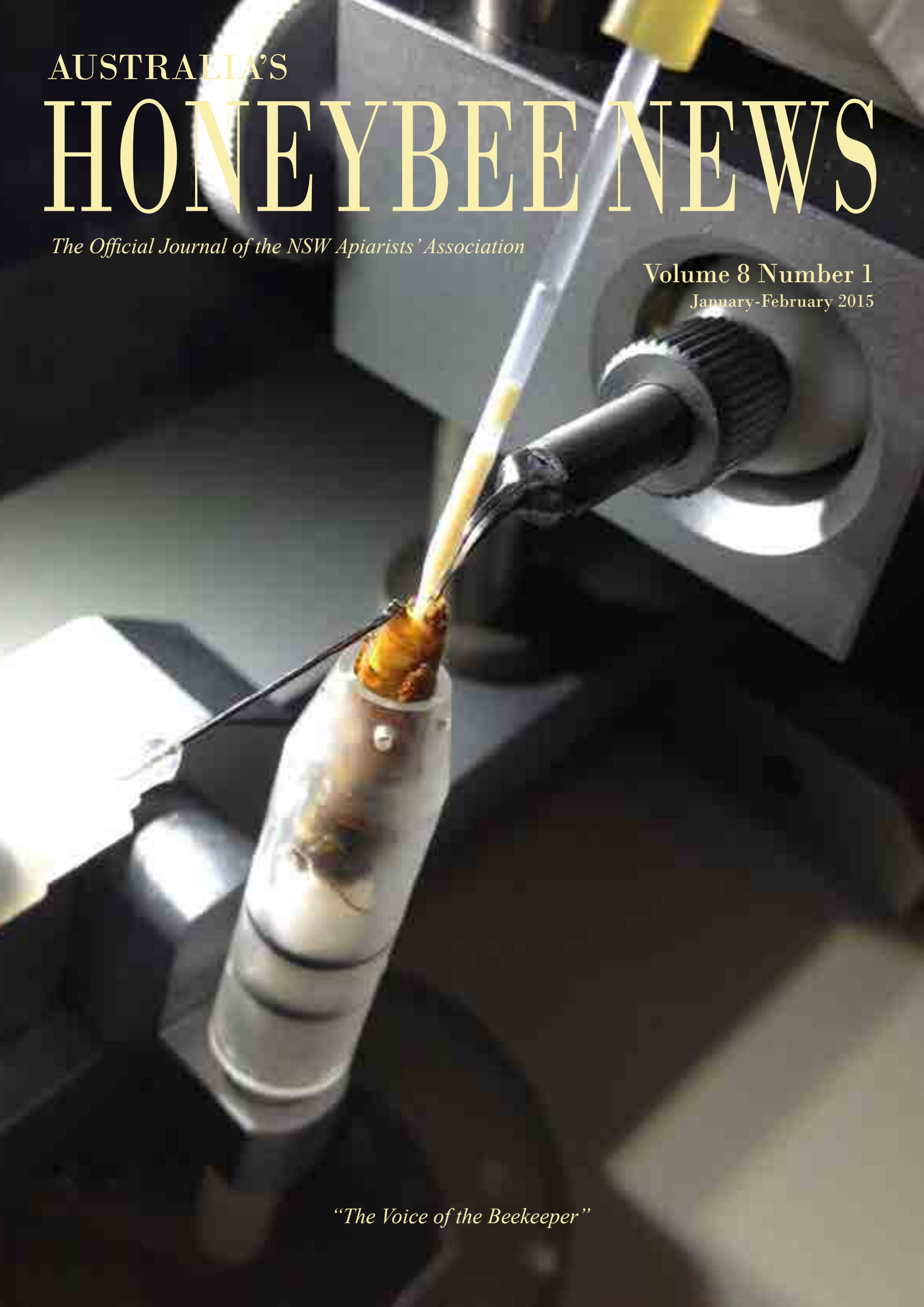

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The Official Journal of the NSW Apiarists' Association

Volume 8 Number 1
January-February 2015

"The Voice of the Beekeeper"

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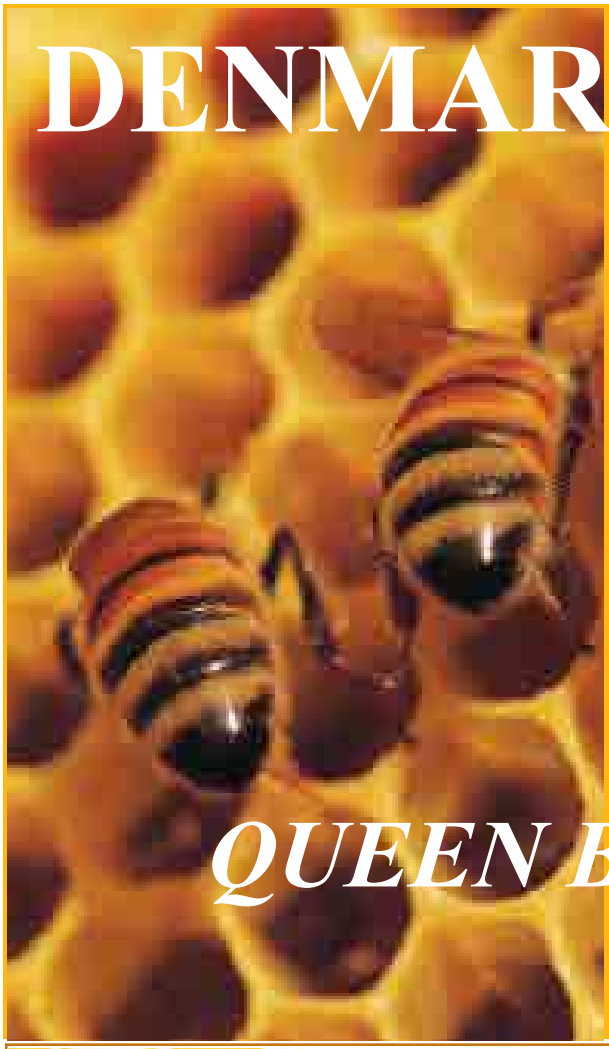

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COVER: Close up of the Schley instrument and a virgin queen pre-insemination PHOTO: Elizabeth Frost

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PRESIDENT'S REPORT

We've been lucky to see some rain during the past month or so in various areas across the State, which means many places are looking much greener than they have for a while. Hopefully this will lead to some bud for honey flow later in the year.

CODE OF PRACTICE AND NATIONAL BEE BIOSECURITY PROGRAM
AHBIC has been working with state associations, government and Plant Health Australia (PHA) to develop a mandatory Biosecurity Code of Practice and a National Bee Biosecurity Program for the honey bee industry in Australia. The recent changes to the honey levy mean an increases our industry's biosecurity investment, allowing an industry contribution of $400,000 per year to the proposed Biosecurity Program.

Industry leaders and governments have been working to refine the Code and Program, and these are now available in draft form for all of industry to provide comments and feedback.

This is extremely important for everyone in our industry – please have a look at the work that has been done and provide any comments or feedback to AHBIC.

See the AHBIC website for information on the program, draft documentation and feedback forms:

http://honeybee.org.au/programs/code-of-practice-and-national-bee-biosecurity-program/

PRODUCERS CONTINGENCY FUND
On the 18 December I took part in a meeting with the Chairman and Executive Director of AHBIC, Ian Zadow and Trevor Weatherhead, as well as the other State Beekeeping Association Presidents, to discuss the changing the Federal Council of Australian Apiarists` Associations (FCAAA) Contingency Fund to the Producer Contingency Fund.

The Producer Contingency Fund has been set up under AHBIC and will be running under the same rules as it did under FCAAA.

INQUIRY INTO RESEARCH AND DEVELOPMENT LEVIES IN THE AGRICULTURAL SECTOR
Following our submission to this Inquiry, we were invited to appear before the Senate Committee, and on 3 February Shona Blair and I attended the Agricultural Levies Inquiry Hearing.

The Executive feel it is very important that we continue to represent the interests of our members and to take this type of opportunity to talk to politicians about the strategic importance of our industry, the challenges we are facing and to encourage them to look at different approaches for helping industry.

We argued that research and development (R&D) funded by levies from the agricultural sector have an excellent track record in this country for increasing the efficiency and profitability of many primary industries, and the RIRDC Honey Bee Program is no exception. However, the currently available funds are insufficient to ensure Australia's honey bee populations remain viable and healthy. The current levy system only allows for levies to be collected on commodities, not on services. So a change in the levy system to permit a levy on the pollination service provided by beekeepers to crop farmers would generate significantly more funds to support R&D. This extension would directly benefit the recipients of pollination services, as well as the beekeeping industry.

ACCESS TO RESOURCES
The Executive continues to push various agencies on the issue of secure access to floral resources for our members. Unfortunately this is an ongoing battle, but one we are determined to keep fighting.

The Christmas and New Year break means that many agencies have been slower to respond over the past couple of months, but we continue to try for concert agreements that will benefit our members and provide security around access to bee sites.

2015 HONEYLAND
Preparations for Honeyland at the 2015 Sydney Easter Show are well underway, with our Show Coordinator and Show Committee working hard organising stock, promotional bags, display and volunteers.

We all know it's been a tough time for beekeepers, so I'm especially grateful to those who are donating honey, and/or their time to help in packing honey, transporting product and working on the stand this year.

However, because times are so tough, donations are understandably down and we need to spend more on honey this year, so our profit will probably be down.

The generosity and hard work from a few helps the whole Association. So if you haven't already considered it, please think about giving some of your time to help at Honeyland. And of course, any honey donations will be very gratefully accepted.

Please contact our Show Coordinator, Bruce White on 02 9634 6792 or email: blwhite@hotmail.com, if you can volunteer.

BEE WEEK FIELD DAYS & HONEY FESTIVAL
Orange Showground - 22 & 23 May 2015

Please see the Ad for Bee Week Field Days & Honey Festival on page ..... and thanks to Karla Hudson who is putting in loads of effort to organise the event. We think that it will be a great opportunity to raise awareness of the importance of bees and beekeepers, as well as having trade stands of interest to beekeepers. Volunteers are needed to help in, and it would also be great to have plenty of real beekeepers there to chat to the public.

EXECUTIVE MEETING
Our February Executive Meeting will be in Tamworth and we are looking forward to making the most of the opportunity for the Executive to meet with members in the area.

Casey Cooper
State President

FOOD SECURITY

Bruce White OAM and Dr Shona Blair (Wheen Bee Foundation) recently attended a half-day session about food security, which was hosted on February 4 by the Faculty of Veterinary Science, University of Sydney. The workshop was part of a two-day symposium, *Research In Veterinary Science*.

The food security session was very interesting, and thanks to Trevor Weatherhead (AHBIC) who had been told about the symposium by some beekeepers, who heard about it on an ABC radio program, for alerting us to this opportunity to attend.

The session had speakers with expertise in veterinary science, research, farming and agriculture, and Angus Taylor MP (Member for Hume) gave a keynote address on food security, including the projected increase in global demand for food and the role Australia could play in meeting some of that demand. Some key points from the presentations:

- Although the global population is increasing at about 1% per year, demand for food is increasing at about 3% per year (due to increasing proportion of "middle class" populations as well as population growth)
- There is a difference between having enough to eat so that you are not hungry and having enough nutritious food to be healthy – for example wheat, rice and maze are produced cheaply and in very large quantities, but a variety of fruit, vegetable and protein sources are essential for good nutrition
- Many of the productivity gains in agriculture seen over the past 50 years or so have started to slow down
- Access to enough water to grow food will become an increasing issue, nationally and globally
- Land and water are fixed assets – so we need to use them more efficiently if we are going to supply the world's increasing food demand
- Australia has much more water and land per capita than many other nations, but many traditional farming methods are inefficient and becoming ineffective, especially with the impact of climate change on the environment
- Primary producers need many more skills than they did traditionally – particularly in business management
- Accessing data in a meaningful way to help farmers in their efficiency and productivity is a challenge, but there are many working in this field and numerous opportunities
- Food output from Australia *could* grow and sustain our needs, as well as provide more food for export – but this will require new approaches to farming and food distribution
- Research has a vital role to play in ensuring food security

The presentations were very interesting and thought provoking, but one was left thinking about the important role of bees and beekeepers in helping to ensure food security - bees (nor any other pollinators) were not mentioned in any of the presentation. However, future technological advances, research outputs, different water and environmental management approaches and new marketing and business strategies could all have positive impacts on our industry.

It was apparent that the importance of honey bees is not on the radar for many, even though the beekeeping industry is well aware that the honey bee plays a crucial role in Australian agriculture. This is despite the efforts of so many in our industry to have their importance, and the significant threats they face, recognised.

Although it was disappointing that none of the presenters mentioned the importance of bees, Bruce was able to raise a point from the floor after the address from Angus Taylor, and he took the opportunity to outline the essential role of bees in food security. Bruce pointed out that honey bees where brought to Australia by the early British settlers and have become part of our landscape. He also highlighted the fact that our current horticultural system is heavily dependent on the pollination services provided by honey bees.

Although Angus didn't mention bees during his address, when Bruce brought them to his attention it was heartening that Angus acknowledged Alby Schultz had briefed him on the beekeeping industry and the issues it faces during their handover.

Attending the workshop enabled us to raise awareness of the importance of bees in food security to at least some in the agricultural research community, and we plan to use the connections we made on the day to continue to advocate for bees and the beekeeping industry.

Bruce White, OAM
Dr Shona Blair, CEO Wheen Bee Foundation

NEW MEMBERS

A warm welcome to the following new members:

Dierdre Barnes	Rosebery
Anerys Brotherton	Rosebery
Francis Farrell	Junee
Jeff Fox	Baulkham Hills
Colleen Gillham	Windsor
Mark Hall	Downer
Amanda Imrie	Leichhardt
Glenn McConnell	Glen Innes
Edward Pennay	Granville
Cherie Sevens	South Windsor
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BEEKEEPER GUILTY OF BIOSECURITY BREACHES

MEDIA RELEASE - *12 December 2014*
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A 50-year-old Buronga (NSW) man was fined a total of $6,500 and ordered to pay costs of $292 at the Mildura Magistrates Court today after pleading guilty to offences under the *Livestock Disease Control Act 1994*. No conviction was recorded.

The man pleaded guilty to four offences for breaches of the *Livestock Disease Control Act 1994* that involved exposure of diseased apiary materials to honey bees on two Victorian properties and failure to brand hives with a registered brand.

Department of Environment and Primary Industries (DEPI) Apiary Officer Daniel Martin said DEPI officers detected 69 diseased hives while conducting routine apiary inspections. "The apiaries were owned by the man and were being presented for commercial almond pollination services on properties in Iraak and Red Cliffs in August 2013," Mr Martin said.

"The hives were infected with American Foulbrood (AFB) which is a highly infectious, notifiable, bacterial brood disease that weakens and kills honey bee colonies. Honey produced from AFB infected apiaries is safe for human consumption and does not pose a health risk. "However, this disease is highly transmissible between beehives because diseased hives that have been weakened become susceptible to being robbed-out by bees from stronger hives. As a result, nearby healthy hives owned by other beekeepers who are providing professional paid pollination services are vulnerable to disease spread.

"Beekeepers that suspect the presence of AFB in their hives must notify DEPI within 12 hours. "The man was also using hives that were not correctly branded with a DEPI beekeeper registered brand. It is a legal requirement for beekeepers to brand their hives for identification and disease traceability, similar to other livestock industries such as ear tags for cattle. "Today's outcome highlights the importance of biosecurity within the honey bee industry.

"Approximately 130,000 commercial beehives are moved into the Riverina and Sunraysia areas from as far afield as Queensland, New South Wales and South Australia during the annual spring almond pollination season. It's the largest annual movement of livestock in Australia.

"This man created a major biosecurity threat to other commercial apiarists by delivering diseased hives to two separate commercial almond orchards, posing a high risk of disease transmission to healthy hives owned by responsible commercial beekeepers. "Not only was there a heightened threat to the livelihood of other beekeepers but the almond growers pay beekeepers to place hives in their orchards to pollinate the almonds.

"Honey bee almond pollination is compromised in situations like this where there are significant disease outbreaks. "If diseased honey bee colonies are too weak to fly and pollinate almond flowers this will have a direct negative impact on the yields of almond growers, thereby posing a threat to the Australian almond industry which has an approximate annual farm gate value of $300 million.

"It also illustrates the importance of ensuring the supply and protection of healthy disease-free hives for the Australian honey bee industry as well as for other honey bee pollination dependant horticulture industries. "AFB is controlled and eradicated by the containment and destruction of infected live colonies and the destruction and/or appropriate disinfection of infected hive components.

"The maximum penalty for each of these offences under the *Livestock Disease Control Act 1994* is $8,856.60."

CAPILANO HONEY

Sweetens Market Position

Eloise Keating - 30 January 2015

Australian honey maker Capilano Honey will seek to bolster its position in the local market, following the acquisition of Victorian business Chandler Honey.

Capilano announced its plans to acquire Melbourne-based Chandler Honey on Thursday, informing the Australian Securities Exchange it expects the purchase to be completed by today.

Dirk Kemp, Capilano chief financial officer and company secretary, told *SmartCompany* the value of the purchase will be revealed to the market on 9 February.

Chandler Honey's operations will be moved to Capilano's honey making facility in Maryborough in regional Victoria, and the owner of Chandler Honey will join Capilano, along with two other employees.

Kemp says the acquisition will allow Capilano to expand its operational capacity to meet greater demand for the company's honey. According to the ASX statement, Capilano expects to be able to produce an additional 1000 tonnes of honey as a result of the acquisition.

Kemp says demand for Capilano products has been increasing over the past two years in the domestic as well as international markets. "Australian honey is seen in the market as being better quality," Kemp says.

Capilano Honey started as a small family business in Queensland in 1953 and listed on the ASX in 2012. The manufacturer is now estimated to hold approximately 50% of the domestic honey market and is one of the largest honey packers in the world.

In June 2014, media mogul Kerry Stokes picked up a 12.5% stake in Capilano, after distributor Icon Brands sold down its 20.7% stake in the company. Kemp says Capilano enjoyed strong revenue growth in 2014, with the company posting revenues of $86 million for the 2014 financial year, a 19% jump on the year before. Net profit after tax for the year was $4.6 million, up 34% from $3.4 million the year before.

Capilano's focus this year will be continuing to improve its supply chain and securing and maintaining relationships with local beekeepers, says Kemp. But Kemp says the company is also continuing to "investigate" further opportunities to expand overseas. "We've just started Asian distribution and we will look at expanding that, mainly in China," he says.

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THE FROST REPORT

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INTRO TO QUEEN BEE INSEMINATION

Artificial or instrumental insemination of queen bees can provide complete control over mating. For industry purposes, the selection and crossing of queens and drones with specific characteristics using insemination techniques is an important tool for rapid stock improvement, stock maintenance and the production of breeder queens. This tool also allows breeding across continents between stock in countries which permit the import and export of honey bee semen. Australia does not permit the importation of honey bee semen at present.

Another notable technique which regularly produces near complete control over mating is the Controlled Flight Time Mating technique, perfected in Joe Horner's queen breeding operation in Rylstone, NSW. Essentially, this technique shifts queen and drone mating flights to a time of day, just on dusk in the Horner's case, at which feral drones are no longer on mating flights. In the Horner operation, this technique provides at least 85% control of matings, according to the 2009 study "Genetic Evaluation of a Novel System for Controlled Mating of the Honeybee, Apis mellifera" by Oldroyd, Oxley, Hinhumpatch and Gloag. I'll save further discussion of the Controlled Flight Time Mating technique for another day as it warrants an entire article to do it justice.

HISTORY

Whether referred to as instrumental insemination (II) or artificial insemination (AI), the procedure entails the collection of semen from one or more drones and its transfer to the oviducts of a queen with the use of an insemination instrument. The first successful AI procedure of a queen bee was demonstrated in 1926 by Dr. Lloyd Watson. This procedure was perfected in 1944 at the United States Department of Agriculture (USDA) Baton Rouge Lab by Harry Laidlaw Jr, known as "the father of honey bee genetics," with his discovery of the queen's valvefold which until then had unknowingly impeded transfer of semen into the queen's oviducts resulting in reliable, successful AI. In 1947 Otto Mackensen introduced the use of carbon dioxide (CO_2) to immobilize queens during AI which also proved to induce egg-laying sooner after insemination than without CO_2 treatment.

Australia's pioneering queen bee insemination expert was Gretchen Wheen (1929-2012) who, by the mid-1970s, had become a leading commercial supplier of queen bees for local and overseas markets. Wheen was instrumental in the establishment of the Commonwealth Honey Bee Quarantine Station at Eastern Creek, NSW, set to close in August 2015. A new honey bee quarantine facility is in construction in Mickleham, Victoria and set to open in 2015 according to a January 12, 2015 post on the Australian Government Department of Agriculture's website. Notably, Wheen and colleague Mathilde "Tilly" Kühnert, of Professor Friedrich Ruttner's Oberusel University lab in Germany, provided AI technical services for the creation and maintenance of the Western Australia and Eastern States Bee Breeding projects in the mid-1980s. Both projects were discontinued in 1992 and taken over by industry consortiums with Gretchen providing AI services. Wheen fostered collaborations with researchers in Australia and abroad, taught courses at her farm in Richmond, NSW and was a staunch advocate for the beekeeping industry.

INTRODUCTION TO AI

The purpose of artificial insemination is to control the queen's mating for a particular end. In a commercial setting the goal is to mate queens and drones with specific beneficial characteristics to yield breeder queens and drone mothers that will pass these characteristics on to subsequent generations (ie-daughters and drones).

In nature, mating is conducted outside the hive in **drone congregation areas**, which can draw hundreds to thousands of drones on mating flights from distances of 7 kilometers away or more. Virgins mate with around 12 drones on average, each drone yielding around one microliter of semen. If many managed and feral colonies of unknown origins are within flying distance of a drone congregation area, the 12 drones a virgin mates with could have origins in stock with a wide range of characteristics, not all of them beneficial to colony management and productivity. The origin of drones available to virgin queens can be controlled to some extent, by saturating areas around mating apiaries with drone mother colonies or through the use of isolated mating locations such as islands. Isolated mating is not possible for most queen breeders and saturating mating apiaries with select drones still does not yield complete control over mating. Thus, the only method of completely controlling specific crosses between drones and queens is to use artificial insemination.

In the beekeeping industry worldwide, insemination is used to breed bees with specific beneficial traits. Inseminated queens used for breeder stock as breeder queens or drone mothers also reduce the amount of variation in characteristics between daughter queens. In countries that permit the importation of bee semen, crosses between select stocks from different countries are possible with semen collected in one location used to inseminate queens in another. Artificial insemination facilitates breeding that would otherwise be impossible considering the geographical limitations of natural mating.

As a research tool at universities and government agencies, artificial insemination is used for a variety of reasons including, but not limited to, studies of inheritance and inbreeding, selection for specific traits, maintenance of breeding programs and studies of sperm migration, mortality and reproductive biology. Notably in their recent RIRDC project on interspecific matings between Apis cerana and Apis mellifera, Professor Ben Oldroyd and Dr. Emily Remnant of the University of Sydney used artificial insemination to inseminate Apis mellifera queens with semen from Apis cerana drones to examine the resulting eggs. The full project summary, published in August, 2014, can be found on the RIRDC (Rural Industries Research & Development Corporation) website.

INSTRUMENTS & EQUIPMENT

Whether for industry or research purposes, artificial insemination of queen bees is a specialist activity that requires specific equipment and precise skill that takes time to master. Ideally an artificial insemination specialist should be sought for contract work or instruction in this process, however, I know some cluey blokes from Tingha who learned from watching Sue Cobey's video "Instrumental Insemination of Honey Bee Queens" and through trial and error.

There are a range of instruments and syringes that may be used for semen collection and insemination of queen bees. Instruments in most common use in the US are:

- Schley insemination instrument and syringe
- Mackensen insemination instrument and syringe
- Latshaw insemination instrument and syringe
- Harbo syringe (large capacity)

Equipment for AI

- Insemination instrument (ie-Schley, Mackenson, Latshaw, etc), complete with stand, micromanipulators (ie-ventral hook and sting forceps or sting hook), queen backup tube, queen holder, CO_2 attachment point

- Syringe (ie-Schley, Harbo, Latshaw, etc)
    - — Saline solution (0.85% saline solution + broad spectrum antibiotic)
    - — Applicable accessories (ie-Harbo requires micro-tubing, silicone tubing, glass barrel, capillary tube, syringe tip)
- Dissecting microscope (binocular stereozoom, 10X to 20X)
- Cool light source (ie-fiber-optic)
- Carbon dioxide source
    - — Flow regulator
    - — Tubing
- Disposable syringe or pipette with bulb (to fill AI syringe with saline solution)
- 95% ethanol or methanol
- Distilled water
- Sodium hypochlorite (for soaking soiled glassware)
- Sterile tissues (for wiping syringe tip during semen collection)
- Pressure cooker or autoclave
- Queen cages
- Queen bank and/or individual nucleus colonies for AI queen introduction
- Drone cages
- Drone flight box
- Drone banks, complete with queen excluder and flexible, clear inner cover
- Queen marking kit

RESOURCES

If artificial insemination of queen bees is a tool you're interested in, just remember it's futile without good queen rearing and drone production practices and good disease management practices. If you don't have these steps down yet, NSW DPI is offering the following courses:

- **Queen Bee Breeding Course** in Richmond, NSW from March 6-8, 2015, co-taught by Doug Somerville and myself. This course suits beekeepers and people interested in entering the queen bee industry.

  More info for this course can be found here:http://www.dpi.nsw.gov.au/agriculture/profarm/courses/queen-bee-breeding

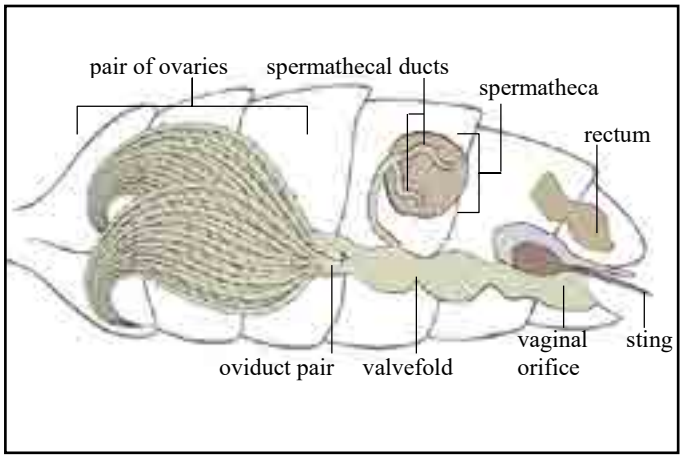
- **Online Pests and Diseases of Honey Bees Course**, available anytime, anywhere a participant has a computer and internet access. This course aims for each participant to be able to identify and manage the major domestic pests and diseases of honey bees to minimise their impact, whilst promoting awareness and surveillance for the exotic pests and diseases threatening the Australian apiary industry. This course is offered online through Tocal College, a Registered Training Organization, and is aligned to national units of competency, awarded on successful completion of the assessment tasks.

  More info for this course can be found here: http://www.dpi.nsw.gov.au/agriculture/profarm/courses/bees-pests-and-diseases-of-honey-bees-online

Recommended further reading on queen bee insemination procedures can be found online. Search for "Standard methods for instrumental insemination of Apis mellifera queens" by Susan Cobey, David Tarpy and Jerzy Woyke, an article published in the Journal of Apicultural Research in 2013.

An inseminated queen lowers her abdomen into a cell to lay an egg, 6 days after insemination.

Close up of the Schley instrument and a virgin queen pre-insemination. The virgin is held in place and given a steady, low dose of CO2 during the procedure. Her vaginal orifice is held open using a ventral hook and sting forceps.



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RESEARCH SURVEY ON BEEKEEPING

Are you a beekeeper? Then I need your help!

I'm conducting this survey about beekeeping for a research project as part of my Masters course at the University of Gastronomic Sciences in Italy. I'm totally obsessed with honey and beekeeping and want to know more!

The purpose of this research project is to better understand the relationship between beekeepers and the natural environment where they keep their hives. It's being distributed globally to gain a richness of data, and will be used as the foundation for my Masters' thesis, which will explore the importance of 'terroir' for honey.

This survey is designed for absolutely anyone who keeps bees - whether you only have one hive in your backyard and harvest honey for your family, or have hundreds of hives and sell your honey on to a larger producer.

Pretty please feel free to pass this survey on to anyone who keeps bees - the results are anonymous, and it should only take around 10 minutes to complete. I need as many respondents as possible in order to generate statically relevant results.

Please use this link: http://ow.ly/G7kUy

Alecia Wood
Ex-Sydneyside foodie journo and Youth Food Movement advocate

MEDIEVAL MEAD REVIVAL

It was the drink of choice for Vikings and medieval feasts and after a hearty revival in the United States, mead is tipped to become popular Down Under.

The ancient brew, made from fermented honey, has been called the ancestor of modern alcoholic drinks and can be served chilled, at room temperature or heated.

Thanks to boutique meaderies in the US and the popularity of the *Game of Thrones* series, mead is now seen as an alternative to wine.

Inner-west pub the *Vic On The Park Hotel* has been one of the first Sydney venues to promote the drink. Bar Manager Ben Johnson said mead was great on its own or as a base ingredient for cocktails.

2015 CONFERENCE

The NSWAA 2015 Conference will be held on Thursday 2 & Friday 3 July at the Penrith Panthers Leagues Club

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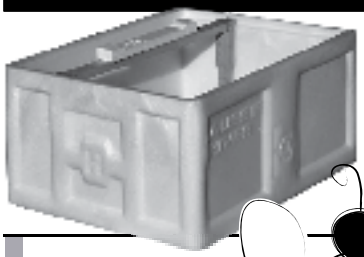

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CENTRAL TABLELANDS BRANCH NEWS

On 15 January 2015 Malcolm Porter, President of Central Tablelands Branch of NSWAA, presented Joe Tobin with a certificate of appreciation for his many years of service to Beekeepers in the Central West.

Below is a small history of Joe's involvement in the Beekeeping industry.

EC TOBIN AND SON

EC Tobin and Son was started in 1975 by Tom Tobin and his son Joe.

Prior to starting their business, being Beekeepers themselves, they started to make a few boxes and frames for their own use. Bathurst Beekeepers wanted quality made boxes and frames and by word of mouth the process began and before long they had many beekeepers requesting supplies. They designed and built new machinery to be able to manufacture on a commercial scale.

Over the years extra machinery has been added to streamline the process and to be able to make more items for the beekeeper. In the mid 1980's Joe designed and built the machinery & equipment to make the Beeswax foundation.

After Tom's retirement in 1984 and due to demand, Joe's wife Doreen started fulltime, working alongside Joe in managing & running the business.

Over the years E.C Tobin & Son has grown with the Honey industry & adapted to the new requirements of the beekeeper. Joe has worked tirelessly over the years providing quality supplies, advice, equipment repairs and innovations to make the beekeepers job a little easier. This continued until his retirement in 2014.

Joe has made many good friends in the industry, a lot of whom go back many years and has decided it is the right time to pursue other interests. The business still operates at the same premises on a smaller scale and is run by Sonia Tobin and Tom Standen. Joe can still be found around the shed.

OBE AWARDED TO JOHN DEACON

(The OBE award is given by the Branch to beekeepers over eighty!)

John's interest in bees started when as a boy he helped his father work the bees. John's father ran around 500 hives at the old settlement of Yerranderie at the head of the now Warragamba Dam in the 1940s. John would carry 60lb tins on the back of his push bike to the bee sites close to the Deacon's home. They had other sites 5 to 8 miles away.

When the honey was being produced they would use John's father's vehicle, a 1937 model Ford Ute. The Ute would carry a two frame hand extractor, bit of other bee gear like buckets and dishes for water and 20 to 30 honey tins, plus a roll of old bags to make a lean-to so they could extract the honey in it, (this was the old day's extracting shed).

While John was living in the Yerranderie valley and he didn't have to help his father with the bees, John would ride his push bike down the valley and pick peas and beans for some of the other farmers who sent there produce to the Sydney Markets. John was able to get work in the valley, when not helping with bees or picking peas or beans, he drove the local school bus run, which was an old Holden car carrying 13 or 14 local kids to school!

When the Warragamba Dam was built and filling it cut the access into the Yerranderie valley this meant everybody had to sell up and leave. John was married at this time to a young lady named Anne. John's father bought a 1957 two ton International truck, to move all the bees and furniture to Lithgow. This move out of the valley took place in 1958.

John and his father would now work the bees on weekends as John got himself a week day job at the local Holden garage in Lithgow about 1959 early 1960. John stayed at the Holden garage for over 30 years. When the garage went broke John walked away with no money after 30 years' service. At the age of 80 years John now runs around 250 hives with no sign of retirement. This is John's life given by his wife Anne.

This is a little bit that John liked about his days of beekeeping in the 1960s and 1970s, best flows were Mugga Ironbark, Yellow Box, Patterson Curse and he travelled to places like Narooma, Tamworth and Condobolin. John still has a copy of a 1934 ABK and Herald Newspaper.

When John left Yerranderie he bought the Church of England building and made the honey shed in Lithgow out of its materials. The best thing that has changed in beekeeping is the introduction of trucks and loaders. John is a third generation beekeeper on his mother's side.

Mal Porter, President
Central Tablelands Branch

John Deacon receiving his OBE from Malcolm Porter

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DOUG'S COLUMN

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

PACKAGE BEES

The trade and use of package bees began in 1912 when the first known successful shipment occurred in the USA from Alabama to Northern USA.

Package bees are, in essence, an artificial swarm containing a measured amount of bees (by weight) and a queen bee. They are used to start new colonies, or to top-up the number of bees in an existing colony. In the Australian context package bees have been associated with the exportation to several countries. Only recently has there been a demand for package bees within Australia.

A package
Package bees are sold by weight. Due to the principal markets and origin of package bees being North America, packages are historically sold by the pound. The normal choice has been for a 2, 3 or 4lb package.

Each one-pound of bees is likely to contain an average of 3,500-4,000 bees, thus a 4lb package should be equivalent to 14,000-16,000 bees. This has been the Australian market preference and will cover six full depth frames or the equivalent of a very strong nucleus colony.

The bees are placed in a 'package' or container with wire screen usually on both sides of a wooden box. Provision is made for a sugar feeder and a slot to attach a queen cage. This allows maximum ventilation for the cluster of bees while in transit.

A mated queen bee is usually placed in the package along with a container of sugar syrup. If the package is being used to top-up the populations of existing beehives, then a pheromone strip can be used within the package instead of a mated queen. The pheromone strip will be emitting queen substance to keep the resident bees in a contented condition. Without a queen or a pheromone strip, the bees can become very agitated and race around the cage.

HARVESTING PACKAGE BEES

Producing package bees
The aim is to maximise the worker bee population in a hive prior to the resident bees being shaken from the hive into a package. To achieve this it is important that the hive has a young, actively laying queen, is disease free and the colony has access to good breeding conditions.

Younger queen bees are able to sustain a larger brood nest and the colony is able to recover quicker after the colony is harvested for bees to fill packages.

Disease free is self explanatory. It is important to use colonies not showing any signs of brood disease. It is also important to have a small hive beetle control program in place to eliminate all adult beetles within the hives to be harvested of their bees.

Good breeding conditions refer to the steady supply of nectar and pollen. Pollens should be from more than one species and in sufficient quantity for the colony to store a surplus in the combs around the brood nest. A light nectar flow will stimulate the queen to continue to lay eggs at a high rate. This will in turn promote pollen foraging by the field bees.

All these variables can be actively managed by the beekeeper to maximise the number of worker bees harvested from a hive and to ensure the colony recovers reasonably quickly once the bees have been harvested.

If these conditions are followed, then it is probable that a high quality package of bees will be produced. If harvesting bees from diseased stressed colonies, or those suffering a nutrient deficiency (lack of pollen or nectar) or headed by an old queen, both the package of bees will be of poor quality and the colony from which the bees have been harvested will be slow to recover.

Preparing colonies to be shaken
The previous conditions should be considered throughout the year but particularly during the seasons when producing packages. An ideal hive unit to harvest bees is usually a double hive with a queen excluder over the brood box.

The super should not be full of honey and the colony should not be on a heavy nectar flow. If the bees are shaken off combs during a heavy nectar flow, the loose nectar in the combs will shake out and make the whole package bee harvesting event a sticky mess.

Harvesting bees
The lid is moved forward allowing for a gap of several centimetres. Smoke is applied in profuse amounts into the entrance of the hive. The bees move up through the excluder into the top super. Once it is gauged that there are sufficient bees in the top super, the super is removed and the bees in the lid are shaken into the funnel.

Shake the bees from the inside of the lid into the funnel.

The super is placed over the funnel. One frame is removed and the bees are shaken into the funnel. This frame is placed against the collection cage. Each frame is then separated and shaken into the funnel. The bees attached to the wall of the box are then bumped into the funnel.

This procedure is repeated with several hives until the collection cage contains enough bees for 3 or 4 packages. The bees within the collection cage are scooped or poured into a weighing vessel set up on a set of scales. When the desired weight of bees is reached they are poured into a prepared package container. The bees are then sealed in the package.

If the conditions are conducive to robbing then it is important to shake all the hives in an apiary. Leaving some very strong hives amongst very weak and disorientated hives may lead to the weaker hives being robbed by the stronger hives.

Package preparation
Packages are constructed in the warehouse and stapled to spacing sticks. The sugar feeders are filled with syrup at a concentration of two parts sugar to one part water, with some sponge foam pieces placed in the feeder to prevent bees from drowning. The queens are caught and caged in queen cages with no attendants.

Immediately prior to shaking the target weight of bees into the package a queen bee in there cage is placed into each package. The harvested bees are then emptied into the package and a can of syrup is placed into the package to seal the bees in the package.

Post harvesting – the package
It is important to keep the packages as cool as possible. Bees will produce a lot of heat. Flying bees are also attracted to the outside of the packages. It is very important to remove the outside bees by either vacuuming them off or hosing them off. The use of a water hose can be very helpful in removing outside bees and cooling the packages.

The packages should be transported to a cool room as soon as possible. Heat is now the single most serious issue for package bees. Excess heat will kill whole consignments of packages. This now becomes the number one most important consideration after harvesting and making up the packages until the packages are installed in their new hive. Keeping bees chilled at 5 to 6 degrees C will reduce the consumption of syrup and keep the bees clustered.

The period from harvesting bees for packages until they are installed in their new hive should be kept to an absolute minimum. If conditions are favourable, then one week is achievable. Packages will store better in a cool dark location. The demise of the package of bees is easily recognised by the accumulation of dead bees on the base of the package.

If the harvested bees had a full tummy of sugar syrup or nectar at harvest time they will not initially consume a lot of the provided sugar syrup. Depending on the size of the package of bees and the time the bees are likely to be in the package during transit, the volume of syrup will vary. Generally a third of a litre is sufficient for the domestic market and two thirds of a litre for the export markets. It is important to check the volume of syrup prior to the departure of the packages to ensure that there is adequate syrup for the bees to last the journey. Once the syrup has been fully consumed you can expect the bees to live for a day or two before an increase in mortality is observed.

Post harvest – the harvested beehive
Assuming that the colony is disease free, ensure that measures to control small hive beetles are in place. The colony is now dominated by older field bees and newly hatching brood. While some of the older field bees will revert to some nurse bee duties, the colony may take two or three weeks to recover. This is dependent on the amount of brood in the hive prior to the shaking event.

The removal of adult bees in this fashion may also predispose a colony to European foulbrood disease – a bacterial disease of developing brood. Consideration should be made to monitor for this disease in the few months after shaking and, if observed all the colonies in the apiary should be treated with the antibiotic oxytetracycline.

It is also very important to monitor the nutritional status of the colonies. If nectar is in short supply, consider supplementary feeding with sugar syrup. Likewise, if pollen is in short supply consider providing a pollen supplement.

The actions of harvesting bees from hives will remove between 50 to 70% of the resident bees. Condense the double hive into a single if the remaining resident bees are unable to cover the frames in the top box. A colony will recover more quickly as a single unit than if left as a double. A single unit will be better able to defend itself against small hive beetles.

INSTALLING PACKAGE BEES
Prior to the anticipated arrival of the package bees it is important to prepare the bee boxes that they are to be introduced into. Drifting of bees from packages during the installing process can be a problem. It is best to install packages in an apiary without existing established colonies present. A dedicated apiary to install packages should be considered.

The prepared hive should contain a full complement of frames. If possible all the frames should have fully drawn comb, with one frame of capped honey and a frame containing pollen. This may not be achievable. In this case it is important to have a sugar feeder attached to the hive in one form or the other, e.g. frame feeder, top feeder or front feeder. It is unwise to not feed a newly installed package even if there are good flowering conditions producing nectar and pollen in abundance.

Poor weather at or soon after installation of the package may mean that the bees become very stressed and could predispose them to disease. They may also be restricted in their development to the point where they don't recover satisfactorily to build up to a viable population to deal with events such as winter.

If the package bees are being installed onto foundation or dry combs it is important to provide colonies with a constant supply of sugar syrup. Preferably this would be a few litres 2 or 3 times per week until they no longer feel the need to consume the syrup. Once a colony is on a satisfactory nectar flow and there are sufficient field bees in a hive, the colony will show a preference for natural nectar rather than the sugar syrup provided.

The package should be emptied into the prepared hive in the late afternoon or early evening to prevent drift. Prior to shaking the package into the hive, remove the queen cage from the package and check that she is alive. Remove the plug to the queen cage and place the cage with the cluster of bees.

Another method is to place the package in the hive with the required number of frames removed. Place the queen cage with a few bees attached on top of the frames next to the package. The bees in the package will move at their own pace out of the package and cluster over the queen and the adjacent frames. The following day remove the package container and shake any remaining bees into the hive replacing the frames. It is extremely important to provide sugar syrup when installing package bees to ensure a high success rate.

If the bees in the package are young, then there should not be a big drop in population before the new generation of bees starts to hatch after three weeks. It may take four to five weeks for the colony population to stabilise and begin expanding.

Topping-up existing colonies
Although not a management strategy commonly practised within Australia, it is relatively common in the United States. Prior to almond pollination in February each year beekeepers inspect their hives in January to ascertain the strength of each beehive. Colonies not reaching the required eight frame standard to meet almond pollination contracts will either not be taken to almonds or could be topped-up with bees from package bees.

This topping-up may mean the difference between being paid for a pollination contracted service or missing out on this fee.

As the bees are young and full of sugar syrup the bees are readily accepted into the under-strength hive.

HISTORY OF PACKAGES
As stated in the introduction, the trade in packages began with the successful shipment of bees from Alabama in southern USA to the north of the USA in 1912. There used to be a very large trade in package bees from the southern states of the USA into Canada. However, this practice was shut down for biosecurity reasons.

In Australia Norman Rice, a queen breeder based in Queensland, successfully shipped package bees to England in 1963. Norman later sent packages to Hong Kong, Malaysia, Libya and Pakistan. This apparently was never a large component of his business, which was primarily focused on producing queen bees.

Warren Taylor (Australian Queen Bee Exporters) air freighted package bees to Germany in April 1981 followed by Terry Brown. Terry air freighted a pallet of packages to Pakistan in 1983 as part of a United Nations aid project. Both later entered the Canadian market, along with several others.

Australian trade in package bees was in full swing in 1990 with two and three pound packages exported in April. South Korea became a major market for Australian package bees in the late 1980s and early 1990s with 30,000 packages exported in 1992. This trade was stopped in 2002 due to the discovery of small hive beetles in Sydney.

Throughout the 1980s and 1990s Australian package bees were exported to a range of countries including Saudi Arabia, Qatar, Jordan, United Arab Emirates, Pakistan, French Polynesia, Malaysia, Japan and the European Union. Once small hive beetles were found in the Sydney basin in 2002 most importing countries closed the market for imported Australian package bees.

The market for package bees opened in the USA in 2005. By 2007, more than 30,000 Australian packages were being exported to the USA with no let-up in demand from the USA. This market went well for a few years and was earlier than the Canadian market for Australian beekeepers, requiring package bees in December, January and February. This was more attractive to Australia, as in April beehives are beginning to close down for winter in the south of the country which is a problem when shaking hives for the Canadian market. The USA market closed in 2009/2010 due to biosecurity concerns expressed in the USA in relation to the Asian bee incursion in Cairns, Queensland. At the time there were also accusations that Australian package bees were a possible cause of the Colony Collapse Disorder sweeping the American beekeeping industry. This was later proven not to be the case, but access to the market did not re-open.

It was common for someone to travel on the same plane flights as the packages so as to monitor their condition and trouble shoot any problems that may arise during the journey.

Problems with international trade

- Negotiations with some countries for access for Australian package bees have been met with stiff domestic resistance due to 'fear' of biosecurity risks. This can take years to resolve and in some cases may never be resolved, as government priorities with negotiations on various commodities change.

- Transportation losses can be very high to extreme. No matter how good the preparation of the package bee shipment, ultimately the welfare of the bees is in the hands of the airlines until they are received at their destination by the package bee agent or beekeeper.

- Delays in departures and delays in transit may mean no circulated cool air in the hold of a plane and the bees over heating. Over heating on the plane, while less common can still be a concern. Many beekeepers place temperature recorders into each shipment of packages to gauge what temperatures have been reached at what section of the shipping process.

- International exchange rates fluctuate. When an order to supply package bees is negotiated the expenditure in packages, preparation of bees, mating of queens, has to begin months before the anticipated shipment date. Allowances should be made for fluctuating exchange rates.

- There are only so many flights per week to various destinations around the world that are able to freight package bees safely. Also, the experience of different airlines will vary in transporting such a fragile cargo. Booking freight space well ahead of time is necessary to be able to export package bees.

CONSIDERATIONS

The demand for package bees from Australia for various export markets has fluctuated widely, dependent on a range of factors. Primarily, biosecurity risks are used legitimately and as a trade barrier to the import of Australian package bees. Steps to consider if contemplating the production of package bees as part of your business are:

1. Identify potential markets. Is there a demand at a time of year when you can adequately supply? Is the cost and risk of providing package bees going to be profitable?

2. Organise the bees – do you anticipate you will have enough bees to fill all the package bee orders? Will you be able to produce or buy enough queen bees sufficient for one per package when required? What type of package cage does the client want?

3. Producing package bees is a highly labour intensive enterprise. Queen bees have to be produced, the hives from which the packages are harvested need to be managed well, the packages and feeder have to be prepared. At the time of shaking, many hands are needed to shake the bees from the hives, measure into the packages and transport to the holding cool room. This labour needs to be skilled in the component of the operation that they are undertaking.

4. Transport from the apiary to the storage cool room needs to happen in a timely manner, transport to the airport also needs to be timely, preferably during evening hours when conditions are cooler. The packages have to be arranged on the transport pallets in a pattern that allow maximum ventilation. They will need to be secured and netted according to airline requirements. All external bees will need to be removed to satisfy airline requirements.

5. Airfreight will need to be organised. Historically this is one of the biggest costs of supplying package bees to the international market. Airfreight space is limited and some airlines are reluctant to ship live bees.

6. What happens at the other end? If you are dealing with an agent or directly with a beekeeper they will need to be kept informed of all the preparations at the Australian end of the shipment.

7. Has the relevant documentation for importing into the specific country been met? Each country will vary in relation to what biosecurity conditions need to be met. Importing conditions are set by the importing country, not Australia. To find out what they are, contact the buyer or enquirer in the country of destination and ask them to approach their own authorities to find out what inspections, tests and documents are required.

Health certificate requirements, by country, for the export of live bees from Australia can be found on the Federal Government Department of Agriculture website www.daff.gov.au/micor/live-animals/

You will need to contact the government inspection agency within Australia, usually a State Primary Industry Department Inspector with designated responsibilities to carry out export inspections on behalf of the Federal government agencies.

There is going to be a charge for any inspections and tests conducted to meet the importing countries' requirements.

Note 1: Provide labour to the inspector by opening and closing the hives they wish to inspect, thus reducing the chargeable time they are in your apiaries.

Note 2: Give the inspector plenty of notice of your intended inspection date requirements so they can schedule your inspection around their other duties.

Inspection and test requirements may vary from one country to another and even from year to year. This is your responsibility to keep up-to-date with, not the inspector.

DOMESTIC MARKET

There is a growing demand to supply packages to the domestic market. This can work in two ways. Either the bees are prepared and packaged into the containers described, or the bees are shaken directly into your own hives.

The cost of the package container and the extra job of shaking the bees into the hives will be eliminated if the bees are shaken directly into the hive to be populated. It is important to keep the bees closed in the hive overnight to allow them to settle down and reduce drift. Supplying sugar syrup is just as important with this method as with all methods of package bee installation.

Acknowledgements: Warren Taylor and Terry Brown for supplying information for the article and reviewing the notes and Annette Somerville for editing the article.

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WORLD NEWS

More Than 100 Businesses Call On White House to Protect Bees from Pesticides

Katie Valentine BBC - *14 January 2015*

More than 100 businesses, many of them food companies that depend heavily on pollinators for their products, sent a letter to the White House and multiple agencies, urging the Environmental Protection Agency to protect pollinators by halting the use of certain pesticides.

Representatives from 118 businesses including the owners of Clif Bar and Nature Path and the CEOs of Stonyfield and organic food company Amy signed the letter, which calls on the EPA to immediately suspend its registration of neonicotinoids, a class of pesticides which have been linked to bee declines by at least 30 studies. Neonics are used on a variety of US crops, including corn, soybeans, oranges, and leafy greens. They've been found to affect the nervous system of honeybees, with studies finding that exposure to neonics can cause honeybees to forget what food smells like and can create short and long-term memory loss in bees.

Our businesses are deeply concerned about the continued and unsustainable loss of bees and other essential pollinator populations and urge that significant action be taken now to address the threats they face from pesticides and other stressors threatening their survival, the companies write in the letter. Bee losses have a ripple effect across the entire economy, and in many cases, affect our bottom-line.

Last year, a federal report found that fewer managed honeybees died during winter 2013 than during winter 2012, but scientists say bees are still in trouble: as one entomologist told the New York Times last May, the winter 2013 bee numbers show bee losses have gone from horrible to bad. Much of this decline has been blamed on Colony Collapse Disorder, a phenomenon in which adult bees in a colony disappear from their hives, and which beekeepers have been experiencing since 2006.

As the companies in the letter state, bee losses are bad news for US crops and for companies who depend on them. One-third of all agricultural output in the US is dependent on some sort of pollination, and some key crops such as almonds and squash depend heavily on bees in particular. But the companies write that they are also concerned about the importance of bees to the overall health of the environment.

We are gravely concerned that it neonicotinoids continue to be allowed into our environment at current rates, this practice will have devastating impacts on our food supply, ecosystems and economic wellbeing, the letter states.

The Obama administration has taken steps in recent years to protect the health of honeybees and other pollinators. June, the Obama administration issued an executive order that created a Pollinator Health Task Force. About a month later, the Fish and Wildlife Service announced that it would phase out neonics in wildlife refuges in certain parts of the country. In February of last year, the USDA announced it was investing $3 million into a program that pays farmers in the Midwest to make their farms more bee-friendly by doing things like planting alfalfa as a cover crop.

The food companies praised these actions as good first steps, but said more needs to be done to protect pollinators in the US.

The businesses aren't the first to call for a ban or suspension of neonics. Last October, 60 members of Congress sent a letter to EPA Head Gina McCarthy, urging her agency to restrict or suspend the use of neonics on bee-attractive crops. The letter also calls on the EPA to stop and consider neonicotinoids impacts on pollinator species before registering new neonic pesticides, and states that the agency should restrict the use of neonics in commercial pesticides.

The US may not have taken steps to ban neonics, but other countries and cities have. The European Union placed a ban on neonics in 2013, and in September, Seattle banned the use of neonics within city limits. Eugene, Oregon also voted to ban neonics last year.

IT'S A ROYAL BEE-TANIC GARDEN!

Bees at the Royal Botanic Garden, Sydney are producing consistent supplies of honey despite honey supplies dwindling around Australia due to the drought in regional areas.

Jimmy Turner, Director of Horticultural Operations at the Royal Botanic Gardens said the Garden's bees have enjoyed an abundance of colourful and delicious flowers over spring and summer, resulting in delicious honey that is for sale in the Garden Shop.

"We've revitalised the Garden and introduced more flowers in 2014 and the herb garden is another great source for the bees. The abundance of flowering plants makes for sensational tasting honey." Mr Turner said.

"The herb garden is a popular stop-off for bees and one of their classic favourites is an Echium. This ornamental is a non-invasive perennial from the Canary Islands and is related to Paterson's Curse which bees also forage for around NSW," he said.

The honey was harvested during spring and early summer from five beehives overseen by Doug Purdie, Founding Director of Urban Beehive.

"There's around 60,000-80,000 bees in the five bee hives at the Garden. When you consider each bee makes a quarter of a teaspoon of honey and they only live for about five weeks, they certainly earn their reputation as *busy bees*," Mr Purdie said.

"I expect to harvest honey at Gardens, every three weeks until the end of summer/early autumn. Each harvest produces 350 jars honey."

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LETTER TO THE EDITOR

THE AUSTRALIAN HONEY BEE INDUSTRY
"BIOSECURITY CODE OF PRACTICE"

I congratulate AHBIC on the work they have done and their desire to protect the Australian Beekeeping Industry.

But be careful in what you wish for!

Victoria has spent years getting rid of red tape to regain access to public lands we should learn from that.

Our prime goal should be educational not enforcement of a set of goals, however good they maybe.

Many beekeepers are just too tired after hours of travelling and attending to beehives to make the time for recording and paper work, if they are forced to, they will find ways around it and fudge the figures.

We don't need to put extra pressures on individual beekeepers which may lead to depression and or suicide.

(a) Due to climatic conditions places like Tasmania and parts of Victoria will need to continue to use antibiotics to control EFB and or AFB in certain circumstances.
(b) A compulsory barrier system proposed will definitely not be practical for some but a very good option for others
(c) Having experienced firsthand the misuse of power invested in a beekeeper organisation, corruption in a government body, and observed the dubious use of the court system for enforcement by apiary officers, I say again, be careful what you wish for!
(d) It can be extremely difficult to get employees to fill in paper work, limit the paperwork to what is required by the owner not some state regulator.
(e) Give away your freedom and you will never get it back!

Our Industry
If we say compare our industry to a Bull (which is unpredictable) you want it to go in a certain direction for its own good, you place a small ring in its nose and gently lead it in the direction you want it to go, not grasp it by the tail and put a noose around its neck to make it obey!

Taking away the industry's freedom, forcing it to fit a mould however good won't work for some which means many are going to break the rules.

The main reason for a biosecurity approach to develop a "Code of Practice" seems to be the problem of AFB in some areas of Australia, so let's focus on that for now.

Old time beekeepers will remember that in America there was a beekeeper that only bred from bees that showed no broad disease and was successful in doing so without the use of antibiotics, what put some beekeepers off the system was that he bred the cross breeds or bees that were not gentle to handle.

I believe what was behind this systems success was hygienic behaviour of bees which we know a lot more about now.

Our industry paid my wages to research to find out what degree of hygienic behaviour there was in Australian bee populations about 16 years ago, since then some beekeepers in Australia have a small degree lifted the percentage of hygienic behaviour occurring in the Australian bee population but not to the degree to control outbreaks of brood diseases.

Solution
If we as an industry Australia wide put in pace "A code of Practice" to lift the degree of hygienic behaviour of all our lines of bees then we will minimise our brood disease problem in a gentle and practical way over a periods of a few years.

The problem we have now is that some hives do not have an effective level of hygienic behaviour, if we can raise this level to a level where most of our hives are uncapping dead diseased brood before they can reinfect other cells that is great.

To be realistic I believe if the bees can get rid of dead brood with in four days we will have made a great leap forward in eliminating brood disease in individual hives.

Of course the aim is to have all dead or diseased brood removed with in a 24 – 48 hour period to be highly hygienic, you would only breed from these bees to lift the level of hygienic behaviour.

Industry Option
To put it bluntly I believe the industry has two options, deal with the root cause of brood disease, e.g. the inability of many hives to deal with brood diseases as at present, or deal with the symptoms and go down the path of heavy handed regulations to try and control brook diseases.

Proposed code of Practice (Plan B)

Implementation
1. Make it compulsory to test all the Breeder Queens for highly hygienic behaviour (the ring in the bull's nose) and record the results on paper for audit purposes, this should apply to specialist beekeepers, and Queen bee breeders that sell queens.
2. Make it compulsory for Queen Producers that advertise to state whether the queen supplied is from hygienic breeder queens and if they are open mated to drones from Queens that are highly hygienic.
3. Allow queen breeders to sell queen bees bread from non-hygienic lines or breeder queens, so they can maintain bees that are bred for other characteristics which are extremely important.
4. I am told that dry ice method of testing for hygienic behaviour may be the most practical and safer method testing, other methods can be taught where few hives need testing.
5. All other concerns regarding Varroa and possibly other pest and diseases identification should be available in small booklets sent out on registration as a beekeeper with all the normal rules and regulations to be compliant with to keep our industry safer.

I suggest that a different set of questions be set out after the State Conferences after looking at a plan B option.

Lowie vander Woude
Tasmanian Rainforest Honeycomb
Phone: 03 6437 2817

SICK BEES

Colony Collapse Revisited
PART 18F - PESTICIDES

by Randy Oliver - ScientificBeekeeping.com

As long as I've been keeping bees, one of our worst fears has been that we might suffer a serious pesticide kill. Pesticides (especially insecticides) have always been, and will continue to be, a problem for bees and beekeepers.

Jim Doan of New York hadn't experienced a serious pesticide kill in 25 years of keeping bees in corn/soy/alfalfa farmland. But when he approached one of his yards last spring, he smelled the stench of dead bees. What he saw made him sick to the stomach—piles of dead and rotting bees in front of every hive!

Jim related to me that he called his state's Department of Conservation to investigate the kill, to no avail. So he contacted his State Apiarist, who sent out an inspector a couple of days later to take samples, which then languished in a refrigerator until at Jim's request they were sent to Dr. Maryann Frazier, who in turn sent them to the USDA lab for analysis.

Although pesticide residues were found, no investigation was done. No applicator was reprimanded, and no fine imposed. And Jim's losses weren't covered by either his insurance policy or by ELAP [1].

Jim's disaster was hardly an isolated case. I've spoken with a number of beekeepers who have suffered recent pesticide kills. Dave Shenefield's bees were working white clover in Indiana at corn planting time. A farmer drilled treated corn seed directly into a field of flowering clover without first burning the weeds off with herbicide. The planting dust fell directly onto the blossoms being worked by the bees, poisoning his colonies as the foragers returned covered with toxic dust.

Darren Cox's bees in Utah get hit regularly by applications of pyrethroids or carbamates onto flowering alfalfa hay. These applications done are despite label restrictions that clearly state:

"This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area."

Darren related to me a scenario: an aerial applicator, under a contract arranged perhaps two weeks earlier, loads up with insecticide, and flies 50 miles to treat the field. But when he gets there, he's surprised to see that the alfalfa is purple with bloom. What's he to do—turn around and unload, or just go ahead and spray anyway, knowing that such an action would be in violation of the label. But this is Utah, where the local primacy partner tends to turn its head to pesticide violations (Fig.1). You can guess the rest--such unnecessary and preventable bee kills frustrate Darren to no end!

I could go on and on, beekeeper after beekeeper. What I hear is that some states are better at others at enforcing pesticide regulations—it's tough to be a beekeeper in those states that aren't doing their job! To make things worse, beekeepers are often justifiably hesitant to pursue investigation, since in a number of states, complaining beekeepers have been fined for having illegal miticide residues in their hives! And if a beekeeper raises too much of a stink he could become persona non grata to the local landowners and lose his locations.

Figure 1: A typical insecticide kill in Utah. Simple timely communication between the grower and the applicator as to the stage of bloom could prevent many such kills, as the applicator could then make more appropriate product application choices. Photo courtesy: Jared Taylor.

Farmers and applicators could often easily prevent bee kills by simply making sure that they spray before or after a crop comes into bloom, or by spraying after dusk with a product having a short residual toxicity, or by using a less bee-toxic product that is labeled for application during bloom. Such practices would eliminate a large proportion of bee kills, yet some farmers and applicators just don't give a dam, and worst of all, get away with illegal applications (scofflaw applicators may consider any fines levied for pesticide misapplication as a minor business cost)!

What bothers beekeepers most is the unfairness of it. Ranchers (even of alpacas, reindeer, or emus) receive government benefits for livestock losses due to fire or severe weather [2], and beekeepers may be eligible for benefits for colony losses if they jump through the hoops of ELAP [3]. But neither of those programs cover losses due to pesticide application--either legal or in violation of the law.

Think about it--if someone poisoned a herd of cattle with pesticide overspray, it would make the news! You could damn well bet that the incident would be investigated and the applicator fined, and the cattleman would sue for damages via civil action. But this is generally not the case if your livestock are honey bees. Few damaged beekeepers receive any compensation at all for their losses.

Now I don't want to give the impression that the pesticide situation is dire for all beekeepers. As I pointed out in a previous article [4], many beekeepers in agricultural areas have little or no problem with pesticides. And many commercial beekeepers simply shrug off the occasional bee kill as a cost of getting good locations in agricultural areas. However, in some areas of intensive agriculture, those commercial beekeepers who provide the bulk of pollination services tell me that pesticide issues are their major problem.

A BIT OF HISTORY

In order to understand the run up to our current situation, it is helpful to read the engaging "Report on the Beekeeper Indemnity Payment Program" (which was in effect from 1967−1980) [5]. I'll share a few excerpts:

During the mid-1940's, [pesticide] damage subsided as farmers shifted from the use of arsenicals to DDT which is less toxic to bees. However, by the late 1960's, use of DDT was decreased sharply because of insect tolerance to the poison. Finally, use of DDT and other chlorinated hydrocarbons was banned because of environmental concerns. In most cases, the highly toxic [organo] phosphates and carbamates were used in place of the banned sprays. This increased the problem of bee loss to the point of disaster for many beekeepers…

Partial colony losses are not always easy to detect…pesticides may weaken colonies to such a point that they do not survive the winter. This type of loss is often ascribed to winterkill rather than pesticides. Further, this loss may be extended to the replacement bees placed in contaminated equipment the next season. Often, not all losses are discovered soon enough after the chemical application to determine the exact cause of death.

Investigatory clue: these records of the field experiences of beekeepers *prior to varroa* are important to keep in mind, notably that there were "sublethal effects" from the pesticides that caused later winter mortality. I hear the exact same complaints from beekeepers in agricultural areas today. Clearly, varroa and beekeeper-applied miticides have added to the stress upon bee colonies, but elevated winter mortality due to pesticide exposure was the norm prior to the introduction of varroa.

Colony losses due to pesticides were severe in several states during the 1960's. There was a "*sharp decline in pesticide losses*" in California during the early '70's due to the state imposing "*strict control of spray application*"—only 54,000 colonies were killed in 1974, compared to 89,000 in 1970 (an improvement, but hardly cause for celebration). But then in the mid 1970's, encapsulated insecticides (Penncap-M) were brought to market, again causing devastating losses when foragers dusted with the time-release particles returned to the hive and stored them in the beebread.

During June 1976, selected beekeepers in California and Washington were contacted to discuss the pesticide situation… Beekeepers in Washington report that there are no safe locations for bee yards. One beekeeper said, "No matter where I place my bees in the Yakima Valley, they will be sprayed at least once within ten days." A beekeeper in the San Joaquin Valley of California described his efforts to protect his apiaries as "playing musical chairs with 40 loads of bees…." Several beekeepers said that even if they did move their colonies to another location, it could be sprayed the next day.

Practical application: I hear exactly the same words today from commercial operators. We have made great progress with pesticides since the 1960's, but still not enough!

Beekeepers in Arizona, California, and Washington accounted for a large proportion of claims because they lacked access to "safe" forage areas (these were the early days of using forklifts in bee operations, and moving bees was hard work). It was not unusual for large beekeepers to suffer serious pesticide damage to half their hives each year, and they would likely have been unable to stay in business without governmental help (Fig. 2).

For nearly a decade, the Indemnity Program compensated beekeepers for pesticide losses. Those in only eight states filed the bulk of claims. As today, a small percentage of commercial

Figure 2: Back when the Agricultural Stabilization and Conservation Service kept records of reported bee kills for indemnification purposes (not all kills were reported), it was easy to see in which states pesticide applications were a serious problem. In recent years bee kills have not been tracked by any agency. Map from Erickson & Erickson 1983 [6].

beekeepers control the vast majority of colonies, and provide most pollination services. Well less than 1% of beekeepers in the country filed claims in any one year. By contrast, over 90% of the Arizona beekeepers in the program filed claims— not surprising due to the frequent spraying of the vast acreage of cotton suffering from a serious infestation by pink bollworm in the mid 1960's [7], and the lack of alternative non-agricultural forage in that dry state.

The largest payment to a single beekeeper (name and state not specified) was $225,400 in 1972 (that would be $1 million in today's dollars), and he filed for $228,000 two years later. You can imagine how this might not have set well with some budget-conscious congressmen!

And of course some crafty beekeepers learned to work the system:

On the other hand, some commercial beekeepers contend the indemnity payments have permitted, and in some cases encouraged, the survival of marginal beekeeping operations. The "marginal manager," in this context, was characterized as any beekeeper who had become dependent upon indemnity payments as a source of income.

Those alleged "marginal beekeepers" reportedly left their hives in areas that they knew would be sprayed, and managed their colonies only enough to keep them barely alive so as to be able to collect more payments the next year (or kept collecting payments on deadouts). These fraudulent practices also did not play well to the program overseers.

The study also looked at the profitability of beekeeping; I found one of the tables to be of particular interest (Fig. 3):

It is instructive that the analysts were aware of the cost to the beekeeper of pesticides:

This analysis shows that beekeeping income is affected most by severely damaged and destroyed colonies. Severely damaged colonies may require 6-8 weeks to recover colony strength. If the damage occurs during a major honey flow, the field force will be greatly reduced and honey yields could be lowered 60 percent or more. Severe damage in late summer may weaken a colony preparing for winter and increase the chances for significant winter kill…Beekeepers estimate it takes about one year for a destroyed colony to regain its income earning potential.

Table 24.--Income and expenditures of selected U.S. beekeepers, by State or area, 1971-75 average

State or area	Income				Total beekeeping income	Total beekeeping expense 1/	Net beekeeping profit or (loss) before income taxes	
	Honey and beeswax	Package bees and queens	Pollination fees	Other income			with indemnity payments	without indemnity payments
	Dollars per colony				Dollars per colony		Dollars per colony	
Arizona	14.05	0.84	2.50	11.02	28.41	25.23	3.18	(7.67)
California	25.86	0.25	13.30	2.89	42.30	35.37	6.93	5.49
Florida	63.77	----	0.28	0.02	64.07	62.64	1.43	1.41
Georgia	23.28	0.92	----	1.24	25.44	16.52	8.92	8.58
Idaho	18.84	0.02	0.70	1.05	20.61	16.85	3.76	2.71
Texas	24.58	15.59	0.55	0.24	40.96	33.20	7.76	7.52
Oregon and Washington	25.18	0.01	10.60	6.91	42.70	36.81	5.89	(0.81)

Figure 3: You can roughly adjust these figures into today's dollars by multiplying them by five. What surprises me is that despite it being painfully costly to maintain colonies today in California (the annual expense being about $190) [8], the profit margin is substantially higher now than it was back then--not because of honey (since honey prices have only kept pace with inflation [9], but rather due to much higher pollination rates in almonds. Also of interest is that in those days beekeepers spent next to nothing on feeding syrup and pollen supplement that isn't even mentioned!

The authors conclude that without the indemnity payments, "*farmers seeking pollination services would have to pay substantially higher rental fees to obtain bees."* Congress decided to pass that cost onto the farmers anyway, and terminated the indemnity program in 1980 (leaving some beekeepers with still-unpaid IOU's). Today the almond growers bear the brunt of those higher rental fees; the huge number of colonies produced to meet the demand for high-paying almond pollination ensures that there are plenty of strong hives available for other crops afterwards.

Colonies generally come out of almonds in better shape then when they went in. This is not true for a number of other crops. The combination of poor forage and pesticides in several crops can weaken colonies to the extent that they don't survive the season.

Allow me to close with some prescient conclusions from the report:

Unless Federal and State governments act ot regulate and caution applicators of toxic pesticides, colony damage will continue to be a major problem for beekeepers. However, most government officials emphasize that farmers and spray applicators are already confronted with enough regulations…the current development of stronger and longer-lasting pesticides… is creating an environment entirely unsuitable for honey bees in many parts of the U.S. These areas will find it harder to maintain the present level of bee population regardless of an Indemnity Program or higher honey and pollination prices.

Remember that the above words were written prior to the invasion of the tracheal mite, the varroa mite, *Nosema ceranae*, or the Small Hive Beetle—beekeeping hasn't gotten any easier since their arrival!

Practical application: beekeeping in agricultural settings has always been a tough way to make a living. Fortunately, many beekeepers tell me that things have gotten better in their regions. But in some areas of intensive pesticide application, it's hard to keep a hive alive from one year to the next.

NAILING DOWN THE GUILTY PARTY

This spring my bee operation suffered from a case of Sudden Forklift Collapse (Figure 4).

Figure 4: Early this spring I suffered from a case of Sudden Forklift Collapse. This was no "sublethal effect" and did not go unnoticed! In a forklift kill like this, it didn't take Sherlock Holmes to determine that the cause of death was due to a falling oak tree. If only the causes of pesticide kills were so easy to pin down!

In my case of Sudden Forklift Collapse, the cause was evident. Such is often not the case with pesticide kills. You may not even see any dead bees if the field force is poisoned in the field and never makes it back to the hive. Perhaps (as in the case of planting dust) you only see a handful of young bees and drones dying at the landing board. Or maybe the brood turns spotty. If the pesticide disorients the foragers, you may wonder why you didn't get the normal honey crop. Or maybe there is some sublethal effect from which the colony simply "slows down" for a few months, or doesn't make it through the winter.

In any of those cases, it may be difficult, if not impossible, to nail down the culprit. You don't know where your bees were foraging, and any pesticide application within a 3-mile radius is suspect. You may not immediately recognize that there was a pesticide problem at all, so any residues could be degraded or

washed off by rain by the time you think to have the dead bees or beebread tested. And even if you happen to visit the yard immediately after the kill, good luck in getting an understaffed and untrained state or county agency to quickly come out and properly collect and freeze a good fresh sample. And even then the analytical tests cost so darned much!

Action item: aggrieved beekeepers often have VERY STRONG FEELINGS! However, in order to change pesticide regulations, the EPA needs incontrovertible evidence that *a certain pesticide used according to label restrictions* caused adverse effects to honey bees. We need any and all beekeepers who suffer from substantial pesticide kills to file an "incident report." Such a report is most effective if it contains a photographic record, documentation that rules out other plausible causes for the dead bees (e.g., tracheal mites or starvation due to unusual weather or forage conditions), and chemical analysis of samples of bees and beebread, properly taken by a state agent. If your local primacy partner is unable or unwilling to help, you may report directly to http://www.npic.orst.edu/eco or beekill@epa.gov.

One would think that solving Jim Doan's kill would have been straightforward, since there were fresh piles of dead bees in front of the hives. He hadn't previously experienced serious kills in those yards, so something different had happened. There was no apparent change in plantings this year, but with commodity prices at an all-time high, a farmer might have felt that it was worthwhile to apply more or different insecticides as precautionary "risk management." Surely it would be easy to find incriminatingly-high levels of the offending pesticide in the dead bees or combs.

According to Jim, due to unfamiliarity with the investigation of pesticide kills, the state inspector collected less than an optimal amount of bees for pesticide analysis.

Two samples were later sent off to the USDA lab (the cost of analysis was split between Jim and Project Apism)- results below (Fig. 5).

		Pollen from comb	Dead bees
		2012-035	2012-036
	Internal Lab ID	12CCD818	12CCD819
Detections (ppb)	LIMS ID	AJ35537	AJ35538
Clothianidin		5.2	1.6
Cyprodinil		9.4	31.4
Ethofumesate		N.D.	5.2
Fenbuconazole		5.5	N.D.
Methoxyfenozide		3.7	N.D.
Thiacloprid		5.2	N.D.
Phosmet		399	N.D.
Captan		N.D.	1290
Cyhalothryin		N.D.	6.8

F*igure 5: Analysis report of the two samples from Jim Doan's spring bee kill (column headings added).*

OK, so now Jim had a report. But what did it tell him? As for the dead bees, the 1.6 ppb* of clothianidin insecticide is far too low to have caused bee mortality (1.6 ppb = 0.16 ng/bee; the LD_{50} for clothianidin lies in the range of 22-44 ng/bee).

* To help with the math, LD_{50} = median lethal dose; 1 ppb = 1 part per billion = 1 µg/kg = 1 ng/g; µg = microgram (one millionth); ng = nanogram (one billionth); a bee weighs about a tenth of a gram, so for every 10 ppb of residues in a sample of dead bees, any bee *on average* would contain 1 ng/bee.

So how about the high dose of Captan fungicide? As best I can tell from the literature, "Studies on the honeybee using technical Captan fungicide indicate that the LD50 is greater than 10 µg a.i./bee, and that there is 9.8% mortality at 215 µg a.i./bee." So let's do the math: 1290 ppb = 129 ng/bee, or 0.129 µg/bee - so again, it would be hard to make a case that this chemical was responsible for the obvious pile of dead bees.
Maybe the analysis of the pollen sample from the comb might help. I have no idea as to how it was taken, which can make a huge difference (Fig. 6).

Figure 6: These are plugs of beebread that I pulled from a brood frame. Note the layering of the different species of pollen. If a colony suffers from a pesticide kill, any traces of the responsible pesticide residue may only be in the topmost layer of pollen. If the state agent who takes the beebread sample scoops all the way to the midrib, he may dilute the offending pesticide by a factor of 10 or more.

The one pollen sample from the one comb from one colony (get my point?) in Jim's affected apiary contained 399 ppb of the organophosphate insecticide Phosmet. The contact LD_{50} for this compound is listed as 0.0001 mg per bee (= 0.1 µg/bee = 100 ng/bee). Surprisingly, there doesn't appear to be any published oral LD_{50} for Phosmet to honey bees! By my math, the concentration of Phosmet in Jim's pollen sample would not be expected to have killed his bees either, although since it is a violation of the label to spray the insecticide on flowering crops, one is left wondering how it appeared in the pollen.

So this is how it can be for a beekeeper and his innocent bees—the suddenly-appearing piles of rotting corpses in front of every one of his hives certainly suggest that his bees were killed by a pesticide application. Unfortunately, due to a lackluster investigation by the primacy partner, and lack of implicating chemical evidence, Jim will never know what or who was responsible for the kill, nor be compensated for his losses, if justified. And he has no idea whether the same thing will happen again next season!

To make matters worse, Jim's bees apparently got hit again in July, resulting in piles of greasy-looking dead and twitching dying bees in front of the entrances. And as I write these words in November, Jim sent me yet another photo of hundreds of freshly-dead bees once again in front of the hives (despite him confirming low levels of varroa and nosema). Jim is now a justifiably frustrated and angry beekeeper--not only did he suffer considerable financial loss (not to mention the ugly death of his beloved bees), ***but no one learned anything from the experience!*** The unwitting farmer(s) have no idea whether their pesticide applications caused the problem, Jim's state agencies aren't making any particular effort to prevent the same thing from happening again next year, and EPA didn't receive any useful adverse effects report. Yes, frustrating!

It is disturbing for me to present these facts. Our managed honey bees function as a conspicuous and charismatic indicator species for the effects of pesticides upon "non target organisms." Yet some agricultural areas are a "no bees land" due to either inadequate label restrictions or flagrant violation of those restrictions. And keep in mind that the honey bee colony has the capacity to absorb pesticide kills that would exterminate solitary pollinators, such as native bees, butterflies, and beneficial insects.

Practical application: if honey bee colonies are being killed, we can safely assume that the situation is even worse for more sensitive species!

KEEP 'EM HONEST!

Let me share another quote from the Indemnity Report:

The Beekeeper Indemnity Program itself discourages civil court action…Greater use of the civil court system by beekeepers to seek compensation for pesticide losses could reduce applicator negligence.

There you have it! The sad truth is that it will take the push of lawsuits to ensure that our pesticide laws are actually enforced. Accordingly I've studied the judgments for some beekeeper lawsuits. Be forewarned that a successful lawsuit requires unimpeachable evidence and impeccable argumentation—so one should not enter into an expensive lawsuit lightly!

The AHPA has started a legal defense fund to pursue test cases against egregious violations of pesticide law, with the hope of setting legal precedent, as did Jeff Anderson's successful lawsuit against the state of Minnesota in 2005 [10]. I'm hesitant to step into politics, but I feel that this is probably a good course of action that could help the cause of advancing pesticide regulation. We beekeepers must tread carefully here to avoid pissing off the farmers who allow us to place bees upon their land. In truth, I'd like to see Xerces or some other environmental groups filing such lawsuits, so that they, rather than beekeepers, would take the heat. However, action is preferable to inaction.

Action item: you may join me in contributing to the National Pollinator Defense Fund at http://pollinatordefense.org/site/?page_id=11

I wish that I could present a simple solution to this problem, but there isn't one—especially since the US is currently locked into the high-input large-scale monoculture agribusiness model. The good news is that EPA is on the side of the beekeepers and the environment [11], and that things are clearly getting better—the worst pesticides are being phased out, new "reduced risk" pesticides and "biological" are put on the EPA fast track in order to get them into the market, plus a new generation of "smart" robotic application systems are being developed. There has never been more public awareness of the plight of the honey bee, and beekeepers are awkwardly basking in the spotlight of being considered as environmental stewards. The bad news is that the process of reducing the damage by pesticides to non-target species is hampered by, among other things, ignorance (and lack of enough good scientific data), politics, property rights, consumer demand, and Money (intentionally spelled with a capital M).

OK, that's enough griping for now-let's get back to an investigation into any connection between pesticides CCD.

PESTICIDES AND CCD

Biological plausibility: pesticides can weaken the colony by killing or otherwise affecting the foragers, reducing adult bee longevity, having adverse effects upon the queen, brood, or nurse bees, or by affecting bee behavior. In addition, they could react with other toxins, beekeeper-applied miticides, or suppress the bee immune response to pathogens. Any of the aforementioned could conceivably result in colony dwindling, mortality, or collapse.

RESIDUES IN THE COMBS

Let's narrow down our focus. CCD by definition is not the result of the sorts of acute pesticide kills detailed above. So what we are interested in is colony mortality or morbidity due to ***sublethal*** effects that hadn't already killed bees outright! In the case of winter mortality, since few pesticides are applied at that time of year, and since colonies normally purge any remaining field bees during the "fall turnover" [12], we'd expect any contribution by pesticides to be from residues in the combs, where they should be detectable by analysis.

MAKING THE LINK

One would think that it would be a simple matter to make the connection between pesticide residues and winter mortality—simply analyze pollen and beeswax samples from the combs, and determine whether there is a correlation between residues of specific pesticides and colony mortality.

The above sounds so straightforward and easy, but in actuality this is where it gets complicated. ***My point of going into detail on the analysis of Jim Doan's apparently obvious bee kill was that if it's that hard to figure out exactly what caused an acute pesticide kill, imagine how difficult it would be to definitively link colony mortality to any sublethal effects from a specific pesticide!***

In fact, I took artistic license in greatly simplifying Jim's story. In doing my usual fact checking, I found out that the actuality was complicated by personalities, politics, weather (Fig. 7), and a history of indemnity payments. To add further confusion, ***another beekeeper on the same farm did not observe any dead bees in front of his hives*** (but did notice that his nucs on that farm did not build up as well as those at other nearby locations).

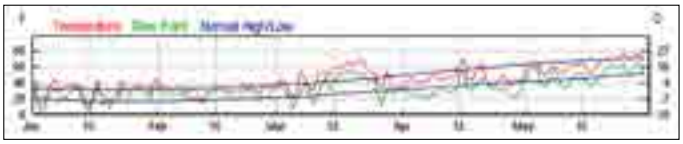

Figure 7: Western New York experienced extraordinarily warm weather (followed by cold) in May. I find that such weather anomalies can result in piles of dead bees in front of hives due to short-term starvation events.

Weather graph from: www.weatherunderground.com.

However, I'm appreciative of Jim for sharing his observations and analysis report, and feel that it was a good example of the problems that researchers and regulators encounter as they try to figure out exactly how pesticides are affecting colony health.

These complicating factors may be why no scientific study has yet been able to firmly link colony mortality to pesticides. Here are the conclusions of all monitoring and analytical studies that I've seen to date:

- **Germany:** "As expected, the results show that pollen [from 210 hives sampled over 3 years] is contaminated with a plethora of chemical substances originating from the agricultural practice of using pesticides but also from the apicultural necessity of using acaricides… Accordingly, no relation between contamination of pollen and colony development or winter losses could be demonstrated in the course of the project although special emphasis was put into this aspect" [13].

- **France:** "Several cases of mortality of honey bee colonies (varying from 38 to 100%) were observed in France during the winter of 2005-6. In order to explain the causes of these mortalities, a case control study was conducted on a limited area, together with a larger survey in 18 other apiaries located in 13 sites over the entire country…No pesticide residues of agricultural origin were found in the samples of beebread, beeswax, honey and dead honey bees, with the exception of imidacloprid…found in one apiary [and] not considered to be able to cause honey bee acute mortality" [14].

- **France:** "A 3-yr field survey was carried out in France, from 2002 to 2005, to study honey bee … colony health in relation to pesticide residues found in the colonies… No statistical relationship was found between colony mortality and pesticide residues" [15].

- **Italy:** "The data obtained from the winter 2009-2010 inspections were used as the basis for chemical analyses on bee and wax samples, to test for residues of organophosphate, organochlorurate, carbamate and neonicotinoid pesticides, but no significant presence of these substances was detected" [16].

- **Spain:** "The present data [beebread samples from 12 apiaries] are in agreement with studies showing no negative effects of seed-treated crops. Some pesticide residues were found here, in particular several varroacides and insecticides, but no significant differences were observed between the different sunflower crop samples and those from the sites of wild vegetation. This fact not only implies environmental contamination but also supports the theory that, most of the time, inadequate [read that "unapproved"] treatments are the main source of residues that might weaken bee colonies and make them more sensitive to other factors" [17].

- **Spain:** "This study was set out to evaluate the pesticide residues in stored pollen from honey bee colonies and their possible impact on honey bee losses in Spain. In total, 1,021 professional apiaries were randomly selected… A direct relation between pesticide residues found in stored pollen samples and colony losses was not evident accordingly to the obtained results" [18].

- **Europe (thorough review):** "Currently there is no clear evidence from field based studies that exposure of colonies to pesticides results in increased susceptibility to disease or that there is a link between colony loss due to disease and pesticide residues in monitoring studies" [19].

- **USA (CCD Descriptive Study):** "This study found no evidence that the presence or amount of any individual pesticide occurred more frequently or abundantly in affected apiaries or colonies" [20].

- **USA (2012 CCD Progress Report): "**When pesticides are viewed in aggregate on a national scale, residues of pyrethroids …pose a threefold greater hazard to bee colonies than neonicotinoids, based on mean and frequency of detection in pollen samples and relative acute toxicity. The synthetic pyrethroid detected in the highest quantity and frequency in honey bee colonies that is used by beekeepers to control *Varroa* mite is tau fluvalinate" [21].

- **USA (Stationary Hive Project) :** "We did not find any relationship with any of our measures of pesticide contamination and colony loss rate at the apiary level for either 2009 or 2010" [22].

OK, I'm as puzzled as you are! It defies both common sense and a long history of beekeeper experience that researchers haven't yet nailed down any link between pesticide residues in the combs and colony mortality! The above were not industry-funded studies, and several of the researchers started with a strong anti-pesticide bias (nearly all researchers suspect that pesticides are involved to some extent). And *I'm* certainly not about to tell you that pesticides/miticides and winter mortality are unrelated--it's just, like I said, *complicated.*

I found that in order to begin to understand the effects of manmade pesticides upon bee health that I first needed to back up and examine some of the complex biology involved in natural bee/plant/toxin interactions. We'll start in on that next month…

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These articles were originally published in the American Bee Journal.
All of Randy's bee articles may be found at: www.Scientificbeekeeping.com.
If you find these articles of use.
Randy appreciates donations to fund his efforts.

BEES RECOGNISED AS CRITICAL TO SUSTAINABILITY

Bees and their role as pollinators have been recognized in a prestigious Australian Sustainability Award. Mitchell Pearce won the youth category for his outstanding contribution and leadership in sustainability following the success of his Canberra Urban Honey project.

Mitchell Pearce proudly showing his award

Canberra Urban Honey is a youth led initiative to promote urban agriculture and is a community driven local response to the emerging global losses of bee pollinators. Judges commented that the loss of bees is a potential planet wide ecological catastrophe and so any education and action based program that can engage the community and provide them with an opportunity to contribute is of great value.

Canberra Urban Honey works with local Canberra households and businesses to inform and educate them on the importance of bees. Households have had productive honeybee hives installed into their gardens and commercial buildings have had hives installed on their rooftops. Already this has resulted in an approximate additional coverage of 25% of the Canberra area, resulting in improved pollination for native, ornamental and productive veggie gardens alike.

A key factor in the success of Canberra Urban Honey is Mitchell's strong family ties to a rural commercial beekeeping family. Mitchell is the grandson of Len and Kathy Walker, and nephew of David and Jodie Walker of Inverell, in North West NSW. The Walker family has been beekeeping for nearly 100 years and Mitchell has been applying that generational beekeeping knowledge to urban beekeeping with great success.

The Canberra Urban Honey project has won numerous awards recently including being Australia's first urban honey to be awarded a silver medal in commercial classes at the National Honey Show at the 2014 Sydney Royal Easter Show. Mitchell was also recently awarded "Most Successful Apiculture Exhibitor" at the 2014 Royal Canberra Show amongst many awards.

When making the Australian Sustainable Cities Young Legend Award to Mitchell, Judges commented how quite often emerging youth sustainability leaders seek to share skills that they themselves have not yet mastered. Judges said "this can create a weakness in the level of sophistication of the initiatives and increases the likelihood of failure. However, in Mitchell's case, his links to a multi-generational family of beekeepers means he actually does have relevant experience that expertise is built upon, having learnt the techniques and traps of bee keeping from his family."

As Australia strives to establish sustainable cities, initiatives like Canberra Urban Honey will need to be rolled out across all cities. Commercial beekeepers can play a key role in establishing the vital link between urban and rural agriculture.

Mitchell hard at work!

The Australian Sustainable Cities Young Legend Award recognizes successful outcomes from youth led environmental action. The Australian Sustainable Cities Awards are managed by the Keep Australia Beautiful Organisation. More information about Canberra Urban Honey can be found at CanberraUrbanHoney.com.

Carmen Pearce
P: 0400 385 576 E: Hive@CanberraUrbanHoney.com

GET READY FOR THE ANNUAL
Bee Week Field Days & Honey Festival
May 22 & 23, 2015

It is with great pleasure that we invite you to participate in the annual Bee Week Field Days & Honey Festival, which will be held at the Orange Showgrounds, Leeds Parade, Orange NSW.

This event will be held in conjunction with national Honey Month & is a fun-filled opportunity for you to stay abreast of changes in the industry and to educate the general public.

We're looking for any bee or honey-related stall holders to participate over the 2 days - with stalls starting at just $55.
Email nswbeeweek@gmail.com for an application form

Industry leaders speaking about topical issues

Fun activities for the kids + a jumping castle

Honey tasting competition & stall holders

WWW.NSWBEEWEEK.COM

QUEEN BREEDING FIELD DAY

On the 29 November 2014 the STB held a queen breeding field day, with 29 participants attending the day. The branch had the privilege of having Elizabeth Frost and Joe Horner pass on their extensive knowledge, essential for successful breeding of queen bees.

The field day included both theory based and hands on learning of grafting methods and techniques, as well as appropriate conditions to raise queen bees. Undoubtedly, all participants took home a wealth of knowledge and eager to put their new skills to the test.

Elizabeth Frost (in blue) sorting out a hive

Joe Horner giving a group lecture

Bill Stratton explaining grafting

Ron Witz grafting Queens

The STB would like to thank Elizabeth, Joe and all volunteers for their help on the day and for all the work that went into putting the day together, it was greatly appreciated. The branch would also like to thank all who attended and participated in the field day.

James Kershaw, President
Southern Tablelands Branch

AUSTRALIAN HONEY BEE INDUSTRY COUNCIL INC

ABN: 63 939 614 424

Address: P.O. Box 4253, Raceview Q 4305 Phone: 07 5467 2265
Email Address: ahbic@honeybee.org.au Web Site: www.honeybee.org.au

RE: Proposed National Bee Biosecurity Program and Biosecurity Code of Practice

Dear beekeeper,

Regardless of whether you own one hive or a thousand, every beekeeper has a crucial role to play in protecting their business or hobby by remaining alert to and preventing the spread of a range of both established and exotic pests and diseases.

For this reason, the honey bee industry, represented by the Australian Honey Bee Industry Council (AHBIC) an Plant Health Australia, have been working with State Governments and the Australian Government on developing the National Bee Biosecurity Program and Code of Practice. Although still draft at this stage we are hoping to have all of industry comment on the proposed Code and Program.

The purpose of this Program is to promote beekeeping best management practices in Australia through the establishment of a mandatory Biosecurity Code of Practice for beekeepers. The Biosecurity Code of Practice is based on the principles of good biosecurity and aims to provide a clear framework for Australian beekeepers to engage in best-practice biosecurity.

To enforce the mandatory Code of Practice, and to help ensure that Australian beekeepers are following appropriate biosecurity practices, the Program would employ a specific Bee Biosecurity Officer in all six states This 'new' position would undertake a range of activities, such as inspections, education and training for beekeepers, as well as assist in the event of an incursion of an exotic pest. It is proposed that this position would be within the department of primary industries of each state government, and would be funded through a combination of beekeeper levies and state government contributions.

This Program is being proposed to improve the management of established pests and diseases, as well as increase the preparedness and surveillance of exotic pest threats in the honey bee industry, such as the Varro mite.

In an effort to consult with all registered beekeepers and seek their feedback on this proposal, we are asking that you go to the AHBIC website (www.honeybee.org.au)to learn more about what is being proposed and how this may affect your hobby, or your business.

Once you click on this link you will see the details of the proposed Program and Code, as well as a standard feedback form which you can fill out and send to your state beekeeping association. Your comments will be collated by the state beekeeping association and be passed through to industry and government representatives to consider when designing this Program and Code.

If you have any questions contact AHBIC on ahbic@honeybee.org.au

Regards
Australian Honey Bee Industry Council Inc.

Trevor Weatherhead
Executive Director

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

AHBIC NEWS - Update January 2015

POST ENTRY QUARANTINE FACILITY
The new post entry quarantine facilities at Mickleham in Victoria are currently under construction.

For importing queen bees, this will take the place of Eastern Creek in Sydney.

To see how much progress has been made, please visit the Post Entry Quarantine GovSpace website at: https://postentryquarantine.govspace.gov.au to see a time-lapse video showing pictures of the site from May till November 2014.

To see this progress in photos, have a look at the new photo gallery which contains monthly photos of the progress at each of the compounds. Check back every month to look at the progress of these buildings through 2015.

AQBBG BREEDING PROGRAM
AHBIC owns the Australian Queen Bee Breeding Program (AQBBG). It needs support from beekeepers to keep it going. With recent testing showing that the program has desirable genetic qualities in the form of the cleaning genes, beekeepers can avail themselves of breeding stock to raise their own queens.

Go to http://honeybee.org.au/programs/queen-bee-breeding/ to see the history of the evaluations that have been carried out over the years.

CONGRATULATIONS TO PROFESSOR BEN OLDROYD
Back in October, 2014 Ben received an award for which I am sure all beekeepers will join AHBIC in congratulating Ben on. The following is from the University of Sydney School of Biological Sciences' page.

In a ceremony at NSW Government House, Professor Ben Oldroyd received a 2014 NSW Science & Engineering Award. Ben won the 'Excellence in Biological Sciences (Ecology, environmental, agricultural and organismal)' prize for his work on behavioural genetics and the evolution of social behaviour.

The NSW Science and Engineering Awards are given annually and acknowledge the state's leading researchers in science and engineering for innovative work that generates economic, health, environmental or technological benefits for New South Wales.

Ben has made significant contributions to our understanding of how honeybee societies are regulated and policed, and how they evolved. He is also heavily involved with the Australian beekeeping industry, helping beekeepers breed better, healthier strains, and providing scientific advice on matters ranging from quarantine and the problems of feral bees.

He has shown that sterility has a genetic basis and identified related genes. His work on the evolution of sociality is particularly profound, because it has united the disparate fields of theoretical population biology and molecular biology. Ben's ground-breaking work on feral bee populations includes providing the only reliable estimates of feral colony distributions across South East Australia, based on an ingenious genetic sampling technique.

Ben's breeding techniques are now widespread in the Australian beekeeping industry, enhancing productivity. His book, titled 'Asian Honey Bees: Biology, Conservation and Human Interactions', published by Harvard University Press, is the authoritative text on the subject.

BEES AND HI-VIS CLOTHING
I have had a query asking if bees are attracted to Hi- vis clothing, in particular the green/yellow and orange. Also has anyone had any reactions to navy blue? Please let me know if you have had any experiences.

TURKISH HONEY
I have heard back from the New South Wales Department for Health re our complaint against Garden Honey. They said *I agree that this product cannot be called Honey based on the ingredients. As such, we will take appropriate measures to ensure that the product is either re-named or discontinued from supply in NSW.*

When I received this I queried if it would apply to the product being sold in States other than NSW. The answer was *As the importer, the Code requirements apply to all products they import, regardless of which state they on-supply.*

So hopefully this product will be off the shelves. Please let me know if you see it anywhere. Also please keep your eyes open for any other products that do not conform to labelling.

EXPORTS OF HONEY TO JAPAN
The Department of Agriculture website is up and running.
It is http://www.agriculture.gov.au/agriculture-food/meat-wool-dairy/quota/japanquotas

AHBIC and the Honey Packers and Marketers Association of Australia (HPMAA) have been active in trying to make this information available to those who may be exporting to Japan. AHBIC realises that there may be some exporters who are not known to us or the HPMAA. If you supply honey to a person who has exported to Japan, please let them know about the website so they can obtain the information.

ANNUAL MEETINGS
AHBIC will be holding its AGM on Saturday 4 July 2015 at the Penrith Panthers Leagues Club at Penrith. This will follow the NSWAA conference. More details on the AHBIC AGM later.

Queensland Beekeepers Association - 11/12 June - Cleveland
New South Wales Apiarists Association - 2/3 July - Penrith
Tasmanian Beekeepers Association - 29/30 May - Smithton
WA Farmers Federation - Beekeeping Section - February
South Australian Apiarists Association - 18/19 June - Nuriootpa
Victorian Apiarists Association - 10/11 June - Bairnsdale
Honey Packers and Marketers Association TBA
National Council of Pollination Associations - 2 July - Penrith
Australian Queen Bee Breeders Association TBA
Australian Honey Bee Industry Council - 4 July - Penrith

BEEKEEPERS INSPIRE FASHION DESIGN
The last thing I imagine beekeepers would believe is that they can inspire fashion designs. This link was posted on a beekeeping chat page.

Does this mean the price of veils goes up or can you have you own designer label veil? http://tinyurl.com/kwo934q.

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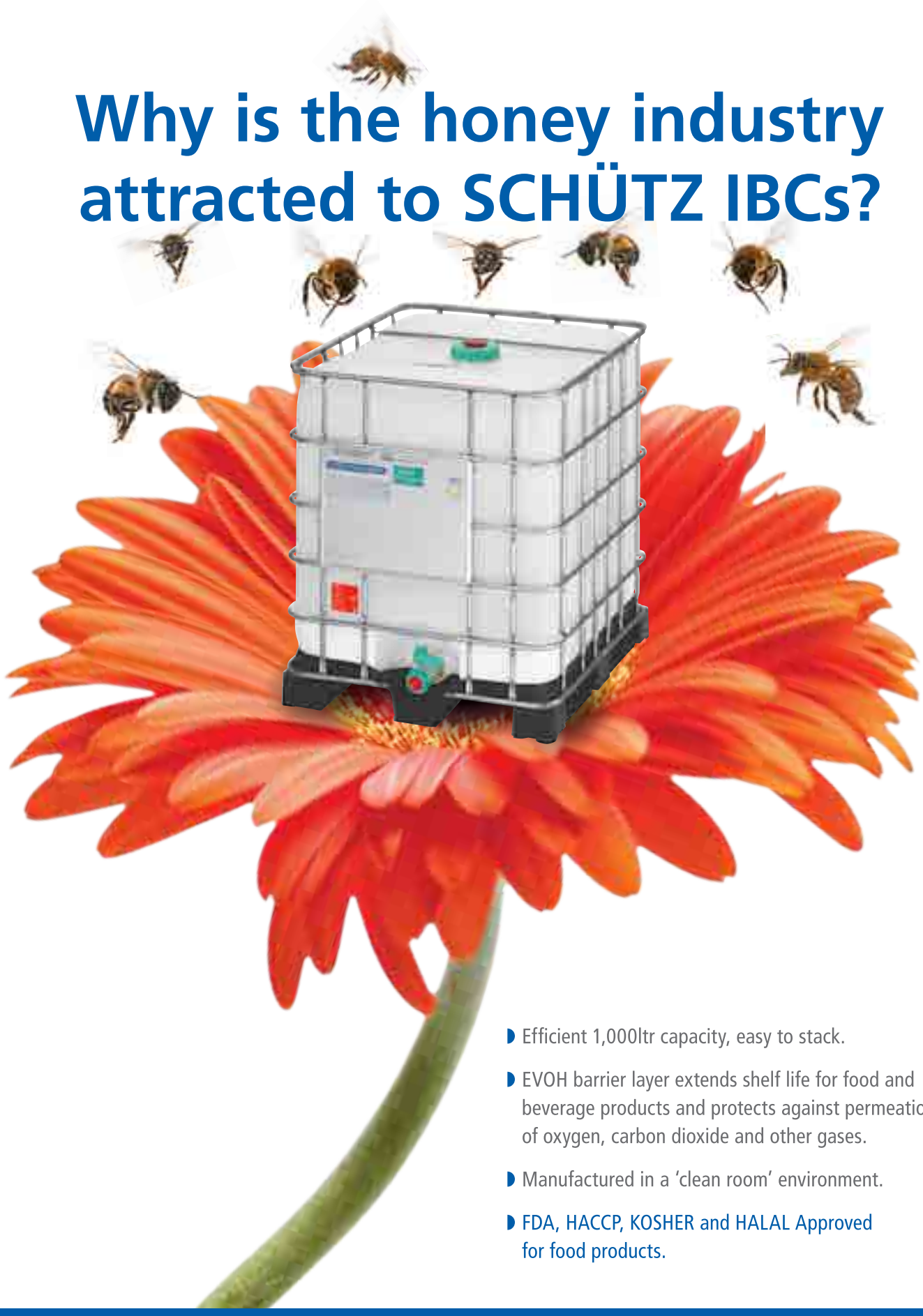

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