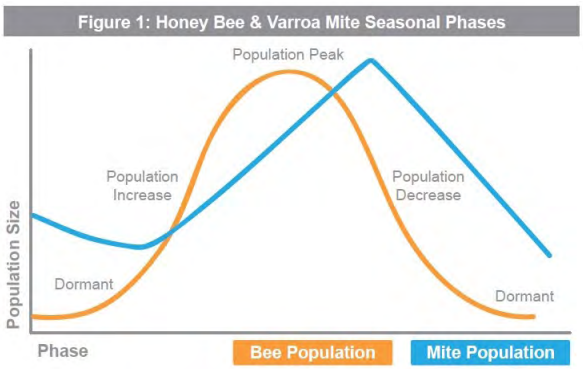
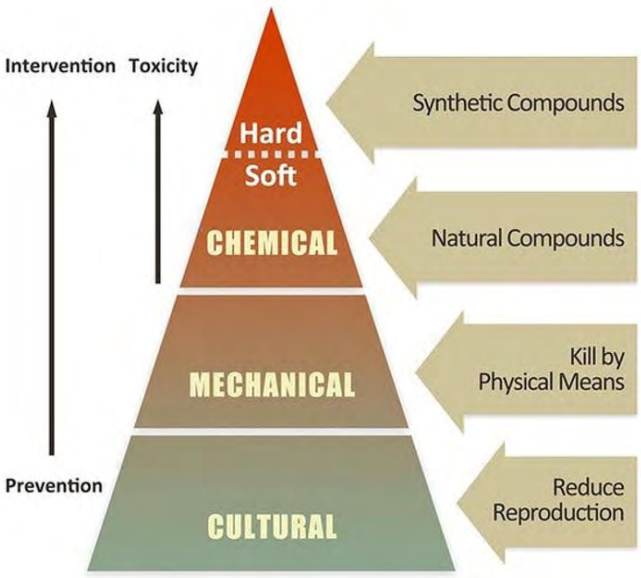


FIGURE 1: HONEYBEEHEALTHCOALITION.ORG

majority of workers which successfully emerge as adults will have a shortened lifespan due to being parasitised during their pupal development. In short, a doomed hive.

Predictably, in the UCD California environment, there was never a season when mite populations (Figure 1) were low enough that I was directed to withhold miticide treatment from the research hives.

Back atop False Confidence Mountain, however, I allowed curiosity to get the better of me. I wanted to see if the mite population growth in my personal hives would be different.



Over several months, mite levels climbed in the two hives in the backyard of my share house. I'd made the predicted spring/summer honey crop of one 10-frame, full depth super, followed by months of dearth. By mid summer, since I did not treat my hives to get mite levels down in spring, the tell-tale symptoms of shotgun brood pattern followed by further brood breakdown, early stage parasitic mite syndrome and emerging workers with deformed wings made it clear that I'd had my head in the clouds atop False Confidence Mountain.

It was time to climb back down to reality otherwise I'd quickly have two dead hives on my hands.

After this wakeup call, on further examination of the UCD Bee Lab mite treatment regime, I realised we actually were practicing integrated pest management (IPM). IPM is essentially a series of pest management evaluations, decisions and controls.

The key IPM concepts for varroa control where it's established, are hopefully steps you're already taking to manage American foulbrood (AFB) and small hive beetle (SHB). The four steps include:

Set Action Thresholds *The point where a pest or disease level requires action to control or eliminate it. Example: for AFB the Action Threshold would be 'Find one cell of AFB, prepare to euthanise hive ASAP and sterilise re-usable equipment.*

Monitor and Identify Pests/Diseases *Be able to assess pest/disease levels accurately, so you can decide whether or not control is necessary. If you are putting out chemical treatments before pest levels require it, for example, you are both increasing your input and labour costs and potentially contributing to pest resistance. Example: for SHB monitor your SHB levels in line with hive population and stress levels to gauge when management/treatment is necessary.*

Prevention *Use preventative control methods before treatment is required. Example: in the US where varroa is established, this could be cultural methods such as splitting hives early in the season which causes a break in the brood cycle (and mite cycle), or mechanical methods such as screened bottom boards and culling the first frame of drone brood of the season.*

FIGURE 2. THE IPM PYRAMID FOR VARROA MITE CONTROL. IMAGE BY NICK SLOFF. EXTENSION.PSU.EDU

Control *This is for when monitoring, identification and action thresholds indicate control of the pest is required and prevention methods are no longer effective. Evaluate appropriate control methods for your unique situation. Example: At the UCD Bee Lab, once the cultural and mechanical prevention methods were exhausted, we rotated treatment types to prevent pest resistance and only used miticides with natural compounds as their active ingredient (Apiguard, Hopguard, oxalic acid).*

However, these hives were stationary so did not have the higher pest re-infestation pressures of US commercial hives travelling to multiple pollination events and to high-hive-density honey production environments.

At the UCD Bee Lab we also had the budget and labour luxury allowing us to rely on "softer" miticide chemical treatments to keep our mite levels low, which is not the case for most US commercial operators.

AUSTRALIA'S TOP beekeeping operations have the deadly combination of floral resource access, knowledge of floral resource life cycle and outputs, hive husbandry skills, pest management skills, business skills, general resourcefulness, can do attitude and drive.

In the face of the current varroa mite incursion and hopefully eradication, existing beekeeper skills can be put to good use. Get across IPM concepts, particularly the Monitor and Identify Pests/Diseases step.

In NSW it's now a requirement for beekeepers to monitor a percentage of their hives for varroa mites three times a year by alcohol washing. Make sure you're implementing this and ensure any beekeeper mates of yours are across it too.

Recommended reading and videos:

Methods to Control Varroa Mites: An Integrated Pest Management Approach

extension.psu.edu/methods-to-control-varroa-mites-an-integrated-pest-management-approach

Honey Bee Health Coalition Guide to Effective Varroa Sampling and Control

honeybeehealthcoalition.org/resources/varroa-management/

Training apiaries. Lessons from ABA affiliated clubs

Kathy Knox surveyed 20 clubs

This article describes a little qualitative study – the quick and dirty kind.

I asked ABA club apiary training officers: ***What do apiaries contain? Where are apiaries located? How are apiaries managed?***

The sample was 20 of the 33 ABA affiliated clubs. I conducted informal qualitative interviews with representatives, including apiary officers, biosecurity officers (each club has one of these) or education officers.

Clubs have one or two apiary sites. Two clubs reported they are yet to establish an apiary but are working on it.

Club apiaries contain between two and 10 colonies, with hives of various designs – Langstroth, Flow, Top Bar, Warré, Long Lang, A-Z. Typically clubs have hives of each hive type for variety and demonstration purposes. The apiary officer is usually a responsible and experienced coordinator directing the traffic; sometimes they have a Certificate 3.

Inspections, extractions and visits to the apiary are carried out before or after a club meeting. Locations vary. Some apiaries are located in schools or colleges, a hospital or park. Some are lucky to

be housed in botanic gardens or showgrounds. Private property is the most common location.

ABA CLUBS have helpful tips for others looking to establish their own club apiary:

LOCATION – Is it going to be steep? Low lying (flood risk)? How will maintenance of the site be managed? Is there storage space?

Security – Each apiary needs to consider fencing, locks, alarm systems and the like

Inclusivity – A theme in ABA club apiaries was ensuring there's access for all abilities, diverse hive styles, young beekeepers

Succession planning – Consider that there are limits to terms of office: committee membership often comes with a 'storage' workload built in

Strategy – Across the network, there are some very sophisticated plans and education objectives, biosecurity plans and apiary management

Ticketing system – Eventbrite is popular for booking places on the training events and managing the attendees

Small hands-on groups are most workable when visiting the club apiary. Training programmes range from relaxed get-togethers to sophisticated multilevel curriculums and an active club with social functions

The direct benefits of having an active club apiary include an excellent source of primary income from training, and secondary income from hive produce or sales of swarms and distribution of nucs.

The indirect benefits of training apiaries are growing informed, engaged members ready to take on responsible beekeeping in their own places.

Of course, the benefits are balanced by some risks:

- **Unavoidable:** flood/fire/disease/colony loss
- **Avoidable:** vandalism or theft
- Best to keep the scale small to avoid **disenchantment**
- Committee roles often entail **storage by proxy**
- Needing to **vacate private sites on short notice**, for example when the landowner plans development or has a change of mood.

TOP TIPS

1. **Don't aim for perfection.** Much to the ire of apiary officers, bees do things, further to the benefit of the novice! It's not all romance. Have variety: people like different things. The aim is to support learning in your community

2. **Team up.** There is likely a community group of likeminded growers, gardeners or makers to share the space, expenses and maintenance

3. **Delegate.** Use small, supervised teams with assigned tasks, and make frequent visits. Use a ticketing system like Eventbrite or Humanitix to allocate attendees to working days

4. **Add value.** Foster a symbiotic relationship. Successful lease arrangements whether formal or informal offer mutual benefits to all parties

5. **Find a champion.** Foster the relationship, nurture it. Draw a Memorandum of Understanding between the lessor/owner and the club.

6. **Feedback.** Give regular reports on the club's apiary at club meetings and in newsletters to reinforce lessons and generate renewed interest and recruits.

Kathy describes herself as a reformed academic who BC (before covid) worked for universities in health and human behaviour research. Kathy currently works in quality assurance for a commercial honey producer and packer, volunteers a lot, and spoke on this topic at the 4th Australasian Bee Congress in June 2022.

ABA 2020 AGM

November 20 from 10 am

ORANGE EX-SERVICES' CLUB
231 Anson St, Orange 2800

The Annual General Meeting of Amateur Beekeepers Australia will be held face-to-face. Look out for details emailed to all members.

IMAGE © KARINE AIGNER

The big buzz by Karine Aigner

A BUZZING BALL of cactus bees spinning over the hot sand on a Texas ranch helped photographer Karine Aigner win this year's Wildlife Photographer of the Year award.

In the action packed close-up, male bees are intent on mating with the single female at the centre. Chair of the contest jury, Roz Kidman Cox says, "Wings-whirring, incoming males home in on the ball of buzzing bees that is rolling straight into the picture. The sense of movement and intensity is shown at bee-level magnification and transforms what are little cactus bees into big competitors for a single female."

Karine captured the flurry of activity as a buzzing ball of cactus bees spun over the hot sand. After a few minutes, the pair at its centre – a male clinging to the only female in the scrum – flew away to mate.

The world's bees are under threat from habitat loss, pesticides and climate change. With 70 per cent of bee species nesting underground, it is increasingly important that areas of natural soil are left undisturbed.

Technical details: Sony 7R III + Laowa 24mm f14 2x macro probe lens; 1/1000 sec; ISO 6400; Profoto strobe + wireless trigger

For more images from the contest, go to www.nhm.ac.uk/wpy

Are you a keen photographer?
Do you have a story to tell about a photo you've taken of your bees or your beekeeping exploits? email editor@beekeepers.asn.au

WEB STORE

Shop online and support the ABA

For all your ABA merchandise, essential biosecurity equipment and more, go to beekeepers.asn.au/shop

Beekeeper's Log Book 2021/22 $5

Want one for each hive? Grab some spare copies now We have limited stocks – when they're gone, they're gone. A5 size. 60 pages plus cover.

2020/21 edition: last copies available. Special price $2

Enamel and metal keyring $10

Featuring the ABA's distinctive bee, framed by the outline of NSW. On the back, there's room for you to add your ID -- perhaps your beekeeping registration number or a trusty contact.. 40mm across

Our popular warning signs suit backyard beekeepers. 200mm by 265mm. Made from lightweight UV-stable material similar to that used for real estate signs. With eyelets for easy fixing. Text reads: *Caution. This area has beehives. There are many bees about. Bees can cause a painful sting. If you are allergic to bee stings you MUST NOT approach the hives as a bee sting can be fatal* ***SIGNS $10 EACH***

Sugar Shake Kit $15

Contains all you need to perform a sugar shake test to check your bees for mites.

Enamel lapel pin $7
Featuring the ABA bee.
Pin with butterfly clip

Classic Enamel Pin

Biosecurity Manual for Beekeepers $3.50

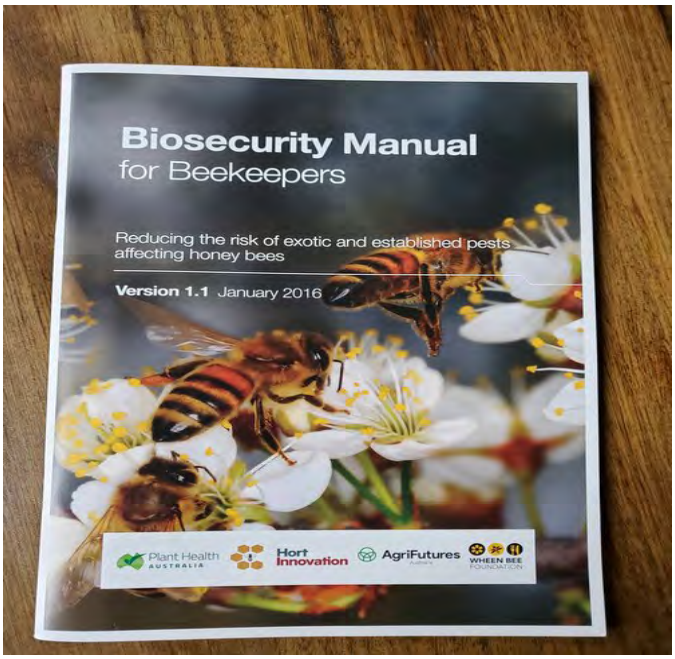
This is your essential guide to local pests and diseases, produced by Plant Health Australia. Available through our shop at cost price.. 64-page A4 printed manual.

AFB brood sampling kit $4

Make sure you have a brood sampling kit every time you open your hives for inspection.

Contains instructions, glass slides, mailers and a laboratory form – all you need to send suspect brood samples off for scientific diagnosis. Versions for NSW/NT and QLD. (The laboratory forms are different for each state.)

Please note: lab testing fees are payable. However if you suspect AFB and are a registered beekeeper in NSW, NT or QLD, your state veterinary laboratory will not charge for this service.



Amateur Beekeepers Australia

SPECIAL SUPPLEMENT

Breeding QUEEN BEES

PART Three

SPECIAL SUPPLEMENT

Rearing Your Own Queen Bees

Kevin Tracy presents the third in a four-part series

WELCOME to those who have just joined the series and welcome back to those who are up for rearing their own queen bees. It is not too late to catch up and it's almost time to start enhancing "local vigour" into your own bees and region.

In this third part we get into more information with emphasis on practical aspects and what you can be doing to prepare and carry out producing queen cells.

Quick revision of Part 2.

Drone Congregation areas can have as many as 20,000 drones

- Drones are haploid (from an unfertilised egg) and carry genetic material from the queen only
- Queens and workers are diploid (from a fertilised egg) and carry genetic material from a drone and queen
- Genetic diversity is better for a honey bee colony
- Choices for selecting a "breeder" queen

BIOSECURITY RULES
Varroa emergency restrictions

It is important to check the current rules on moving bees. In NSW, in mid October recreational beekeepers were allowed to move honey bees from their premises if they complied with a set of legal conditions

WHAT THIS SERIES COVERS

Part 1 May/June Issue

- Benefits and reasons
- What you'll need to get started
- Age-appropriate larvae
- The schedule. Biosecurity
- Glossary

Part 2 July/August Issue

- Basic anatomy of worker, drone, queen
- Drone Congregation Areas (DCAs)
- Races of queens
- Selecting your "breeder" queen
- Choices. Decisions. Actions

Part 3 IN THIS ISSUE

- The Cell Builder (CB) Starter/Finisher
- Cloake method
- Equipment and setup
- Records to keep
- Queen rearing methods explained
- Grafting tools and technique

Part 4 to be released later

- Mating nucs
- Handling queen cells
- Catching, caging, and banking queens
- Marketing tips

KEY FACTS

- Healthy bees are essential
- Nutrition is a key to healthy bees
- The schedule *must* be followed
- Records for rearing queens need to be kept
- Age-appropriate larvae for queens is up to 24 hours old
- Queen cells are a natural occurrence in honey bee colonies.

The three conditions in which the bees will raise their own queen

1. **Emergency** - Sudden death or failure of a resident queen
2. **Supercedure** - Queen pheromone diminishing, she's poorly mated, and/or aging
3. **Swarming** – The bees' natural way to reproduce a colony

Our thinking will focus on what we understand about number **3. Swarming**

Remember that a swarm is most likely when when you have a combination of good seasonal conditions, a large population, reduced available space, and an older Queen.

NB: a swarm is the way a honey bee colony reproduces itself.

Graft *For our purposes I will refer to age-appropriate material that is introduced into a Cell Builder by whatever method, as the graft.*

The Cell Builder (CB)

The Cell Builder is a colony (box or nuc), specially prepared for the purpose of starting and/or finishing our queen cells.

For success, it's of the utmost importance that no adult queen has access to the queen cells.

A queen with access to the queen cells in a CB will kill any queens we hope to develop in those cells.

Find and isolate the queen.

Whichever method you use to manage your CB (for example, there's the starter then finisher method, queenless nuc, Cloake etc), the basic requirements are the same for setting the bees up to attend to the queen cells from Day 1. (Day 1 is the day the graft goes into the CB.)

The idea is to artificially induce the bees into swarming mode. This means the CB needs to have:

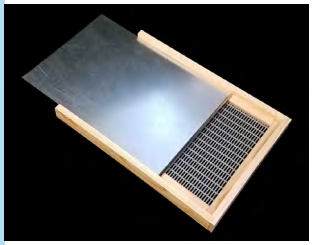
- Good source of nutrition
- A large population
- No queen
- Potential queen cells

The following information and illustration is for the Cloake method of managing a CB. This is both a Starter and Finisher colony.

You'll need this equipment/bees:

- A two-box hive with queen excluder between brood box and super (8 or 10 frames)
- A large population of nurse bees and brood
- Preferably an older queen, eg 2 years old
- An internal feeder for 1:1 sugar syrup (white sugar only)
- A Cloake board (sliding or solid)
- Container with lid, for excess honey frames
- Extra frames used for replacements

CLOAKE BOARD:
A removable solid sheet (metal or plastic) housed in a three-sided rim that sits above a queen excluder. It allows the beekeeper to separate the hive into two. When the sheet is removed, workers can access the whole hive, while the queen remains trapped below the excluder



Most simply, there are 3 stages/steps

Step 1. Cell Builder set up

Top box/super

- Remove hive lid and place top box (super) on lid
- Remove frames (the most capped) from this super to make space for
  - an internal feeder
  - 2 frames of selected brood
  - a frame for the graft

Bottom box/brood box

- Find the queen and isolate her
- Select a brood frame about to hatch
- Select a capped brood frame with no eggs or open larvae younger than 3 days
- Add frames (not honey) to replace removed frames

Back at top box/super

- Install feeder. (Leave empty at this point)
- Place your two selected brood frames, including bees, in the middle of the top box
- If brood box is sufficiently populated, shake 1 to 3 frames of nurse bees into top box

Top Box Configuration:

Wall
HONEY NECTAR
POLLEN
BROOD no eggs
Graft
BROOD no eggs
NECTAR/POLLEN
FEEDER 1:1 sugar syrup
Wall

- Turn bottom/brood box 180° so entrance is now facing where back of box originally was
- Release queen back into box
- Add excluder and Cloake board with entrance facing original position
- Place cell builder/starter (top box) on top of Cloake board
- Add syrup to feeder, 1:1 white sugar only, and replace lid

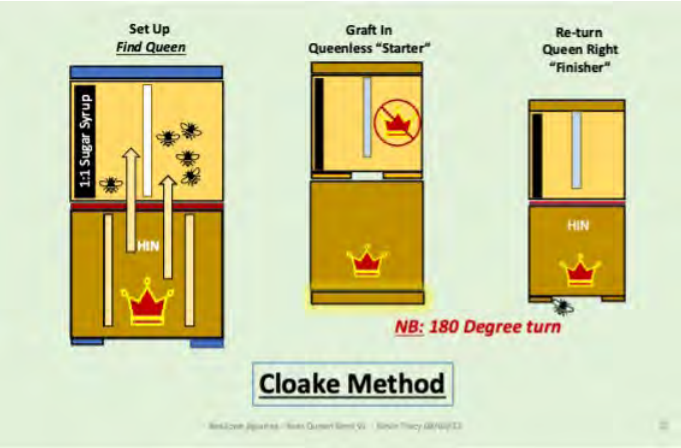
Stage 1 can be carried out the day before the graft OR the same day in the early morning if you are introducing the graft late afternoon.

Step 2. Graft goes into cell builder - starter

- Remove lid
- Create space between brood frames in top box
- Place graft between brood frames ("Day 1" for your records)
- Top up feeder
- Replace lid

Step 3. Finisher

- Quickly check for cell success. (How many are started?)
- Remove top box
- Remove Cloake board
- Leave excluder on brood box
- Turn brood box 180° so entrance is facing original position
- Replace top box (starter)
- Top up feeder



REMEMBER: if any brood frames in the top box contained age-appropriate larvae, you need to ensure no rogue queen cells are raised by the bees. If there are, knock them down because they will hatch before your graft.

Kevin Tracy - Cell builder for queen rearing

WATCH: Kevin demonstrates how to assemble a cell builder using the Cloake method https://youtu.be/wn8cbilyyHU

You *can* rear queen bees

Stick to the timetable – the hard part – and choose a method that best suits your ability and the *number* of queens you want from *which* queen you want.

It is essential that you pay attention to biosecurity, pests, and diseases in all queen production

Queen Production Methods –

1. Frame Transfer

Easy and reasonably efficient for smaller numbers of queen cells

- Prepare your CB
- Choose a frame of eggs and age-appropriate larvae from your "breeder" queen
- Be certain there is no queen on frame
- Transfer frame to CB = Day 1

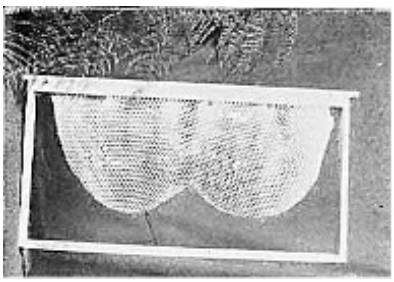
When finished, cells will need to be carefully handled due to the softness of wax.

2. Miller

Process is similar to **1. Frame Transfer**

The difference is a frame cut a "special" way and placed into "breeder" queen colony in advance for her to lay in.

The way Miller works is that the bottom cells, being vertical, are ready to be made into queen cells with the larvae already in them.



Once again, harvest carefully.

THIS IS A PHOTO OF AN ORIGINAL MILLER FRAME. MANY NOW CUT THE BOTTOM OF THE COMB INTO SEVERAL V SHAPES

3. Kits

These are a system. The two most commonly used are Nicot (French pronounced knee-co) and Jenter.

These are used for larger numbers and as a "work-around".

Parts included in Jenter Kit :

- Comb box
- Front and back covers with cover plug
- Cell wall insert
- 115 brown plugs
- 115 brown cups

- 30 yellow cell holders - smooth
- Jenter insertion tool
- Full instructions

The comb box is placed, with your "breeder" queen confined for laying.

The Schedule

TIMING IS CRITICAL FOR SUCCESSFUL QUEEN BREEDING ***Day 1 is Day of graft - Day 10 is when cells are removed frod CB.***

Feed sugar syrup to the breeder colony four full days before you start grafting, and isolate the queen to a frame for grafting material

Prepare cell builder/s including sugar syrup (as above) either the day before grafting or early in the morning if you're grafting in the late afternoon.

THEN FOLLOW THIS TIMETABLE, STARTING WITH DAY 1:

1 Get the frame of grafting material (age-appropriate larvae). Graft into prepared cell cups. Put grafts into cell builder, top up syrup, return brood frame to breeder colony.

2 (Next day) Reconfigure cell builder if required and top up syrup.

3 (Two days after grafting) Check any frames for rogue queen cells (if you had any eggs or very young larvae in the cell builder) and knock them down. Gently lift and check cells for how many are successful/taken.

9 Six days later, catch queens from mating nucs so these nucs are ready to accept the cells.

10 Next day, you place the cells into the mating nucs.

The Queen is supposed to lay in the cups.

The cups are removed and placed on bars.

The hanger is placed in a prepared CB.

Plastic cell cups are easily handled

4. Grafting

Grafting is when larvae are removed from comb and placed into cell cups by use of a grafting tool.

Small to very large numbers of cells can be produced in this way.

Grafting material from "breeder" queen is prepared and selected first by removing comb with material from a hive and placing it on a stand.

A grafting tool is used to remove larvae from cells and then placing larvae into cell cups.

Cell cups/bars are placed on a hanger

Hanger is put into CB (Day 1)

Plastic cell cups are easily handled

There are different types of grafting tools and you will do well to experiment with what works best for you.

I have seen a toothpick used, a carved matchstick, shaped wire, even a fine paint brush.

The most used would be the Chinese grafting tool:

And stainless steel hook type:

We will be using the Chinese grafting tool for our explanations and illustrations as we present . . .

How to Graft

If you have, or can obtain, a grafting tool you could now do some practice grafting.

Queens will come later. Practice grafting now.

You will need

- A prepared CB (Cloake or nuc)
- Frame of grafting material (from "breeder" queen)
- A stand for frame (a book stand can work)

- Good lighting (bright, focused, cool, such as a headlamp)
- Reading glasses and/or magnifier (unless your vision is ace)
- Hanger, cell bar, cell cups
- Grafting tool/s

For hand/eye co-ordination make your first practice at grafting with older larvae.

When comfortable start using the smallest larvae you can (0 to 24 hours old).

Place 0 to 24 hour graft into prepared CB.

LARVAE THE DAY AFTER GRAFT

Check results in CB between 24 and 48 hours later.

To use the Chinese grafting tool

Ensure the tongue/flexible part slides under the larva.

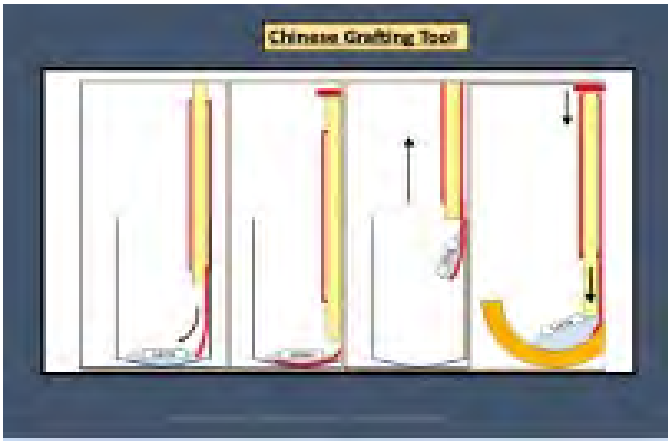
The larva, with royal jelly, sticks to the tongue.

Lift out.

Place into bottom centre of a cell cup.

Royal jelly should stick to cup as you slide tool out.

Use plunger when and if necessary.



- Watch how practice improves your technique and success
- Keep practising
- Keep records
- Keep to your schedule

I do wish I could be with you in person to help guide you through this process. I would be saying "Breathe", "Replace a dud grafting tool", "Too big" and, as was told to me some time ago - "GO for the ROYAL JELLY and HOPE."

Good luck as you refine your skills.

I look forward to your success as you experience the benefits to rearing your own queen bee/s.

Do revisit earlier parts in this series to help you remember what you need to know and practise throughout your queen rearing journey.

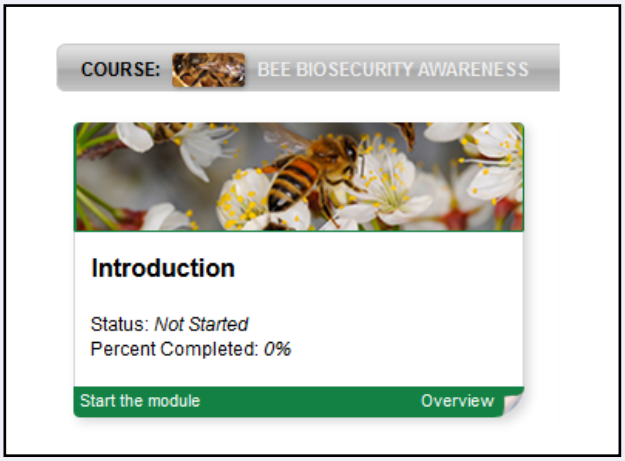
Until next time – practise, and if you have not already, do the BOLT course.

Be Disease Aware: BOLT

IF YOU'RE thinking of breeding queen bees, you'll want to make extra sure your colonies are healthy and that you can spot any signs of trouble at the earliest possible moment. Otherwise, your efforts could all go to waste.

The good news: Biosecurity for Beekeepers Online Training (BOLT) is free for all Australian beekeepers.

The Biosecurity for Beekeepers course explains why biosecurity is important, describes the main pest threats to bees, and shows how to check for pests and diseases.



It's designed for people with a basic understanding of beekeeping practices, but all beekeepers should find it helpful.

For more information about BOLT, click here. A printout with full instructions about enroling was sent to all ABA members in last year's (2021/22) membership pack.

Next time in Part 4, our final in this series, is when you will learn about types of mating nucs, handling cells from CB to hatching and mated queen, catching/caging/banking, and some tips on marketing.

Are you enjoying this series?

We welcome your feedback on this and any other content in **The Amateur Beekeeper**. Do you have ideas for future issues or special series that will enhance your learning or introduce you to new topics? What would *you* really like to read about?

Email editor@beekeepers.asn.au

ABA CONTACTS

MEET THE 2022 EXECUTIVE TEAM

SHEILA STOKES

president@beekeepers.asn.au
web@beekeepers.asn.au

ABA president Sheila is a web development professional who builds, maintains and supports all ABA IT infrastructure.
She has been on the ABA executive since 2015. "Lobbying is the way to ensure recreational beekeepers' voices are heard."

SUE CARNEY

vicepresident@beekeepers.asn.au
editor@beekeepers.asn.au

Sue is a communications specialist with a lifelong fascination for bees. She started the Blue Mountains Beekeepers club and enjoys collecting books about bees and beekeeping. "Bees know it: cooperation and good commmunication are key."

KATHY KNOX

secretary@beekeepers.asn.au

Kathy has been keeping European and Australian bees since 2013. She's a community leader with hobby beekeeping associations on the Gold Coast, and has run a series of successful education programmes for kids and adults in the area.

JACQUELINE LEA

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Jacqueline commenced her beekeeping exploits in 2019 and has enjoyed her involvement with the ABA at club level. She is membership officer for Hawkesbury Beekeepers and is now putting her administrative skills to work as treasurer of the ABA.

KEVIN TRACY

kevin.tracy@beekeepers.asn.au

Kevin has a commercial beekeeping background and now trains beekeepers around Australia. He is a queen breeder and an experienced public speaker. "Well managed bees are kept by commercial and recreational beekeepers. Let's all work together for bees."

DREW MAYWOLD

drew.maywold@beekeepers.asn.au

Drew is the secretary of Gold Coast Regional Beekeepers, and has a background in education and human resources. He's recently been working on an online resources hub for his local club to help members locate useful information.

MIKE ALLERTON

biosecurity@beekeepers.asn.au

Mike began his obsession with bees in 2016. Currently engaged in his Cert III Beekeeping at Tocal College and Master Beekeeper Program at University of Florida, Mike gives bee presentations to garden clubs, schools and anyone else interested in bees.

It all depends on you!

Amateur Beekeepers Australia is run by volunteers elected at the AGM. They each take on a range of duties to represent members, provide services to affliated clubs, and help individual members and the public.

The team meets regularly online or face-to-face to discuss projects, policy and current matters that affect recreational beekeepers and our network of affliated clubs.

The ABA is one of 10 members of the Australian Honey Bee Industry Council – the peak body for the sector in Australia. The ABA is also represented at such forums as the NSW Bee Industry Biosecurity Consultative Committee, and works with government and commercial organisations to promote and support recreational beekeeping.

Now – do you have time and skills to help? This organisation relies on members who are prepared to volunteer in ways small and large, regularly or on a project basis.
Contact any of us on these emails to discuss.