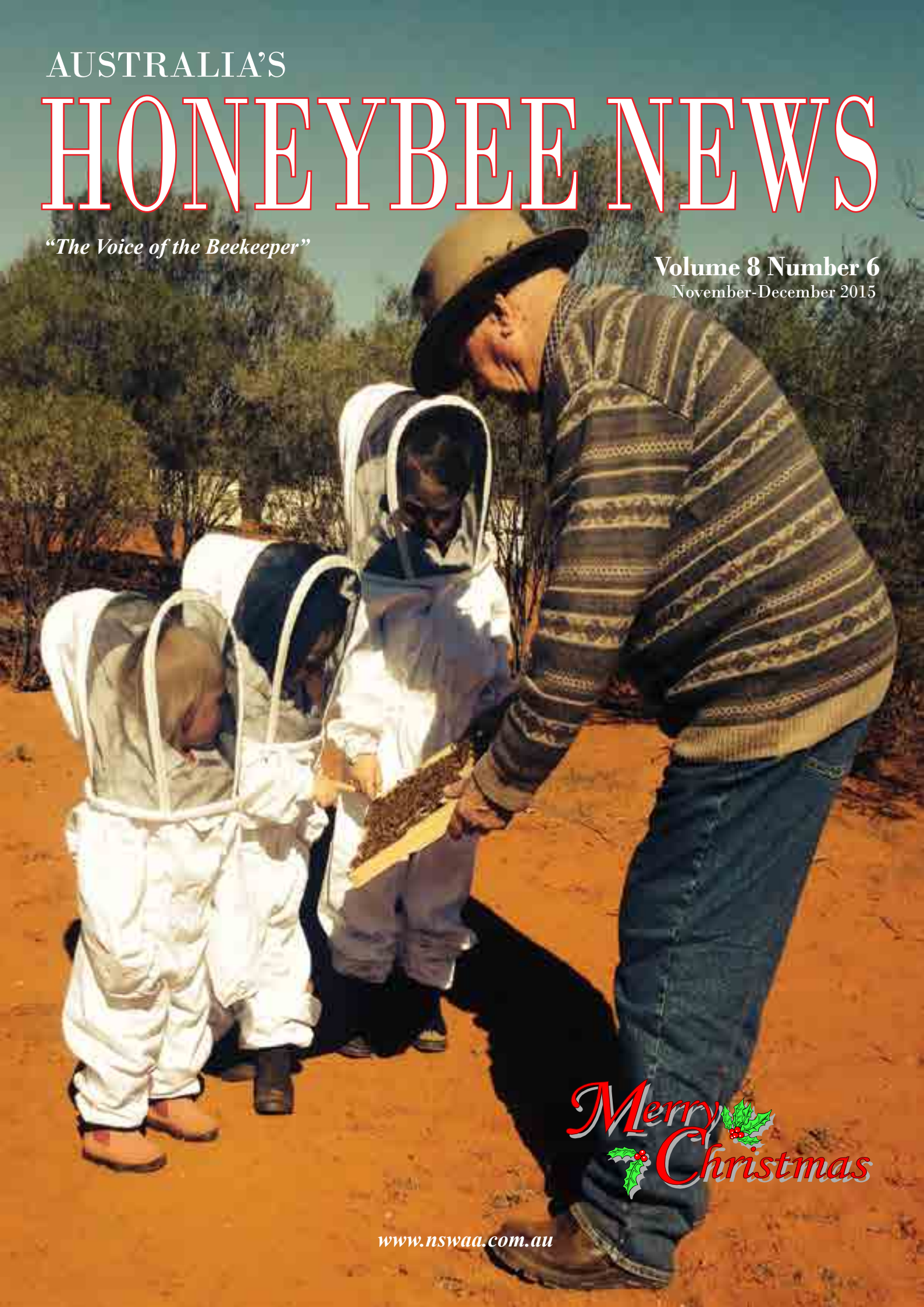

AUSTRALIA'S

HONEYBEE NEWS

"The Voice of the Beekeeper"

Volume 8 Number 6
November-December 2015

Merry Christmas

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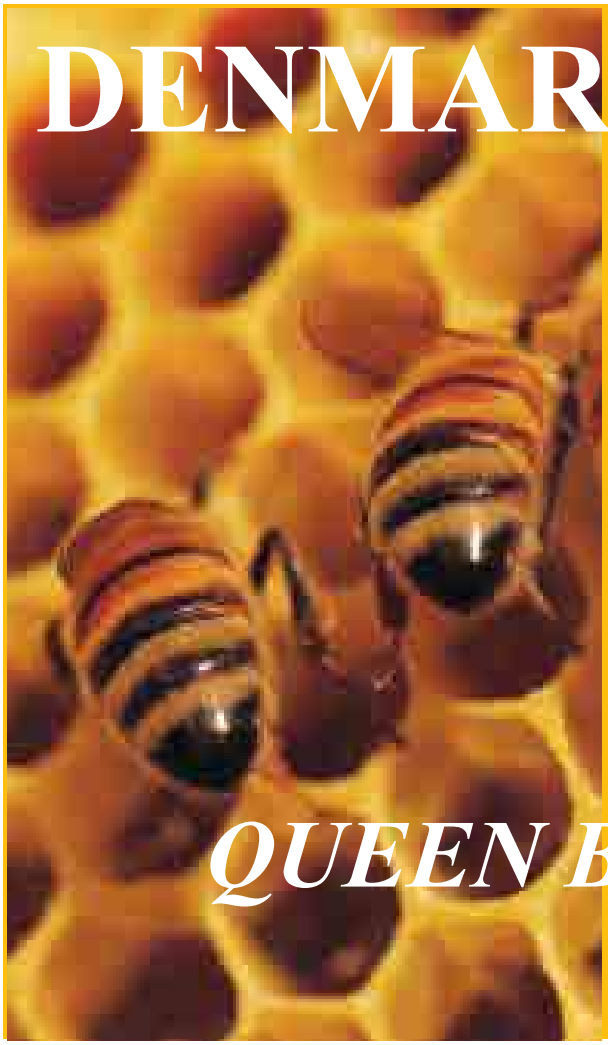

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AUSTRALIA'S HONEYBEE NEWS

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CONTENTS

COVER: Warren Jones sharing his beekeeping knowledge with the next generation - his grandchildren: Damon (6), Alton (3) and Ingrid (20 mths) at Kilberoo Station, Yantabulla in North West NSW PHOTO: Bryn Jones

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PRESIDENT'S REPORT

Yet another year draws to a close and once again it has been a struggle for many with hot, dry conditions during early spring terminating many early prospects, for those fortunate enough to be extracting a surplus, the November rains abruptly ended flows such as Grey Ironbark flowering on the South Coast and the Hill Gum inland.

Since the heavy spring rains most eucalypts have grown, here's hoping at least some will set buds for coming season.

Prospects on the South Coast for autumn through winter still remain reasonable. Overall the season has been difficult and one can only hope the prices paid to beekeepers remain at reasonable levels.

The Almond Industry continues to expand and will require many more hives over the coming years which leads me to my next point.

RESOURCE
Our industry will be expected to provide large numbers of hives to pollinate almonds now and into the future. To be able to sustain these extra colonies industry must be able to expand the current floral resource base.

The only way this will occur is if Government and public land managers realise the importance of our industry and allow us into suitable forested lands.

APIARY SITE WORKING GROUP
The Apiary Sites Working Group has been formed after agreement between Ministers Blair (Agriculture) and Speakman (Environment) that agencies should work together to develop a common policy for apiary on public lands,

The group consists of representatives from the Department Primary Industries (DPI), Forestry Corporation NSW (FCNSW), National Parks and Wildlife Services (NPWS), Lands Department, Local Land Services (LLS) and the NSW Apiarists' Association (NSWAA). Representatives are also being sort from Roads and Maritime Services (RMS) and NSW Water.

The inaugural meeting was held on 13 November and ambitious objectives were outlined. If all goes to plan, proposals or recommendations aimed at gaining an overarching policy on public lands and the ability to have a uniform payment framework i.e. one stop shop will hopefully come to fruition during my term as President.

FORESTRY CORPORATION NSW
Forestry Corp seems to be intent on maximising returns at the expense of beekeepers. Your industry reps are having difficulty changing that corporate attitude.

NATIONAL PARKS AND WILDLIFE SERVICE
After months of negotiations your resource committee representatives have had some great news regarding the return of 103 previously held sites, to industry.
The details of proposed reallocation will be forthcoming in the New Year, but in the meantime we have printed the area map and general locations later in this issue.

Still of major concern is the NPWS's failure to recognise bee sites on private lands when transfer to National Park Estate occurs.

I realise that you are all busy and time poor but unless a concerted effort is made by all members to take the time to relay your industry's concerns about resource issues to at least your local member, we may all have plenty of spare time on our hands as resource security diminishes. I say all members not just the beekeepers that utilise public lands, because if the usable area of public lands reduces many beekeeping enterprises will have to seek alternate resource which will severely impact all.

DEPARTMENT PRIMARY INDUSTRIES
We are still awaiting the arrival of Elizabeth Frost from USA to take up her role with the department at Tocal College. I am reliably informed that her visa application is in the final stages and we hope Elizabeth will be joining the DPI team early in the New Year.

BEE BIOSECURITY OFFICER (BBO)
The Bee Biosecurity Officer position has been advertised and seventeen candidates applied. The interview panel which consists of representatives from DPI, Plant Health Australia (PHA) and NSWAA has completed the first stage of interview and has short listed four candidates.

The panel is now in stage two of the process which involves face to face interviews to determine the candidates' suitability when confronted with industry issues.

2016 CONFERENCE
Plans are well underway for the 2016 Annual State Conference which will be held on 12/13 May at the Commercial Club, Dean Street Albury. A draft Agenda and Registration details will be in the next edition.

2016 SYDNEY SHOW
Next year's Sydney Show starts on 17 March 2016 and runs till 30 March, which in beekeeping terms is early but as they say "the show must go on". Volunteers are needed to help efficiently run Honeyland. Some of your valuable time to help out at this event would be greatly appreciated. Volunteer Forms are included in this edition.

Anyone with good straight lines of honey available for donation or sale to your Association, please contact Show Coordinator Bruce White on brucesown@outlook.com.

MEMBERSHIP
Members please note that as of 1 March 2016 membership fees will rise in accordance with the Conference resolution passed last July.

There is an article published in this edition that explains the reasons for such an increase.

I believe your executive has had a tremendous workload these last few years and this seems to be only increasing as we endeavor to secure an equitable system of bee site access and allocation.

I wish to take this opportunity to extend my best wishes to all for a joyous festive season and prosperous New Year.

Neil Bingley
State President

NEW MEMBERS

A warm welcome to the following new members:

Benita Abel & Christopher MacIndoe	Orange
Steve Ahern	Blackheath
Alwyn Alcorn	Orange
Debbe Allen	Coraki
M Baker	Bathurst
Heather Bevan & Gil McFawn	Guyong
Adam & Steve Cleary	Blacktown
D Cole	Neville
E Cottage & D Lummis	Millthorpe
R Gordon	Millthorpe
Sally Gordon & Diana Bell	East Guyong
George Hempel	Lawson
Emma Herbert	Bathurst
Peter Hildenbeutel	Blayney
Carmel James	Barrabra
Peter & Meg Low	Oberon
Teresa Luczak	Bathurst
T & H Nankervis	Eglington
Will Redfern	Wellington
Pamela Speralakis	Tarana
Diana Stewart	Rock Forest
K C Tang	Orange
T Thomas	Springside
Harley Tom	Parkes
Peter & Jill Warth	Ramsgate

SHOW NOTICE

Volunteers are needed for the 2016 Sydney Show which runs from

17 March -30 March 2016

In this edition there is a Volunteer Form

Please note *Country volunteers needing accommodation must return their form no later than 3 February 2016*

If you would like to assist you will be very welcome. Entry ticket is provided + free time for exploring the Show is also arranged.

Contact: **BRUCE WHITE**
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WHY THE NEW FEE STRUCTURE FOR NSWAA MEMBERSHIP?

A new fee structure was proposed and passed at the 2015 AGM in program. There was very little discussion from members present who then passed the resolution with a resounding vote.

Since the AGM the committee has had feedback both positive and negative. Primarily the negative feedback has been about the fees for amateurs and those with a few hives. The base rate is set at $100.00 primarily due to the cost of the Honeybee News. Annually the Honeybee News cost approx. $70.00 for each member, which will be reflected in new subscription rates. The committee will explore the possibility of an electronic copy of the Honeybee News. This may allow a lower membership fee for those who have a few hives and choose to receive an electronic newsletter.

Security of resource has been the main focus for the NSWAA executive for many years. Attempting to achieve this involves ongoing meetings with various ministers and their advisory staff. When there is a change of government, this process starts over. In addition there are the meetings with the public land managers – National Parks, Forestry NSW and TSR managers. For the president and vice president of NSWAA these meeting and associated travel are very time consuming. The last few presidents can attest that this time comes at a great cost to their family life, business and resultant income.

Remember these meetings are on top of the NSWAA, AHBIC, government industry meetings and other meetings as required. Unfortunately these meetings do not occur during the winter quiet season but throughout the year, often at the busiest time.

Employing someone who can shoulder some of this workload will reduce the current time commitments by the president and vice president and the resultant pressures on their personal and business lives. Hopefully this will encourage more beekeepers to accept nominations to the NSWAA executive. Elections for positions on the NSWAA executive will make for a stronger and healthier Association.

The executive is exploring the idea of hiring expertise as required The political situation and public land management has changed dramatically in recent times. Employing someone who can assist with gaining access to ministers and their advisors has become a priority for the Association. The executive will certainly still attend meetings with ministers but the additional person/s would attend meetings with advisors and assist to arrange meetings.

To do this an increase in income is required. Compared to most other industries the NSWAA fee structure is very low. Under the new fee structure a beekeeper with 401 hives will pay $401.00. Most years, at current honey prices, this is approx 0.16% of their annual turnover to the NSWAA. The new fees are structured so that those who benefit the most pay the most.

Belonging to the NSWAA is NOT compulsory and there are many beekeepers that reap the benefits and efforts of the NSWAA for no cost. Then there are beekeepers who declare less hives than they have or change their status so they have the benefits of being a NSWAA member but pay less than their share. The income from this new fee structure should generate extra money for the Association – however this will rely on the honesty and integrity of beekeepers in our state.

In summary this new fee structure will move the Association towards being more professional. This will result in better outcomes for our members and build on the good work that has been done over many years.

Stephen Targett
Executive Councillor

FLOW HIVE COMMENTS!

Bee Keeper or Bee Haver?

Along with many of our members I too watched the recent ABC Australian Story on the birth of the Flow Hive. I must commend the inventor on having an inquiring mind and the patience to follow it through to what he (they) believe is its completion.

Looks great doesn't it? Just think we can turn up to an apiary with a pallet of jars and go to it. Won't you have to run as they all come to the full level at the same time!!!

Wow what a bonanza. Might have to take the handles home with you before the next bloke comes along with his barrow load of containers.

I recall hives gaining at a rate of 5kgs a day on the last Narrow Leaf Peppermint flow in 2013. Hope the bees can ripen the honey quick enough so I can get handle practice.

What the bloody hell is going to happen if somebody produces some Canola honey and leaves it in the hive for a few days too long? Or some nice Banksia or one of the other fast candying varieties. Lock Jaw!!! There will be a market for Flow Hive frame heaters

Now I wonder if all the people who ordered one of these contraptions (one or two or 21,000 odd) have thought about where the bees are??

Of course the thing doesn't come with bees??!?!?

Some of you forward thinking marketing types could have a ball selling start-up kits and bees, and then doing it all again next year when it is found the bees didn't survive.

I think we might have a new class of bee person. A Bee Haver. This adds to the Bee Keeper, and the Apiarist (a person who's bees keep him).

For those of you who watched the program, Dr Shona Blair alluded to the biosecurity dramas that this product has the potential to present. You must check through the beehive brood nest on a regular basis. Disease inspections are an essential part of beekeeping.

Having a hive to turn a lever on alludes to a process where the bees are left alone to hopefully do their own thing. **This just isn't a perfect world. Remote control just won't cut it here.**

I suppose the various beekeeper groups had better get ready for the onslaught of bee havers getting ready to be told what to do next. There should be a new category in the memberships - Bee Haver. Double the price.

I wonder what was wrong with buying a jar of honey at the supermarket. Much cheaper, leave the beekeeping to people with passion and compassion.

For Bees

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IMPORTATION OF HONEY BEE SEMEN

The current arrangement for the importation of live queen bees into Australia is lengthy and expensive. Only recently the quarantine facility at Eastern Creek in NSW was closed. Future importations of queen bees will occur through a new facility outside Melbourne airport. There are a lot of practical issues in the way for NSW beekeepers wanting to utilise the Victorian facility – not the least being the distance needed for NSW beekeepers to service their support hives. Also, weather conditions of the Melbourne area are generally not conducive to bees.

This is likely to make the importation of queen bees a diminishing activity in the beekeeping industry in Australia. As an alternative, it has been proposed that the importation of drone honey bee semen be allowed after due risk assessment and process.

A number of individuals, including Ron Clarke from Western Australia, and the Australian Honey Bee Industry Council (AHBIC) have lobbied the Federal Department of Agriculture to conduct a risk assessment to allow the importation of drone honey bee semen.

An initial meeting was held in Canberra in August 2014 between the interested parties, including AHBIC, Ron Clarke, Elizabeth Frost and myself (NSW DPI), and two CSIRO representatives, plus the Federal Department of Agriculture, Fisheries and Forestry staff. That initial meeting was to determine how strong the need was for an import risk assessment for drone honey bee semen. The original import risk assessment for the importation of queen bees was published as a draft in 2002, but never ratified. This was eventually completed in 2012, followed by some success with the importation of queens into Eastern Creek. During 2015 the Department of Agriculture worked on the compilation of the draft policy review of the importation of drone honey bee semen. This was released in September 2015. A copy of that draft can be obtained on www.agriculture.gov.au/biosecurity/risk-analysis/memos

The purpose of this draft policy review was to determine if drone honey bee semen imports presented a risk to the Australian beekeeping industry and to Australia in general.

Within the body of the document, the main concern is that *the appropriate level of protection is achieved*. This is defined in the document and needs to be rated *negligible* or *very low* in relation to the risks of importing biological materials. Thus, a risk assessment is required of all the potential pests and diseases that could accompany the importation - in this case drone honey bee semen.

The biggest concern that exists with semen is DNA. This is particularly so in the case of two South African bees - *Apis mellifera scutellata* and *Apis mellifera capensis*. *Apis mellifera scutellata* is commonly referred to as 'African bees'. This bee, when crossed with European strains of bees, becomes an Africanised bee, such as exists in the USA. C*apensis* is the 'Cape honey bee'. The Cape honey bee is not known to have extended its range outside of South Africa, so the risk associated with importing that particular DNA is rated at the lowest assessment level.

Successive Australian governments have maintained a conservative, but not zero, risk approach to the management of biosecurity risks. To achieve an appropriate level of risk, management measures are proposed to reduce this risk to an acceptable level. However, if it is not possible to reduce the risk to acceptable levels then the trade will not be allowed. The published review applied directly to semen extracted from honey bee drones in the country of export and transported to Australia.

In relation to the conditions of importing queen bees into Australia, the main concerns were Africanised honey bees, varroa mites, tracheal mite and tropilaelaps mites. The very nature of semen suggests that varroa mites, tracheal mites and tropilaelaps mites cannot biologically be an issue with importation of semen.

A list of hazards retained for risk assessment in the queen bee review included a range of pests and diseases including bacteria, viruses and DNA such as African bees and Cape bees. It was stated that acute paralysis virus, deformed wing virus and slow paralysis virus can be transmitted via semen. However the queen honey bee review found that the absence of varroa mites as a vector meant that the unrestricted risk of these viruses was negligible. These viruses, if they aren't already in Australian stock, may well come in through the importation of live queen bees anyway.

The primary risk associated with the importation of drone honey bee semen was from the DNA of Africanised honey bees or *Apis mellifera scutellata* and its hybrids.

A.m scutellata bees have a very high reproductive rate, can be extremely defensive and regularly swarm – migrating across the countryside. From 1954 to 1956 there were various imports of *A.m scutellata* honey bees into Brazil. For various reasons, bees were released into that country and quickly spread throughout Brazil. This bee is now regarded as being thoroughly distributed throughout Central America, the southern areas of North America including Mexico, the Southern USA and South America, but restricted to the northern parts of Argentina.

African bees first invaded the United States of America in 1992. This particular bee invasion throughout the Americas is regarded as one of the most successful biological invasions of all time. *A.m scutellata* was expected to increase its range into the northern US states, especially along the eastern seaboard, however as time goes on this expansion seems less likely.

Wherever *A.m scutellata* has spread, it tends to replace the European honey bee stocks. This has been achieved primarily by the bee producing large numbers of reproductive swarms and drones. One observation listed in the risk assessment document is that *A.m scutellata* colonies can produce six to twelve reproductive colonies per year. The offspring from these colonies can then further produce more colonies and up to sixty (60) descendant colonies can be produced in one year from a single invasion from one *A.m scutellata* colony.

An interesting observation is that *A.m scutellata* is resistant to some degree to the major pests of European honey bees, particularly small hive beetle and varroa. It is not surprising that *A.m scutellata* has a resistance to small hive beetle as they both originate in South Africa, providing an evolutionary explanation for this resistance.

The varroa tolerance, or resistance of African bees, is a more interesting scientific point – the brood reproductive time period is slightly less in *A.m scutellata* than European bees and its tendency to readily swarm would interrupt the breeding of varroa

The main issue with *A.m scutellata* is that the colonies become extremely defensive. Colonies need to be placed at least two hundred, if not five hundred, metres away from locations occupied by livestock, companion animals or people. For instance, in Mexico between 1988 and 1998, there were 480 deaths recorded due to multiple honey bee stings. In this sort of environment it is very likely the private and public land holders will be very reluctant to allow beekeeping activities and the placement of apiaries on their properties.

A.m scutellata is a very similar looking bee to the European honey bee and there is not sufficient difference between the bees, on eyeballing them both, to reliably distinguish either. Interestingly, small colonies of *A.m scutellata* are often not aggressive which can also be confusing and lead to misdiagnosis. Morphometrics, the study of the size and shape of the bee, can be used to differentiate African bees from European bees. Unfortunately, with hybrids, this can be a bit of a problem and therefore morphometrics is not regarded as a very reliable mechanism to determine Africanisation.

DNA testing is available but only provides information about the maternal ancestry. It is important to test both the nuclear and mitochondrial genomes for *A.m scutellata* genetic origin.

Since the risk assessment was completed for the importation of queen bees in 2012 there has been a scientific paper published by the University of Sydney, which developed a more advanced test using SNP genotyping technology. This technology is able to differentiate between honey bee lineages. (The reference is Chapman NC, Harpur BA, Lim J, Rinderer TE, Allsopp MH, Zayed A, Oldroyd BP (2015) A SNP test to identify Africanised honeybees via proportion of 'African' ancestry. Molecular Ecology Resources.) The risk assessment indicates that this methodology will be assessed in further detail as to its potential to be used as a diagnostic test for importation of both drone honey bee semen and queen honey bees from areas where Africanised bees are present, such as the USA.

If Africanised bees were to establish in Australia, the risk assessment indicates that the restriction of movement other than either into or from Western Australia or Tasmania is likely to be futile and would cause significant disruption to the beekeeping industry. This is an interesting comment in relation to an outbreak of any other pest or disease on the east coast of Australia and the restriction of movement across eastern state borders.

In the assessment process the risk of importing *A.m scutellata* semen was regarded as moderate and the likelihood of susceptible honey bees being exposed to Africanised honey bee genetics via imported honey bee semen was estimated to be high. The majority of Australia is likely to be suitable for the establishment of Africanised bees based on the American experience. This bee prefers the warm dry savannah environment that Australia has in proliferation.

In conclusion to the risk management report draft policy review, the Federal Department of Agriculture considers a country or zone freedom is a suitable risk management option for Africanised honey bees. In the report, New Zealand, Japan and the European Union are listed as countries that we could allow the importation of semen from without further testing.
The Federal Department of Agriculture intends to release a further discussion paper on the risk to the current quarantine arrangements if the University of Sydney test is adopted. Drone honey bee semen out of Canada and USA could be imported into Australia, if or when the appropriate risk assessment is complete.

<u>Proposed requirements for the importation of drone honey bee semen</u>

Importation would be restricted to approved host countries only, as stated – New Zealand, Japan and EU. Documentation will be required - a written application to import honey bee drone semen must be lodged with the Department of Agriculture prior to any import proceeding. Each consignment must be accompanied by a valid import permit and an original international veterinary health certificate consistent with the OIE code, signed by a government apiary officer or an official veterinarian of the country of export.

Any inadequacies with this paperwork may mean the destruction of the semen without recompense to the importer.

In the draft, it is proposed that in the case of consignments of semen originating from countries free from Africanisation or *A.m scutellata*, that no post arrival measurements will be required. It is envisaged that, after border clearance, imported drone honey bee semen will go directly to the place of insemination, which in most cases will be honey bee breeding operations.All of this sounds very encouraging to provide another alternative means of importing genetic material into Australia. It is likely that this may be of value or benefit to the Australian beekeeping industry in the event of an incursion and establishment of varroa mites. This particular mite has proven to be the major beekeeping problem around the world, including New Zealand. In New Zealand it was first detected in the North Island in 2000 and then spread to the South Island in 2006.

There are several advanced bee breeding programs in various countries around the planet, focused solely on breeding a varroa tolerant stock. It would be in Australia's best interest to be able to obtain the genetics from these particular breeding programs in the event of Australia requiring a quick launch into varroa tolerant stock breeding program.

As an extra benefit, the availability of such stock in Australia would also provide another market for the export of such stock to various countries in the northern hemisphere. Historically, Australia has sold many thousands of packages and queen bees into the northern hemisphere markets in our autumn. Hopefully the Sydney University research will be looked favorably on by the Australian Government Department of Agriculture and it will allow us to import drone honey bee semen from Canada and the USA.

Unfortunately this draft policy review, which is available on the web, had to have any comments returned by 1 December 2015. Thus, by the time you read this article that date will have passed. Even so, this is all a very positive forward step for the beekeeping industry and will allow more options for beekeepers in NSW and Australia to source breeding material outside of this country.

It is envisaged that the whole process should be completed by the first half of 2016.

Note: the final document may not be identical to the draft as the Federal Government Department of Agriculture will need to take into consideration any feedback for the consultation process.

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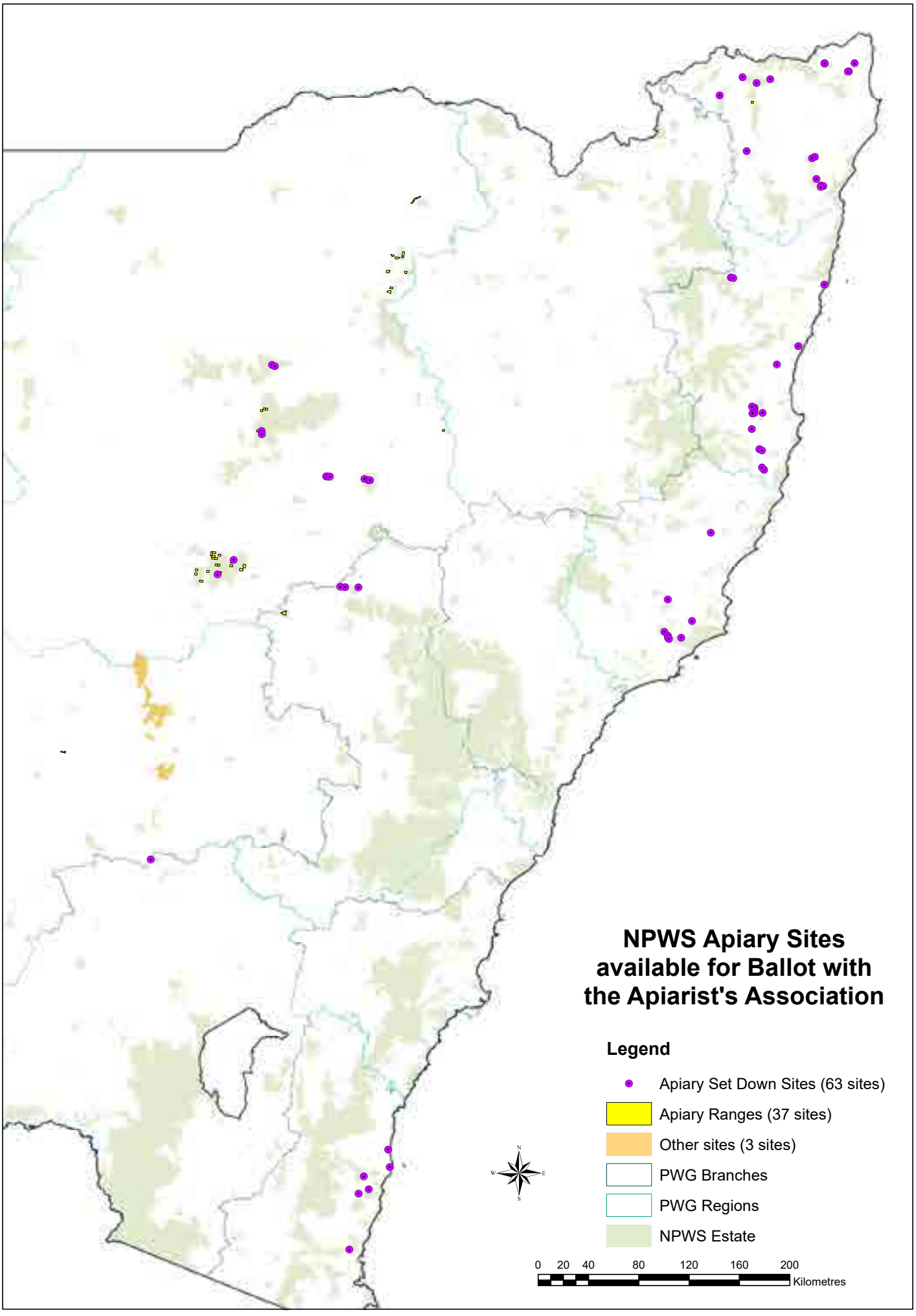
NPWS SITES BEING RETURNED TO INDUSTRY

The NPWS has identified these sites as being available to be returned to industry.

A ballot will be held as soon as possible in the New Year.

Region	Area	Reserve	No. of sites
Blue Mountains	Mudgee	Durridgere CCA Zone 3 State Conservation Area	3
Far South Coast	Central	Biamanga National Park	2
Far South Coast	Central	Kooraban National Park	1
Far South Coast	Merimbula	South East Forest National Park	1
Far South Coast	North	Eurobodalla National Park	2
Lower North Coast	Great Lakes	Ghin-Doo-Ee National Park	1
Lower North Coast	Great Lakes	Myall Lakes National Park	6
Lower North Coast	Manning-Hastings	Goonook Nature Reserve	1
North Coast	Clarence South	Yuraygir National Park	1
North Coast	Coffs Coast	Bongil Bongil National Park	1
North Coast	Coffs Coast	Jaaningga Nature Reserve	1
North Coast	Coffs Coast	Ngambaa Nature Reserve	7
North Coast	Dorrigo Plateau	Chaelundi National Park	2
North Coast	Macleay	Cooperabung Creek Nature Reserve	2
North Coast	Macleay	Kumbatine National Park	2
North Coast	Macleay	Skillion Nature Reserve	1
Northern Plains	Baradine	Pilliga CCA Zone 3 State Conservation Area	2
Northern Plains	Baradine	Timallallie CCA Zone 1 National Park	7
Northern Plains	Coonabarabran	Goonoo CCA Zone 1 National Park	5
Northern Plains	Coonabarabran	Goonoo CCA Zone 3 State Conservation Area	14
Northern Plains	Coonabarabran	Somerton CCA Zone 1 National Park	1
Northern Plains	Coonabarabran	Tinkrameanah CCA Zone 1 National Park	3
Northern Plains	Coonabarabran	Trinkey CCA Zone 3 State Conservation Area	3
Northern Plains	Coonabarabran	Yarrobil CCA Zone 1 National Park	1
Northern Plains	Narrabri	Bullala CCA Zone 1 National Park	3
Northern Plains	Narrabri	Terry Hie Hie CCA Zone 2 Aboriginal Area	8
Northern Rivers	Clarence North	Bundjalung National Park	3
Northern Rivers	Clarence North	Mount Pikapene National Park	1
Northern Rivers	Richmond River	Bundjalung State Conservation Area	1
Northern Rivers	Richmond River	Bungawalbin National Park	2
Northern Rivers	Tweed-Kyogle	Mooball National Park	1
Northern Rivers	Tweed-Kyogle	Mount Jerusalem National Park	2
Northern Rivers	Tweed-Kyogle	Richmond Range National Park	1
Northern Rivers	Tweed-Kyogle	Toonumbar National Park	3
Northern Rivers	Tweed-Kyogle	Wollumbin National Park	2
Northern Rivers	Tweed-Kyogle	Yabbra National Park	1
Southern Ranges	Murrumbidgee	Bendick Murrell National Park	1
Western Rivers	Central West	Goobang National Park	2
Western Rivers	Central West	Lachlan Valley National Park	1
Western Rivers	Central West	Nangar National Park	1
		TOTAL	**103**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Apiary Ranges (37 sites)
Other sites (3 sites)
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NICK'S NEWS from DPI NSW

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USE OF SMOKER DURING FIRE BANS

Whilst delivering the Beginning in Bees course at Tocal on the 20-21/10/15 we taught the participants how to light and use a bee smokers in a safe effective manner. This is all fairly mundane stuff for experience beekeepers. But for people new into beekeeping we highlighted the risks involved in the lighting, using and extinguishing smokers. Obviously this is very poignant leading into the high risk fire danger period of the year. This led to the question of the use of smokers during total fire bans. Investigation on the Rural Fire Service internet site, I found mention of exemptions during fire bans, but it was not easy to locate the actual exemptions and the conditions that apply to the exemptions. Wanting to provide clarification to all beekeepers on this point I phoned the NSW Rural Fire Service and spoke to Kristy-Lee Tenbosch – Senior Operational Communications Officer who informed me of the exemptions and conditions around those exemptions for using beehive smokers.

The RFS web page states - A range of activities may be exempt from Total Fire Bans, such as emergency infrastructure work, bee hive smokers, mining operations, sugar cane harvesting, and use of fireworks or ceremonial fires. The NSW RFS Commissioner is responsible for exemptions to Total Fire Bans. These exemptions are detailed in the NSW Government Gazette each time a Total Fire Ban is declared.

So to locate these exemptions you need to look through the gazettes but I have listed the relevant exemption for using bee smokers below.

A notification was made under S**ection 99** of the **RURAL FIRES ACT 1997** (Web address. http://www.austlii.edu.au/au/legis/nsw/consol_act/rfa1997138/). It lists the exceptions to the rule for Total Fire Bans and has conditions for use of each of those exceptions. The exceptions include Schedule 10 – Bee Hive "Smokers"

SCHEDULE 10 - Bee Hive "Smokers"

Fire lit and maintained in a metal canister, known as a "bee hive smoker" used by apiarists to produce smoke for use in connection with the management of bees and bee hives, provided that:

(a) the canister is a commercially available "bee hive smoker" designed to prevent the escape of sparks or incandescent or burning material;

(b) the fuel for the canister is lit inside a building or vehicle by a responsible adult person and the canister is sealed prior to leaving the building or vehicle and being taken to the hives;

(c) fire, sparks or incandescent or burning material is not permitted to escape from the canister in the open air;

(d) the canister is not to be left unattended while it is alight;

(e) the fuel is totally extinguished inside a building or vehicle by the

(f) responsible adult person at the completion of use.

Even though beekeepers can light bee smokers as per the conditions listed above in total fire bans, I strongly recommend that this exemption only be used in extreme situations. Such as when a fire is threating to burn your hives and they need to be relocated urgently. Otherwise I suggest all beekeepers comply with total fire bans and avoid using smokers during these times. Go and do some shed work or go for a swim instead. A fire that can be followed back to starting next to your hives would be embarrassing and possibly costly.

Obviously as beekeepers who are continually lighting and extinguishing smokers, you are using common sense when doing so to minimise the chances of starting a fire. But please just take a bit more caution over the summer. I do urge all beekeepers to carry some firefighting equipment (eg knapsack full of water, fire extinguisher, fire rake etc.) and have it close by and ready for use whenever using a smoker.

THE FROST REPORT

Elizabeth Frost
E. Frost Apicultural Services
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EDUCATION ABROAD: LEBANON

In July 2015 I had the opportunity to work as an independent consultant for Development Alternatives Inc. (DAI), a subcontractor for US Agency for International Development (USAID). I was tasked with studying the feasibility of a honey bee breeding center in Lebanon and to assist with the work of the Lebanon Industry Value Chain Development (LIVCD) —Honey Chain. My assignment during this three week, in-country contract involved:

1. training in artificial insemination of queen bees
2. beekeeper and apiary visits and assessments
3. educational presentations on queen bee breeding
4. providing recommendations and guidelines for the operation of a queen breeding center

Figure 1
A mating apiary in Ouyoun El Siman at 1,200 meters elevation in the Mount Lebanon Governorate.

Background: Lebanese Beekeeping Industry
Lebanon produces low volumes of honey, for a market value of between US $21 and US $26 million annually, according to DAI. Despite these relatively small market values, the LIVCD honey value chain engages large numbers of rural poor Lebanese households, who can easily participate in honey production.

Lebanese beekeepers operate Italian bees, *Apis mellifera ligustica*, and the native honey bee *Apis mellifera syriaca* which is generally referred to as Syriaca. The four major honey crops are derived from oak honeydew, clover, various thistle species or كوشلا, and orange blossom. At present beekeepers do not receive payment for crop pollination services in Lebanon.

Figure 2
Beekeeper visits, apiary assessments, presentations and trainings were held at locations noted by red dots. These locations were chosen strategically in order to assess the beekeeping situation in different regions of the country.

Findings and Recommendations
The following is an excerpt from my formal trip report. These findings and recommendations were gleaned from the research of my LIVCD colleagues and my personal communication and interviews with Lebanese and California queen bee breeders and previous professional experience in the beekeeping industry in the US and Australia.

FINDING 1:

The 2016 queen bee market potential in Lebanon is 275,000 queen bees annually, considering 274,390 hives currently on record is likely an underestimate. Aside from a country-wide underestimation of hives, an increase of 610 hives in 2016 is attainable, given the annual practice of hive splitting, that is creating two hives from one, as a result of spring hive population increase and management. The fact that a hive is at top honey production capacity when headed by a young, healthy queen supports a queen production output equal to the total number of hives in the country.

The conservative estimate for queen bee market potential in Lebanon is 100,000 queen bees annually due to the fact

that many beekeepers in Lebanon are stationary, leaving their hives in one location from year to year. In this case replacing the queen every two years is advisable.

Recommendation 1.1—Personal communication and first-hand experience is the best tool for marketing queen bees. Historically this is much more valuable in the beekeeping industry than a flashy website. I anticipate each of the three identified queen breeders (Mr. Afif Abi Chedid, Mr. Tarek Yassin and Mr. Souheil Kadamani) will grow their customer base, slowly at first, so long as the quality of their queen bees remains as it was during my trip.

FINDING 2:

There is currently a market for at least 15,000 queen bees in Lebanon. This is determined by the fact that 15,000 queen bees are imported annually and purchased by Lebanese beekeepers. Despite this importation, "small farmers do not have access to good quality queens," as noted in the Independent Consultant Scope of Work for the Bee Breeding Center Feasibility Study.

Recommendation 2.1
The three identified queen breeders could displace the need for the 15,000 imported queens by producing as many queen bees within Lebanon and at the same time service the small farmers that currently do not have access to good quality queens. Changes in management practices are necessary to make production of this large quantity of queen bees possible. See **Annex III: CALENDAR OF OPERATIONS** for the necessary management for commercial queen production in Lebanon over one year.

The ability to displace the 15,000 imported queens with high quality, Lebanese-produced queen bees relies primarily on the three queen breeders':

1. Quantity of hives (That is, the population of bees and quantity of equipment, both full-size support hives and nucleus colonies)
2. Skilled laborers
3. Access to feeding supplements

Quantity of hives (That is, the population of bees and quantity of equipment, both full-size support hives and nucleus colonies)
All nucleus colonies seen in Lebanon were 5-Frame, full-depth frame nucleus colonies. This design does not sacrifice honey production and is well-suited to the Lebanese beekeeper's aim to produce as much honey as possible. **An estimated maximum 7 rounds of queens can potentially be caught in each 5-Frame nucleus colony over the lengthy Lebanese queen production season.** This estimation is in consideration of a 70% catch rate. The 70% catch rate reflects California queen breeders' annual predictions and the reality that prolonged inclement weather incidents can decrease the number of queens that mate successfully in the beekeepers' timeline of 21-days between queen emergence as a virgin to a laying adult ready to catch and cage for sale.

Other benefits from the large size of a 5-frame nucleus colony are that it can be:

- Sold as a complete hive
- Overwintered in certain locations for convenient use in the spring
- Useful for drawing out foundation
- A unit that is completely compatible with the frame size in full hives
- A honey production unit
- A source of capped brood frames for possible sale

One potential new product for the Lebanese beekeeping industry is capped brood frames. Capped brood frames are sold for $15 USD in California and are a common purchase before almond pollination in order to quickly boost the population of a hive to increase its potential forager population prior to almond bloom. This is the most lucrative pollination contract for US beekeepers. The same practice could be useful for Lebanese beekeepers seeking to increase their hive populations prior to a nectar flow in order to maximize their honey production.

Skilled laborers
One skilled laborer should be able to work 50, 5-Frame nucleus colonies per day. That could mean catching 50 queens one day, introducing 50 queen cells the next day, pulling a frame of honey another day, etc. At least one employee should be grafting full-time if the goal of the queen breeder is to produce a few thousand queens during the production season.

Laborers for a 2,000 hive queen breeding business:

- Grafter
- Queen catching crew
- Cell introduction and nucleus colony feeding crew

Access to feeding supplements
For California queen breeders, the cost of feeding sugar syrup is insignificant in comparison to the gain from queen sales. California queen breeders see feeding as a necessity not an expense. Sugar syrup can be purchased pre-mixed by the tanker-load if needed in California. Lebanese beekeepers must determine, if available, the cost of pre-mixed sugar syrup, feasibility of transport (i.e.-delivered to storage tanks at a fixed location, pick up with a tank on the beekeeper's truck from the syrup sales office, appropriate pump to get syrup from the tank on the truck into a nucleus colony, etc.). SEE RECOMMENDATION 3.1

FINDING 3:

Lebanon's unique climate and geography allows for the production of queen bees from February through August in different regions within the country (pers. comm.). In South Lebanon queen bees can be produced from February through July. In Ouyoun El Siman queen bees can be produced from March through July. In Rashaya El Wadi queen bees can be produced from April through August.

Recommendation 3.1
To maximize queen quantity and quality a few key management steps should be adopted:

- Sugar syrup and pollen supplement feeding to drone mother colonies, as needed, directly before the queen production season and during the queen production season if there is an absence of fresh nectar and pollen. This is a vital practice to ensure drones with specific characteristics the bee breeder has selected in their operation are in great quantity, alive and healthy to mate with the queens in cases of both artificial insemination and natural mating.
- Nucleus colonies from which queens will be mated should be fed sugar syrup every time a new queen cell is introduced. This addition will maximize nucleus hive productivity as it is difficult for small colonies

such as these to forage for their needed nectar requirement, especially if there is a prolonged break in the brood cycle. Queen producers in California who produce thousands of quality queens every year feed sugar syrup to their nucleus colonies every time a cell is introduced to maintain good food levels in the hive and to simulate nectar flow conditions which will make a queenless hive accept a new queen cell and care for the emerging virgin more readily than a food-stressed or starving hive.

- For California queen breeders, the cost of feeding sugar syrup is insignificant in comparison to the gain from queen sales. California queen breeders see feeding as a necessity not an expense.

Figure 3: *At 1,300 meters elevation, this apiary near Rachaya El Wadi, located in the Beqaa Governorate, is used for queen production and thistle honey production between April and September.*

FINDING 4:
Lebanon's unique climate and geography allow beekeepers to transport their hives within the country for honey production during most months of the year (weather permitting). The current high number for hive transportation events within Lebanon is five moves per hive.

Multiple hive transportation events support the practice of annual queen replacement, but potentially undermine the ability to maximize queen production at a fixed location.

Recommendation 4.1
Education on annual queen replacement for migratory commercial beekeepers should increase. The high number of hive moves throughout the honey production season supports the practice of annual queen replacement in these migratory colonies. This practice of annual queen replacement enables beekeepers to maximize honey yields as a hive led by a young, healthy, well-mated queen will produce more honey than a hive led by a 2 year old queen in the same apiary. This practice will support the Lebanese queen market as well as honey producers, Lebanese domestic and export honey markets.

Two out of the three Lebanese queen breeders identified in this study transport their colonies throughout Lebanon, following nectar flows and/or good conditions for queen production. In the US, queen producers have their queen production season in a fixed location, with some queen breeders producing upward of 10,000 queens annually. This entails much supplemental feeding of sugar syrup and pollen as well as inputs of brood and bulk bees for cell builders as they cannot rely on natural pollen and nectar flows to supply their breeder colonies, cell builders and nucleus colonies with adequate nutrition for their scale of queen production. US queen breeders routinely have a fixed warehouse with a breeder yard directly next to a building used only for grafting and incubating queen cells. Most mating apiaries are within 50 kilometers of the warehouse. This typical US queen breeding operation set-up maximizes queen production capacity.

It is likely that in Lebanon, queen breeders will continue to produce queens both in early spring South Lebanon locations and in early to late summer locations in higher altitude regions (i.e. - Ouyoun El Siman, Rashaya El Wadi). While this may reduce queen production capacity it is beneficial in the sense that queen production exists in both locations to (i) utilize natural nectar and pollen flows for better nutrition and to (ii) provide easy queen pickup to customers in multiple regions.

As the Lebanese queen market for domestic queen sales is untested, I anticipate the two identified migratory queen breeders, Mr. Afif Abi Chedid and Mr. Souheil Kadamani, to continue raising queens early in South Lebanon before raising queens in their high altitude locations in Ouyoun El Siman and Rashaya El Wadi respectively. As demand grows Mr. Afif Abi Chedid and Mr. Souheil Kadamani may find it easier to focus their queen rearing efforts based out of a single location, the Hosrayel Bee Breeding Center and proposed breeding center in Rashaya El Wadi, respectively. Given that queens are not currently shipped by post within Lebanon, continuing some queen production in South Lebanon mating apiaries may have the advantage of being able to sell queens, queen cells, virgins, and nucleus hives to beekeepers in the south who may not otherwise travel either to Hosrayel or Rashaya El Wadi to make this purchase.

FINDING 5:
Mr. Afif Abi Chedid is in a good position to run a bee breeding center. His quantity of hives, determination, willingness to learn, reliable employee labor, and beekeeper connections in Lebanon and abroad are his main assets. Next steps are continuous practice with artificial insemination technique and adherence to pre- and post-insemination procedures and trait selection to determine if he and Mrs. Ariane Abi Chedid can succeed in incorporating artificial insemination of queen bees into their business.

Recommendation 5.1 – It is generally considered that after inseminating the first 50-100 queens, as well as collecting drone semen for the procedure, the beekeeper will have mastered the technique. Mr. Afif Abi Chedid should be prepared to practice with as many as 50 queens before the technique is mastered.
E. Frost Apicultural Services will continue to answer any questions Mr. Afif Abi Chedid has and forward educational material to ensure proper procedures are followed for successful artificial insemination of queen bees. In addition to mastering the technique, appropriate queen banking, nucleus colony set-up and introduction of artificially inseminated queens is of equal importance for successful insemination and ensuring queen longevity.

Next Steps
In 2016 Lebanese queen breeders will seek to legally import artificially inseminated queens selected for Varroa Sensitive Hygiene trait in an effort to incorporate genetic traits into their integrated pest management (IPM) strategy for Varroa.

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EXPRESSION OF INTEREST FOR PARTICIPATION IN CHALKBROOD RESEARCH

Dear Fellow Beekeepers
I am writing to you to request your participation and assistance with chalkbrood research that I am conducting as part of my PhD Studies with La Trobe University in partnership with the Rural Industries Research & Development Corporation (RIRDC) .

This letter details the problems associated with chalkbrood in Apis mellifera colonies and describes my proposed studies. In total I'm seeking support from 17 proactive industry beekeepers (1 to 3 beekeepers from each state).

Western Australia	2
Northern Territery	1
South Australia	3
New South Wales	3
Victoria	3
Tasmania	2
Queensland	3
TOTAL	17

Please read through this information and contact me if you are interested in participating in this meaningful and valuable project. Your support would be greatly appreciated.

Kind regards,
Jody Gerdts, *Bee Scientifics*

INTRODUCTION
Chalkbrood is caused by *Ascosphaera apis* which belongs to a genera of spore-cyst forming entomopathoniginic fungi associated with the larvae of social and solitary bees of the superfamily Apoidea. The fungus' spores germinate in the gut of the developing larvae. The hyphae puncture the gut lining and form mycelia on the outer surface of the larvae. The dead larvae dries and hardens into chalky looking mummies, hence the name chalkbrood. There is evidence that *A. apis* may infect multiple bee species and there may be crossover from managed honey bee populations to native bee populations.

Historically, chalkbrood infection was regarded as a minor stress induced honey bee disease thriving in damp, cool spring conditions clearing up by summer. As there are no chemical treatments for chalkbrood, it was usually resolved through the best management practices of keeping dry, well ventilated, nutritionally resourced and populated colonies and to use hygienic lines of bees.

However, interestingly, Australian apiarists report that the prevalence and severity of chalkbrood infections has increased over the last four years and globally scientists are labeling it the most contagious and destructive disease that affects honey bee brood. Indications suggest that chalkbrood incidence may be on the rise. It has been estimated that up to 37% reduction in honey production is due to chalkbrood infections.

PROJECT DESIGN
This project is part of my PhD studies at La Trobe University investigating social and innate resistance to chalkbrood infections in Australia and is funded by a RIRDC grant.

I am looking for 1 to 3 beekeepers from each state to participate in this three-year study. Beekeepers will be given detailed sampling instructions along with sampling kits to collect infected larvae twice a year for three years.

In addition to sampling, beekeepers will be asked to participate in an online questionnaire to collect information about resource availability and management practices. The minimal time commitment for this project should be no more than 10 hours twice a year.

PROJECT AIMS
The aim of this study is to:

- Identify factors that contribute to increased chalkbrood outbreaks
- Investigate if there are different strains of *Ascosphaera apis* in Australia
- Identify strains that may be more virulent than others

PARTICIPANT REQUIREMENTS
Participating beekeepers are requested to meet the following criteria:

- Current registration with their relevant state DPI (if applicable);
- Owning 50+ colonies;
- Kept bees for at least 10 years;
- Move colonies less than 150 km radius (negotiable);
- Can identify early stages of chalkbrood infection (training provided);
- Has knowledge of local flowering habits;
- Can keep detailed notes;
- Can complete online surveys;
- Can commit to sending samples twice a year for three years.

CONTACT INFORMATION
If you are interested in participating in this study, please contact me at 0427 075 662 or by email at beescientifics@gmail.com. I look forward to hearing from you.

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SYDNEY BRANCH QUEEN GRAFTING & INTRODUCING MATED QUEENS TO ESTABLISH COLONIES COURSE

The Sydney Branch of the NSW Apiarist Association organized a two day course held at The Illawarra Amateur Beekeepers Association club facility at Sutherland in November.

The course was booked out with limited publicity so another course will be held early next year.

The course covered Queen Rearing Principles with the students preparing queen right and queenless cell feeders and starters, covered the importance of nutrition, pests and diseases, various types of grafting tools, prepared cell bars, points to consider for managing breeders, queen selection, breeders and drone mother colonies, types of nucleus colonies, mating yard design drone congregation areas.

All of the students grafted queen cells on both days and were able to see the results and if they wished were able to take started queen cells home for use in their own apiaries.

The branch also obtained on consignment queen rearing equipment from Hornsby Beekeeping Supplies and Tobin's that students appreciated being able to purchase.

Beekeepers attending were from the Amateur Beekeeping Association branches, NSW Apiarist Association branches and North shore Beekeepers Association.

Sydney branch Committee members who helped were President Paul Drew, Vice President Doyle Egelhoff Secretary Tanya Ananin and Committee member Peter Ives and Lamorna Osborne. Dr Lamorna Osborne also gave a very detailed power point presentation on the use of honey to treat wounds and ulcers.

All the students were provided with a memory stick that contained comprehensive information on Queen Rearing the RIRDC DVD's on Selection of Bee Sites, AI of Queen Bees and Requeening Hives.

Six methods of introduction queen bees to colonies were demonstrated.

School of Grafting

Finding the Queen

Class grafting table

The course was delivered by Bruce White with a strong practical emphasise, who had over 20 years experience managing the Commonwealth Honeybee Quarantine facility at Eastern Creek where all imported Queens bees were held in flight cages.

Bruce has a Certificate IV in Work Place Training and Assessment

If you are interested in enrolling for the next course that will be restricted to 15 and held early next year please contact: Paul Drew Phone 02 9887 1175, Tanya Ananin Phone: 0414 501 198 or Email: sydneybranch@nswaa.com.au

The branch intends to offer practical training courses on special topics on demand. The course evaluation by the students was very positive.

A special thanks goes to the Illawarra Amateur Beekeeping Association for the use of their excellent facilities and apiary.

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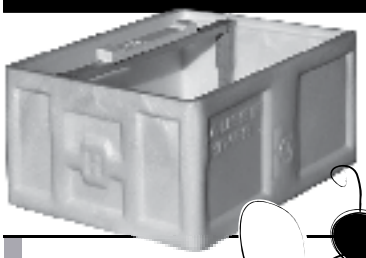

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BIOSECURITY WORKSHOP BATHURST

In October the Central Tablelands Local Land Services (LLS) held a valuable workshop on biosecurity for beekeepers.

Pests and Diseases of Honeybees was presented by respected industry specialist Bruce White and NSW DPI's Nick Annand who shared their wealth of experience and practical advice.

Australia is free from devastating pests such as Varroa mite and our honey producers are very keen to keep it that way.

The workshop gave participants the knowledge and practical skills to check their hives for a number of pests and diseases; they learnt how to contain and manage any production problems and how to notify NSW Biosecurity if they suspect an exotic incursion.

Central Tableland NSW Apiarists' Association supported the event.

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NEW TRAINING VIDEOS TO BOLSTER PRODUCTIVITY

With hundreds of beekeepers starting out in the industry each year, training is vital to ensure they learn and follow best practice when it comes to the basic skills.

A series of new videos is now available online and will be provided to Registered Training Organisations offering relevant courses, with all of Australia's estimated 12,400 registered beekeepers encouraged to pursue these educational opportunities.

The videos have been funded by the Honey Bee and Pollination Program, a partnership between the Rural Industries Research and Development Corporation (RIRDC), Horticulture Innovation Australia Limited (HIA) and the Australian Government.

They cover:

- the construction and repair of beehives
- selecting and establishing apiary sites
- providing pollination services
- re-queening a honey bee colony
- artificial insemination

Beekeeper and spokesman for the Program, James Kershaw, says education is important for the long-term future of the industry.

"To maintain our honey production and provide effective pollination services, we need every beekeeper to continually add to their skills, improving the way they manage their hives and deal with pests and diseases," Mr Kershaw said.
"Unless we are operating at best practice to manage the issues we're already facing, an exotic pest or disease incursion will have a greater impact on beekeepers' costs, their productivity and their ability to move hives around Australia.
"These videos very clearly and simply explain a specific set of skills, and why those skills are necessary for beekeepers, as well as the tools required and how to use them."

The videos have been produced to align with the accredited Certificate AHC 32010 in beekeeping and Certificate AHC 10 in Agriculture. They are available on the RIRDC YouTube channel: (www.youtube.com/RIRDC). For more information about the Honey Bee and Pollination Program visit www.rirdc.gov.au/honeybee-pollination.

Stay up-to-date with the latest news and information about beekeeping and pollination with the BeeAware e-newsletter. Go to beeaware.org.au/subscribe.

Media contact: Kaaren Latham 02 8204 3852

2016 ANNUAL CONFERENCES

Queensland	13 - 14 July	Townsville
New South Wales	12 - 13 May	Albury
Tasmanian	27 - 28 May	St. Helens
Western Australia	6 May	TBA
South Australia	16 - 17 June	Kangaroo Island
Victoria	8 - 9 June	Wangaratta

Honey Packers and Marketers Association	TBA
National Council of Pollination Associations	TBA
Australian Queen Bee Breeders Association	TBA
Australian Honey Bee Industry Council	15 July

AHBIC AGM
The AHBIC AGM will be held in Townsville on Friday 15 July 2016 following the QBA conference on the preceding Wednesday and Thursday. Details on accommodation etc. will be in future newsletters when the information comes to hand.

POSSIBLE ARTHRITIS TREATMENT USING PROPOLIS

Courtesy*: Catch the Buzz*
15 November 2015

Researchers at the University of Moncton, New Brunswick, Canada are buzzing over the possibility that honey bees could help them unlock a new treatment for inflammatory diseases, such as arthritis.

Dr. Luc Boudreau is leading the project, which explores the medical properties of a material called propolis, which is a resin collected from tree buds by honey bees.

Boudreau has identified a compound in propolis that reduces inflammation in laboratory tests. He said the early tests conducted by his team are promising.

"When we did in-vitro tests, this compound is actually better than most compounds that are already out there on the market," he said.

Boudreau and his three-person research team are awaiting approval from Health Canada before beginning clinical trials of their product. They are hoping to have approval in the next three months.

If the trials are a success, there is a growing market for the treatment. Nearly 20 per cent of New Brunswick's population is over the age of 64 and it is estimated that more than 125,000 people in the province suffer from arthritis.

Krista Phillips, the community education coordinator for the Arthritis Society, said the number of citizens living with arthritis is going to increase with an aging population.

"We'll be watching this project very closely, with great interest because hopefully it leads to big things for people living with arthritis," she said.

Research Grant
Boudreau's research team was recently awarded $75,000 from the New Brunswick Innovation Foundation to go toward research into therapies for inflammatory diseases.

The researchers already have a company name, NaturoBee Ltd. and they're looking for partnerships with investors and beekeepers across the province. They hope to have a product on store shelves in about three years.

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WHAT'S HAPPENING TO THE BEES - PART 1

by Randy Oliver - ScientificBeekeeping.com

I'm realizing that what I thought was going to be a quick review of CCD has turned into a very long series of detailed articles, and I'm not even near reaching the conclusion. So on this 20th anniversary of my first seeing the parasite that changed beekeeping worldwide, I thought that I'd interrupt the Sick Bees series and attempt to explain, more briefly (hah!), and from an ecological perspective, what's happening to the bees these days, and how beekeepers are being forced to adapt.

One Wild Ride!

In 1994 I saw my first varroa mite—on a stickyboard that had been placed by the county bee inspector under one of my hives. Little did I know how much that little maroon speck was about to change my life!

Varroa clobbered me (or more precisely my bees). And then did it again; and then again. I finally got pissed off and decided that I should either give up beekeeping altogether, or dust off my scientific training and really learn about bee and mite biology, and how to apply it to practical beekeeping.

What's interesting is that my very first article (on almond pollination), in the fall of 2006, was published just as Dave Hackenberg's colonies began to collapse from CCD. The occurrence of CCD put the bee research community into high gear to try to figure out what the heck was happening. And that created a "niche" for a practical beekeeper with a biological background, willing to act as a translator of the scientific findings to an alarmed beekeeping community. I unwittingly stepped into that niche, and it swallowed me up. A mere seven years later, and to my utter surprise, I've gone from being an obscure sideline beekeeper to a globetrotting speaker on bee health and management.

I've now been fortunate enough to visit both professional and recreational beekeepers in every part of North America and in several other countries. I've seen many styles of beekeeping, from the tropics to the Arctic, heard the local problems and concerns, and had the chance to learn from some very smart and successful beekeepers. I've attended scores of conferences, read countless scientific papers, and picked the brains of the world's best apicultural researchers. Then I've done my best to share what I've learned with others. I've met scores of wonderful people and made a lot of new friends, and I'd like to take this opportunity to thank you all for the appreciative and effusive support!

How we've benefitted from CCD

CCD has been a mixed blessing to beekeepers. It brought grown men and women to tears (see the film *The Last Beekeeper* [1]), and the elevated rate of colony mortality in recent years has made it difficult to keep our operations in the black. But it also pushed our scientific community to learn more about the biology of the honey bee than they had in a great many years. And many of us are much the better beekeepers for it.

Unlike that of other livestock, the true contribution of pollinators to U.S. agricultural production is not reflected by farm gate sales figures, so bees have traditionally not received their fair share of USDA research funding, nor does the beekeeping industry have the lobbying clout of the cattle, poultry, or pork producers. But we've benefitted from the public awareness of the plight of pollinators, which has resulted in the shifting of some funding our way [2] (although bees still only get about a tenth the amount of money set aside for research on beef production). In addition, universities, grantors, and other governments have recently supported a great deal of research into honey bee and pollinator health (I only wish that the millions who signed the internet petitions to "save the bees" had instead each donated a single dollar toward bee research).

Misunderstanding and Misinformation

Although CCD refers to a specific set of symptoms [3], the media soon began to use the term for any sort of honey bee mortality (as did many beekeepers). And although the epizootic appears to have largely run its course, speculation ran rampant as to the cause(s) of "CCD," and continues to do so with every new "documentary" and press release. Although "CCD" remains the poster child of colony losses, a blue-ribbon group of bee researchers cautions:

During the winter of 2008/2009, □10% of the 2.3million managed honey bee colonies in the US died with "CCD-like symptoms", and US beekeepers self-diagnosed CCD as only the 8th most important contributor to colony mortality, behind starvation, queen-related issues, and parasites. The point is, honey bees die from many things. ***We must be careful to not synonymize CCD with all honey bee losses*** [4] (emphasis mine).

I'm typing these words as I fly over the beautiful jigsaw-puzzle-like frozen Manitoba landscape on my return from a speaking engagement in Sweden, where the film *More than Honey* had been recently shown. To my considerable

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surprise, the Swedish beekeepers (Fig. 1), after viewing the movie, were under the very strong impression that the bee problems in the U.S. were due to our brutal commercial beekeeping practices, and the moving of hives to the deadly almond orchards in California.

Figure 1. Beekeeper Göran Sundström at one of his apiaries in Sweden. Göran typically keeps 12 hives in an apiary, and goes to considerable trouble to comply with some rather arbitrary rules to have his honey certified as "organic." The red paint is a traditional color for rural buildings in this area.

As it happens, the director of that film had stayed with me during his initial scouting visit to the U.S., and I was responsible for introducing him to my friend John Miller, who was unfortunately (and I'm sure unknowingly) to be cast in the role of the evil bee abuser, so I felt some responsibility to dispel those misconceptions to the concerned audience. And this brings me to my next subject…

Bees are currently enjoying a great deal of attention from a fearful public eager to do *something, anything* to help them. This could be a really good thing for the bees, for beekeepers, and for the environment as a whole if such public concern and activism could be guided into meaningful actions. I can't really blame the public for being confused, since the entertaining and sensational docu-dramas about the impending extinction of the honey bee resonate more emotionally than do the dry and qualified explanations by scientists as to the "multifactorial" causes of colony mortality.

As a result of all the misinformation and hysteria out there, an unsure and distrustful public puts pressure their representatives to pass this or that new regulation to "save the bees." This scares me. I feel that we should heed the sage advice of Thomas Jefferson:

People are inherently capable of making proper judgments when they are properly informed.

And therein lies the problem: due to the complexity of what's happening with bees these days from the biological, environmental, agricultural, and economic standpoints, it's danged hard to be "properly informed." My gosh, just look at me trying to do that "informing"—I first thought that the "Sick Bee" series was only going to be two or three articles long! So what to do?

Challenging one's Beliefs

One should be careful about embracing the popular stories about why "the bees are dying." Some of the myths resonate so emotionally that they win uncritical acceptance by the mainstream, despite the fact that they cannot be reconciled with obvious facts (e.g., that bees can indeed thrive surrounded by GMO corn and soy, or on neonic-treated canola). As the popular scientific author Stephen Jay Gould pointed out:

The most erroneous stories are those we think we know best – and therefore never scrutinize or question.

Anyone who knows me (or has had the misfortune of trying to promote an unsubstantiated argument in my presence) can tell you that I'm a challenging and provocative person by nature. I've found that the best way to get to the truth is to learn how to argue your opponent's side of a debate as well as you can argue your own. Therefore, I am more than willing to play Devil's Advocate any time that I see one side of a legitimate argument being ineffectually presented. And I'm ruthlessly skeptical of any claims that do not jibe with what I see with my own eyes.

As you can imagine, this has earned me my share of vitriol from those who "know the truth" (read [5] for an enlightening discussion). Luckily, my mailbox runs about a hundred to one with thank you letters from beekeepers who appreciate my evaluation of the issues. I take this responsibility seriously; in order to remain objective and unbiased; I go out of my way to constantly question every one of my opinions (I avoid making "conclusions"). I eschew holding any "beliefs," but rather adhere to the following principles:

1. That I should respect Nature and all forms of life (my ethical environmentalist side),
2. That I should thoroughly investigate all research and explanations of any subject, and avoid cherry picking data that suits my ideological convictions (my curious open mindedness and willingness to do my homework).
3. That I should base my opinions upon information and experimental results which stand up to scrutiny and questioning (my scientific side),
4. That I should then truth-check those opinions against on-the-ground evidence and observations (my practical side).

Unfortunately, many crusaders allow their commendable environmental consciousness (and innate fear of technology) to override the last three principles, which is understandable, since doing the homework is really hard, and our understanding of the biology involved is as yet incomplete. But I have some suggestions as to where to start…

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A Homework Assignment
Allow me to first assign you some required reading. Put down this article and read Berndt Heinrich's fascinating book *Bumblebee Economics* [6]. Heinrich studied the minute details of exactly how bees make a living in their ecological niche, focusing upon the economics of energy utilization. His revelationary insights changed my understanding of bee life completely. Then for something entirely different read Ron Miksha's *Bad Beekeeping* [7] for a perspective on the economic trials and tribulations faced by professional beekeepers (his comments on p. 243 are especially relevant). I'll wait 'til you're done…

OK, I hope those books were as thought-provoking to you as they were to me! Now let's take a look at the health of bees and beekeeping from ecological and economic perspectives.

It's All about Economics
Again and again, I find that everything boils down to economics and finding the right niche. This applies to both honey bees and to the business of beekeeping - either thrives in its ideal niche, and either must either adapt or die if the parameters of the niche change. And boy howdy, how we have changed the parameters of both of our niches in recent years!

Practical application: In this real world, each species, and each business, strives to exploit a niche to which it is particularly well adapted. A change in any of the parameters that define a particular niche may affect the profitability and survival of that species or business. If that species or business is efficient and profitable in its particular niche, then it thrives; if not, if must either adapt or go extinct.

For the remainder of this article, I will view the situation of both bees and beekeepers through the lenses of ecology and economics, and the changes that have occurred in the parameters that define our niches.

Let's Define Some Terms
Pollinators are in decline over much of the world, and have been for some time [8]. We beekeepers are mainly concerned with our favorite pollinator, the European honey bee, *Apis mellifera*, native to Europe and Africa, but now introduced worldwide. Unless I specify otherwise, henceforth I will be referring to this species.

It occurs to me that if pollinators have long been in decline worldwide, then that would imply that something has changed in their ecological niches (and that it started before the introductions of cell phones, neonics, or GMO's). It also occurred to me that the niches occupied by beekeepers have changed substantially (mine sure has; indeed several times). I'll try not to burden you with too many new terms:

Habitat—where the bee species lives (or could live). The bees in the U.S. are mongrel hybrids of various European or African races [9], each originally adapted to specific microhabitats in their home countries.

Ecological niche—a description of the bees' "occupation" in its specific microhabitat, including all environmental parameters and interactions with other species.

Fundamental niche— the *potential* full range of environmental conditions and resources that the honey bee as a species could possibly occupy and use, without the limitations of predation, competition, or other factors.

Realized niche—the less-than-optimal niche that each subspecies of bee actually occupies; constrained by weather, resources, parasites, etc. In its home range, various subspecies of honey bee adapted to narrow realized niches occurring in the warm Mediterranean, the cold Alps, the British heathland, the Egyptian desert, the African savannah, etc. In each of those niches, the bees adapted to the seasonality of local nectar flows, the local plant toxins, temperature, predators, and parasite pressure. Conditions may not have been optimal, but each subspecies was economically successful at "making a living" within those parameters.

So let's list the most important parameters of the *fundamental niche* of the European honey bee:

1. It is a colonial species, existing as a superorganism with generally a single reproductive queen, supported by multiple patrilines of sterile workers, *each exhibiting slightly differing genetics, behaviors, and resistance to parasites, toxins, and diseases* (this within-hive diversity is extremely important, but often ignored by beekeepers).

2. It is a generalist species, able to gather food resources from a wide variety of plants. As such, it is adapted to metabolizing a wide range of toxic plant alleleochemicals (and by extension, synthetic pesticides).

3. It is primarily a pollinator; its diet normally consists solely of nectar and pollen, although those raw foodstuffs are processed into other products (honey, beebread, and jelly) for the actual consumption by the majority of the members of the superorganism.

4. The bee cannot forage unless the ambient temperature is above roughly 55°F (12°C). This limiting factor constrains its range to those areas that have adequate bloom available when the temperature exceeds that value; any colony with hungry brood when daytime temperatures do not exceed 55°F will soon become stressed due to an inadequate supply of protein (***this is a huge management tip***).

5. Unlike other insects, the European honey bee stores vast quantities of processed food for later consumption when resources are scarce.

6. This allows the colony to do something that no other species of temperate insect can do—maintain an elevated body temperature, and rear brood, throughout the winter.

7. In order to maintain that colonial body temperature, the European honey bee requires a protective insulated cavity within which to nest (Fig. 2).

8. Somehow, ***the European honey bee evolved with remarkably few parasites***—the only significant ones being *Nosema apis*, the bacteria causing the two foulbrood diseases, the fly *Braula*, rare infection by two opportunistic fungi in pollen (chalkbrood or stonebrood), and what were normally "economically unimportant" infections by any of several insect viruses.

Figure 2. These bees are at the top of the winter cluster at the interface between empty cells and sealed honey. Despite the air temperature being below freezing, the temperature of the bees beneath the surface was 67°F (19°C). This remarkable technique of using stored sugars from the previous summer as an energy source during winter allows the honey bee to overwinter as a populous colony, ready to exploit early spring pollen and nectar sources.

In summary, the honey bee requires a dry cavity, in which it maintains a tropical environment throughout the year, allowing it to exploit food sources any time that the temperature is above 55°F, it is adapted to metabolize a wide variety of plant toxins, it only requires a brief honeyflow to provide it with food stores for the remainder of the year, ***and it evolved under low parasite pressure***.

Practical application: this last point is of huge import when we attempt to understand the biological changes that have occurred in European honey bee populations worldwide in the last decades. To wit, virus infections have become serious "emerging diseases" [10].

Add the Beekeeper
OK, now let's add one more term:

Facilitation—Optimal conditions in the fundamental niche occur infrequently, if ever. The job of the beekeeper is to optimize the conditions for his bees as best he can, such as by supplemental feeding, medicating for parasites, protecting from predators, providing a larger nest cavity, or providing water or winter insulation. Such "facilitation" may allow bees to survive outside of their fundamental niche.

Practical application: I recently enjoyed a lunchtime conversation with a couple of professional beekeepers who moved their hives from almonds, to the tallow bloom in Texas, to the Dakotas for summer, and then to a mild area in California for wintering (their problem is having too many bees each spring). What they are doing is facilitating the optimal fundamental niche for their bees for the entire year (there are many other ways of doing so).

Practical application flip side: If a beekeeper is keeping colonies alive *outside* of their fundamental niche, such as in densely-packed apiaries, in areas of crop monoculture or high exposure to toxic chemicals, in flowerless forest or dry grassland, or by the chemical suppression of parasites, should that beekeeper falter in his constant facilitation, his bees may not be able to continue to survive without such help.

Limiting Factors
The *realized niche* of the honey bee is constrained by limiting factors, which may change from season to season. Common limiting factors for populations of honey bees are:

Climate—bees have very wide "tolerance limits" for cold, heat, rain, and length of seasons. But at the edges of their tolerance limits, colonies will be stressed, and may not be able to deal with other limiting factors.

Competition for food—in some areas there is such an abundance of nectar during the main flow that there is little competition (an important point when speaking with native pollinator advocates). The main competition for food resources occurs at other times of the year; assume that there is serious competition happening if robbing behavior is evident.

Suitability of available food—not all plants produce honey-bee-friendly nectar or pollen, especially outside of the honey bees' native range. This is clearly evident in America and Australia, where some pollen sources are notably nutritionally inadequate for honey bees (think corn, blueberry, watermelon, pumpkin, some eucalypts). And in some areas or under dearth conditions, bees will unwittingly collect naturally toxic pollen or nectar. And of course, some human-applied pesticides make the available food unsuitable.

Competition for nest sites—without hollow trees or other natural cavities, honey bees cannot survive the winter in temperate climates (Fig. 3).

Figure 3. One of my colonies swarmed late this spring and built open-air combs in a nearby hawthorn tree. We noticed it when the leaves fell in early December, following a week of subfreezing temperatures and a foot of snow. You can't see it, but there is still a cluster of live bees (which I hope to rescue when I'm done writing this article). The population had obviously grown large enough to build and completely cover all the combs, and could easily have survived the winter had it only found an appropriate cavity in which to build its nest.

Predation—Such as birds, bears, wasps, and ants. The main predator of bees, of course, are humans, who often rob too much honey from the hive, resulting in winter starvation.

Parasitism—Again, natural populations of European honey bees appear to historically have been minimally affected by parasites under normal conditions. We will return to how this has changed.

Transmission of parasites—this is very density dependent—the more colonies within flight range, and the more competition for resources, the greater the

transmission of parasites. ***The swapping of combs by beekeepers also changes this dynamic.***

Toxins—Natural plant allelochemicals, soil metals, industrial pollution, agrochemicals, and recently, *a huge influx of beekeeper-applied miticides.*

Bees have a wide range of tolerance for some limiting factors, and more narrow ranges for others. Usually, several factors interact (sometimes synergistically) to limit bee populations.

Practical application: there is often a single limiting factor that is the determinant for colony survival. A concept used in ecology is "Liebig's law of the Minimum" (Fig. 4). A beekeeper can work hard all season long to do everything he can for his bees, but should he overlook *any single critical limiting factor*, Liebig's Law may come into play, and he may lose his colonies.

Figure 4. An illustration of Liebig's Law of the Minimum as it applies to the practice of beekeeping. Despite everything else that you do to fill the barrel, the most unfavorable limiting factor(s) (or some combination thereof) at any critical period of time will limit the bees' (and your) success. Adapted from [11].

Practical application: Each race of honey bee in Europe specialized by adapting to certain combinations of limiting factors, and thus gained a fitness advantage in its particular habitat. Since the arrival of varroa, which wiped out much of the feral population, the overall genetics of the US bee population have likely shifted toward those propagated by commercial queen producers [12].

These "all-purpose" bee stocks are typically bred for color, temperament, and honey production, and maintained with a high degree of facilitation by the queen producer (feeding, treatments). There is no reason to expect those stocks to be well adapted for survival without constant facilitation. This is why I strongly support regional queen breeding for locally-adapted stock.

What Are The Limiting Factors For Honey Bees Today?

It would have been so simple had CCD actually been caused by cell phones! We could have banned the danged things, and wouldn't have to listen to people walking around loudly and obliviously talking to themselves. But alas, it appears to be more complex than that.

So as a biologist, it occurs to me to go back before CCD, in fact, to go back even further in time, and ask the question, "Which factor(s) limited honey bee populations in Europe prior to modern management by humans"? And then we can work forward in time to see what's changed since then. To be continued…

FOOTNOTES AND CITATIONS

[1] *Directed by* Jeremy Simmons (2009), *and recommended for those who didn't experience the horror of CCD personally. Unfortunately, I can't suggest anywhere to purchase a copy of this well-done and heart wrenching film.*

[2] Pollinator Research.–The Committee is aware that pollinators are responsible for the production of one-third of the Nation's food supply, but the number of managed honeybee colonies in the United States has dropped in half since 1940. Because of the importance of pollinators in the production of the Nation's food supply and their impact on the stability of our agricultural economy, the Committee encourages [the Agricultural Research Service] to continue to dedicate resources to protecting the health of both honeybees and other native bees, including continued research into colony collapse disorder. http://www.gpo.gov/fdsys/pkg/CRPT-112srpt73/html/CRPT-112srpt73.htm

[3] **Symptoms of CCD:**

HYDES CREEK
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1) In collapsed colonies
a) The complete absence of adult bees in colonies, with no or little buildup of dead bees in the colonies or in front of those colonies.
b) The presence of capped brood in colonies.
c) The presence of food stores, both honey and bee bread
i) which is not immediately robbed by other bees
ii) when attacked by hive pests such as wax moth and small hive beetle, the attack is noticeably delayed.

2) In cases where the colony appear to be actively collapsing
a) An insufficient workforce to maintain the brood that is present
b) The workforce seems to be made up of young adult bees
c) The queen is present
d) The cluster is reluctant to consume provided feed, such as sugar syrup and protein supplement

From vanEngelsdorp, D, et al (2006, revised Jan 5, 2007) Investigations into the causes of sudden and alarming colony losses experienced by beekeepers in the fall of 2006. Preliminary Report: First Revision.

[4] Williams, GR, et al (2010) Colony Collapse Disorder in context. Bioessays 32(10): 845–846. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3034041/

[5] Janabi, F (2013) From anti-GMO to pro-science: 'A Layman's Guide to GMOs'http://www.geneticliteracyproject.org/2013/12/03/from-anti-gmo-to-pro-science-a-laymans-guide-to-gmos/#.UqkDXdJ_dyI

[6] Heinrich, B (2004) Bumblebee Economics. Harvard University Press. *I highly recommend all of Heinrich's books—he's a brilliant scientist and an engaging writer whose passion it is to understand the details of how organisms survive in their niches.*

[7] Miksha, R (2004) Bad Beekeeping. Trafford. *For a more data-based analysis, see:*

Laate, EA (2013) Economics of Beekeeping in Alberta 2011. http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agdex14472/$FILE/821-62.pdf

[8] CSPNA &NRC (2007) Status of Pollinators in North America. https://download.nap.edu/login.php?record_id=11761&page=%2Fdownload.php%3Frecord_id%3D11761

[9] *The evolutionary origin of the European honey bee is currently under debate by scientists. See the following:*

Han, F, et al (2012) From where did the Western honeybee (*Apis mellifera)* originate? Ecol. Evol. 2(8): 1949–1957. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3433997/
Kotthoff, U, et al (2013), Greater past disparity and diversity hints at ancient migrations of European honey bee lineages into Africa and Asia. Journal of Biogeography 40: 1832–1838. http://onlinelibrary.wiley.com/doi/10.1111/jbi.12151/pdf

[10] Genersch, E & M Aubert (2010) Emerging and re-emerging viruses of the honey bee (*Apis mellifera* L.). Vet Res. 41(6): 54. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2883145/

[11] *Barrel illustration after Dobenecks, taken from Wikipedia* http://en.wikipedia.org/wiki/Liebig%27s_law_of_the_minimum

[12] Delaney, DA, et al (2009) Genetic characterization of commercial honey bee (Hymenoptera: Apidae) populations in the United States by using mitochondrial and microsatellite markers. Ann. Entomol. Soc. Am. 102(4): 666-673.

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

SYDNEY ROYAL NATIONAL HONEY SHOW - ENTRIES OPEN

Calling all honey producers and enthusiasts! The Sydney Royal National Honey Show is now accepting entries for the 2016 competition which will be held against the vibrant backdrop of the Sydney Royal Easter Show, 17 – 30 March 2016.

The organisers of the Show, the Royal Agricultural Society of NSW (RAS), have a long association with Australian apiculture, with competitions taking place as early as 1888.

Today, the competition is the only one of its kind in Australia and has expanded to include 60 classes to choose to enter such as honey (comb, creamed, chunk, liquid and granulated), beeswax, small producers and collections, candles, wax moulds, mead and pollen. Just like the 2015 Show, the 2016 Sydney Royal National Honey competition will include two schools classes that students can enter.

The Honeyland stand in the Woolworths Fresh Food Dome is always a Show-time favourite; here, all the exhibits will be shown, honey tasting will be offered to the public along with the rare opportunity for them to see the inner-workings of a hive at the BeeZeebo exhibition.

Judging for the Sydney Royal National Honey Show will take place 14 - 15 March, with results available on the Sydney Royal website Wednesday 16 March.

Why enter?

The Sydney Royal National Honey Show offers producers a chance to benchmark products against the industry. By entering, you will:

- Receive assurance of independent assessment of your product by an esteemed panel of industry professionals
- Have a variety of perspectives and palates assessing your product
- Attain quality feedback: a breakdown of your score by each attribute to help you improve your product
- Commercial class medallists, receive Sydney Royal medal artwork which can be used in marketing collateral

To enter the 2016 Sydney Royal National Honey Show, or for Schedule information, visit www.sydneyroyal.com.au/honey. Offline entries close 13 January. Online entries close 6 January. For further information, contact Fiona Masters on 02 9704 1199 or fmasters@rasnsw.com.au

CHANGE TO TESTS APPLIED TO IMPORTED HONEY

Imported Food Notice 17-15 advised that the tests applied to imported honey would change with effect from 14 October 2015.

The testing of imported honey for the antimicrobials, chloramphenicol, nitrofurans, streptomycin, sulphonamides and tetracyclines has demonstrated high levels of compliance for a prolonged period. The testing of imported honey for these antimicrobials will cease.

Consignments of imported honey will now be inspected, sampled and tested for evidence of the addition of cane sugar or corn syrup (C4 sugar adulteration), reducing sugar content and moisture content.

The Tests Applied To Surveillance Food webpage has been updated.

Imported Food Notices are available from the Department of Agriculture and Water Resources website: http://www.agriculture.gov.au/import/food/notices

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ANOTHER LOOK AT NEONICS, HONEY BEES, AND COLONY LOSSES IN USA

Courtesy: *Catch the Buzz*
30 November 2015

America's beekeepers are having a rough time. They lost an estimated 42 percent of their hives last year.

While some colony losses are normal, these numbers are high. "Such high colony losses in the summer and year-round remain very troubling," entomologist Jeff Pettis said in a statement. He's a researcher at the USDA's Agricultural Research Service Bee Research Laboratory in Beltsville, Md, and a co-author of the government survey that tallied up the bee losses. And these findings may be troubling for all of us who eat.

An estimated one in three mouthfuls of food we eat is dependent, to some extent, on the pollination services provided by bees and other pollinators. And honeybee pollination adds an estimated $15 billion to the value of crops each year.

What's to be done to reverse the plight of the bees?

One goal is to give bees more places to forage for nectar and pollen. Earlier this year, a presidential task force released a strategy that calls for restoring or enhancing 7 million acres of pollinator-friendly habit (think planting wildflowers along highways or other public spaces.) But such efforts alone won't be enough to counter the headwinds that bees face. The task force points to multiple stressors — from climate change to the threat of the varroa mite to exposure to pesticides. And it's that last stressor that's generated the most controversy: Several recent studies suggest that a class of pesticides called neonicotinoids, which are among the most widely used in the world, are harming bees.

The pesticides, which were introduced in the 1990s, are coated onto the seeds that farmers plant to grow their crops.

It's estimated that somewhere between 80 and 95 percent of all corn planted in the US - and about half of soybean crops — come from seeds pretreated with pesticides. And there's concern about overuse.

"The level of use is way out of step with the level of [pest] threat in most fields where we've worked," Christian Krupke, an entomologist at Purdue University, told me as part of a collaborative report with PBS NewsHour.

Krupke published a study several years back that linked bee deaths with pesticide-laden dust that flies up during the planting of the pretreated seeds. But one of the leading manufacturers of neonicotinoids, Bayer Crop Science, says it has found a way to reduce that problem: a seed lubricant that reduces the dust.

Bayer says that, outside of acute exposures, neonicotinoids are not harmful to bees. David Fischer, Bayer's chief scientist, told us that when neonics are used as part of a seed treatment, the pesticide residues that get into the plants are in a "safe range" for bees.

"The body of evidence suggests there's no link between neonic exposure, neonicotinoid use, and bee decline or bee health," Fischer says.

He argues that varroa mites, not pesticides, are responsible for many of the problems bees face. "Eighty percent of the problem is varroa mites, and the viruses and diseases" that the mites bring, Fischer says. And the industry stands behind the safety of the pesticides. "Ongoing research and field studies have consistently found no adverse effects on bee colonies when pesticides are applied according to label directions," concludes Crop Life America, an industry trade group. But, the findings of some recent studies challenge this conclusion.

For instance, a study published in the journal *Science* found bees exposed to neonicotinoid pesticides seemed less able to navigate their way back to their hives. And another study documented negative effects on populations of wild bees in seed-treated fields and in surrounding meadows.

Last month, a study published in *Nature* found that neonicotinoid pesticides affect honeybee queens. The researchers wrote that the "reproductive anatomy (ovaries) and physiology [of neonicotinoid exposed queens] were compromised."

"We found that queens exposed to the pesticides were not laying offspring to the [same] levels as those that were not [exposed to the pesticides,]" study author Geoffrey R. Williams, of the Institute of Bee Health in Switzerland, told us.

A combine harvests corn on Lucas Criswell's farm in Pennsylvania. Criswell says that cutting out neonic-treated seeds hasn't hurt his crop yields. Queen health is critical to the health of the colony, says Williams. "Our study shows it's possible that these pesticides can play a role in reducing queen health."

Bayer's Fischer says he's not convinced by Williams' findings. He says the study has "a lot of technical flaws in it, and I think it needs to be repeated."

The industry has challenged the findings of studies conducted in laboratory settings. Industry scientists argue that lab-based studies don't capture what happens in the field. But, as a spate of studies point in the direction of harm, the industry has stepped up efforts to promote the work it's undertaking to promote bee health.

Bayer and Syngenta, the top two neonic makers, have launched campaigns aimed at bolstering bee habitat and forage.

Both companies are planting millions of flowers in the U.S. to increase bee forage. And in 2014, Bayer opened a $2 million Bee Care Center in North Carolina. (Bayer earned a reported $3.6 billion in total profits last year. The company told us it wouldn't disclose its sales of neonics only, but according to figures from 2009, Bayer's global sales of a neonicotinoid called imidacloprid alone totaled $1 billion.)

The industry is having to work harder to fend off criticism — and new regulation.

Earlier this year, Ontario, Canada, introduced new rules aimed at reducing the use of these pesticides.

The aim of the new rules is "to reduce the number of acres planted with neonicotinoid-treated corn and soybean seeds by 80 percent by 2017," according to a government release.

New rules will help ensure that the pesticide-treated seed "is only used when there is evidence of a pest problem," according to the release. And, the European Union has had a partial ban of neonicotinoids in place for the past two years.

Now, the question some farmers are asking is: Do I really need these pesticides?

Lucas Criswell, who farms close to 2,000 acres in Pennsylvania's Susquehanna Valley, has stopped using neonic-treated seeds on some of his crops. Several years back, Criswell got an outbreak of slugs eating his soybean crop. He worried that the pesticides were killing off the predators of slugs.

When entomologists at Penn State studied the issue, they found evidence that this could happen. As they reported in a study published last year, neonic "levels in field-collected slugs ... were still high enough to harm insect predators," such as beetles.

"Our research suggests that neonicotinoids can have unintended costs, even within crop production," John Tooker, Associate Professor of Entomology at Penn State, said in a release about the paper.

Bayer's Fischer says he's aware of these findings, but he says the research was "conducted on a small plot on a research farm." Fischer says there's no data to show that this happens broadly. And, Fischer says there's good evidence that neonicotinoids are beneficial to farmers. "They're extremely valuable," he says.

He says neonics "increase crop yields often by 20 percent, versus the other competitors. So they contribute billions of dollars to the ag economy in the United States." He points to this industry-supported analysis that supports this conclusion. But Pennsylvania farmer Lucas Criswell is not convinced. He says his corn crop is strong — without using neonic-treated seeds. "We've been getting pretty good yields," Criswell told us — "definitely comparable" to yields from pesticide-treated seeds, he says. And, he says he's saving money, since he's paying less for the untreated seeds.

Now, instead of using the pesticide prophylactically in a pretreated seed, he uses a field scout to keep an eye out for the pests he may need to treat. "So, it's not a blanket approach," he says. If he needs to use a pesticide, "it's a spot treatment."

These pretreated seeds are used so widely, they're almost ubiquitous in corn crops. Criswell says it was a challenge to find untreated seeds. "Typically," he says, "the [pesticide] just comes with [the seed] — even if it's not needed."

He likens the prophylactic use of neonics to taking an aspirin before you have a headache. "All it does is put something in your body that you do not need." He says it's the "same as putting something into the soil that we do not need."

Criswell says he knows that other farmers may benefit from the pesticides, but he says his crops aren't beset by many of the insects that the neonics are intended to treat.

The Environmental Protection Agency is currently re-evaluating the neonicotinoid family of pesticides. The president's task force on pollinators has asked the EPA to expedite the review. And the agency has "temporarily" halted the approval of new uses of neonicotinoids.

USA - EPA ISSUES CANCELLATION ORDER FOR SULFOXAFLOR

www.apinews.com - 13 November 2015

On November 12, 2015, EPA issued a cancellation order for all previously registered Sulfoxaflor products. This cancellation order is in response to the September 10, 2015, order of the Ninth Circuit Court of Appeals finding that EPA improperly approved the Federal Insecticide, Fungicide, and Rodenticide Act registrations of the pesticide sulfoxaflor; the court's order became effective on November 12.

Pursuant to EPA's cancellation order, and beginning November 12, 2015, distribution or sale by the registrant of cancelled sulfoxaflor products is prohibited, unless such distribution or sale is for the purpose of disposal or export. Also, stocks of cancelled products held by persons other than the registrant may not be commercially distributed in the United States, but instead may be distributed only to facilitate return to the manufacturer or for proper disposal or lawful export. Use of existing stocks by end users is permitted provided such use is consistent in all respects with the previously-approved labeling for the product.

The Federal Food, Drug, and Cosmetic Act tolerances, also known as maximum pesticide residue levels for sulfoxaflor are not affected by either the court's decision or EPA's cancellation order, so crops that have been properly treated with sulfoxaflor or that may be treated with existing stocks as described in the final cancellation order can still be sold legally.

Anyone remember me commenting on the problems with transform, as I said at the recorded suposium on neonicetoids in Canberra , that when the company representative was asked for the information that supported their claim (safe to bees) we were told that the information was protected by company privacy and would not be released.

Look where we are now!

Bryn Jones

PENALTY NOTICES ISSUED TO NSW BEEKEEPERS

During the month of November, 2015, NSW Biosecurity Compliance issued penalty notices (fines) to three beekeepers for breaches of the *NSW Apiaries Act 1985.*

Two beekeepers received three notices each for the following breaches:

1. Section 6, keeping bees while unregistered
2. Section 15, failed to identify brood boxes with their registered beekeepers number
3. Section 22, failed to notify AFB

The third beekeeper was issued one notice for a breach of section 22, failed to notify AFB.

The penalty for Section 6 varies from $150 to $550 depending upon the number of hives kept.

The penalty for Section 22 is $550.

The beekeepers could have easily avoided the penalties if they complied with the legislation.

Information on legislative requirements and other beekeeping related topics can be found at the NSW Department of Primary Industries web site: http://www.dpi.nsw.gov.au/agriculture/livestock/honey-bees

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AHBIC NEWS UPDATE
Oct-Nov 2015

DEFORMED WING VIRUS AND SURVIVAL OF HONEY BEES WITH VARROA
An interesting article has recently been published. See http://www.nature.com/ismej/journal/vaop/ncurrent/full/ismej2015186a.html. The abstract says:

"*Over the past 50 years, many millions of European honey bee (Apis mellifera) colonies have died as the ectoparasitic mite, Varroa destructor, has spread around the world. Subsequent studies have indicated that the mite's association with a group of RNA viral pathogens (Deformed Wing Virus, DWV) correlates with colony death. Here, we propose a phenomenon known as superinfection exclusion that provides an explanation of how certain A. mellifera populations have survived, despite Varroa infestation and high DWV loads. Next-generation sequencing has shown that a non-lethal DWV variant 'type B' has become established in these colonies and that the lethal 'type A' DWV variant fails to persist in the bee population. We propose that this novel stable host-pathogen relationship prevents the accumulation of lethal variants, suggesting that this interaction could be exploited for the development of an effective treatment that minimises colony losses in the future.*"

This might explain why, when honey bees that are said to be "resistant" to varroa, are shifted to another area they then succumb to varroa. It is most likely the strain of DWV that is the problem.

PLANT HEALTH AUSTRALIA
Ian Zadow and Trevor Weatherhead attended the meetings of Plant Health Australia (PHA) on 24 and 25 November, 2015.

At the AGM there were three new Directors appointed. They are Dr Joanne Daly, Robert Prince and Steve McCutcheon. Malcolm Finlayson was re-appointed. All four are there for a four (4) year term.

Retiring director and PHA Chairman, Dr Tony Gregson, was thanked for his services to PHA as director for 15 years and eight (8) years as Chair.

At the first PHA Board meeting following the AGM, Mr Darral Ashton was appointed as the Chairman for the next two years, and Dr Bruce Kefford was appointed as Deputy Chairman. Other outgoing directors were Selwyn Snell and Eoin Wallis.

CHANGES TO THE NATIONAL BEE PEST SURVEILLANCE PROGRAM
AHBIC has received word from PHA that the APVMA have approved changes to the time that the acaracide strips are left in the hives as part of the National Bee Pest Surveillance Program.

The strips can now be left in for 1-6 days around 6-8 weeks apart but no more than 9 times a year. This should make it more effective and is in line with discussions held at the 2014 AHBIC AGM.

HONEY LEVY
With the new honey levy coming into place on 1 July, 2015, it is time for some to re-evaluate whether they now should be paying the levy. The threshold was lifted from 600 kgs to 1,500 kgs. If you had previously been submitting levy returns but now you do not qualify, please contact the Levies Unit to have your name taken off the list. This way we are not charged for collection costs. On the other hand, if you do sell more than 1,500 kgs a year to other than listed honey dealers, then it is a requirement that you submit a return.

Pleases remember that this is a statutory levy that is divided between the biosecurity levy, PHA levy, research and the NRS monitoring. None of this levy goes to AHBIC to help run AHBIC. AHBIC is funded by voluntary levies and I would encourage you to become a voluntary contributor if you are not already one. To those who do make voluntary contributions a big thank you.

BAITS FOR EUROPEAN WASPS
New Zealand researchers have developed a bait for European wasps that does not attract bees. See http://www.abc.net.au/news/2015-11-17/european-wasp-bait-effective-keeps-bees-safe/6946482

They are looking to make these available in Australia.

CATEGORISATION
At this stage the categorisation of the two Varroas and the two Tropilaelaps is still under consideration.

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BEE PEST SURVEILLANCE SYSTEM UNDER REVIEW

Tuesday 13 October 2015

A comprehensive review is underway into the system protecting Australia's honey and pollination industries, to ensure it continues to employ the latest technology and place its resources in the most strategic way.

The National Bee Pest Surveillance Program (NBPSP) is a world-leading initiative designed to ensure early detection of a range of exotic pests and diseases, such as *Varroa* mite, that could devastate both managed and feral hives.

NBPSP facilitator Sam Malfroy, from Plant Health Australia, says regular, effective surveillance is vital.

"We need to have as many eyes, as often as possible, in the right places to provide reassurance that no new threats have arrived in the country, and to let us respond as quickly as possible if one is found," Mr Malfroy said.

"For eradication to work, we need to identify a new pest or disease close to where it has entered the country, before it has had a chance to spread into a large number of bee colonies.

"This review will look at different scenarios around an incursion, and investigate for each of them how long it would take us to detect a pest via various surveillance methods, how far it is likely to get from a port, and our chances of containing an outbreak.

"The final report will provide a cost: benefit analysis that outlines ideal methods, locations and frequency of surveillance, as well as the costs of not detecting something like *Varroa* early enough, so we can continue to adjust our procedures."

The NBPSP is a partnership between industry and government, with funding from the honey bee industry, pollination-reliant plant industries and the Federal Government, with in-kind support from State and Territory governments.

The Federal Department of Agriculture called for a review of its effectiveness ahead of a new funding agreement, after the 2014 Senate inquiry into the *Future of the beekeeping and pollination service industries in Australia* recommended the government 'confirm, and consider enlarging, its commitment' to the NBPSP.

For details on the National Bee Pest Surveillance Program, visit nbpsp.planthealthaustralia.com.au.

Media contact: Kaaren Latham 02 8204 3852

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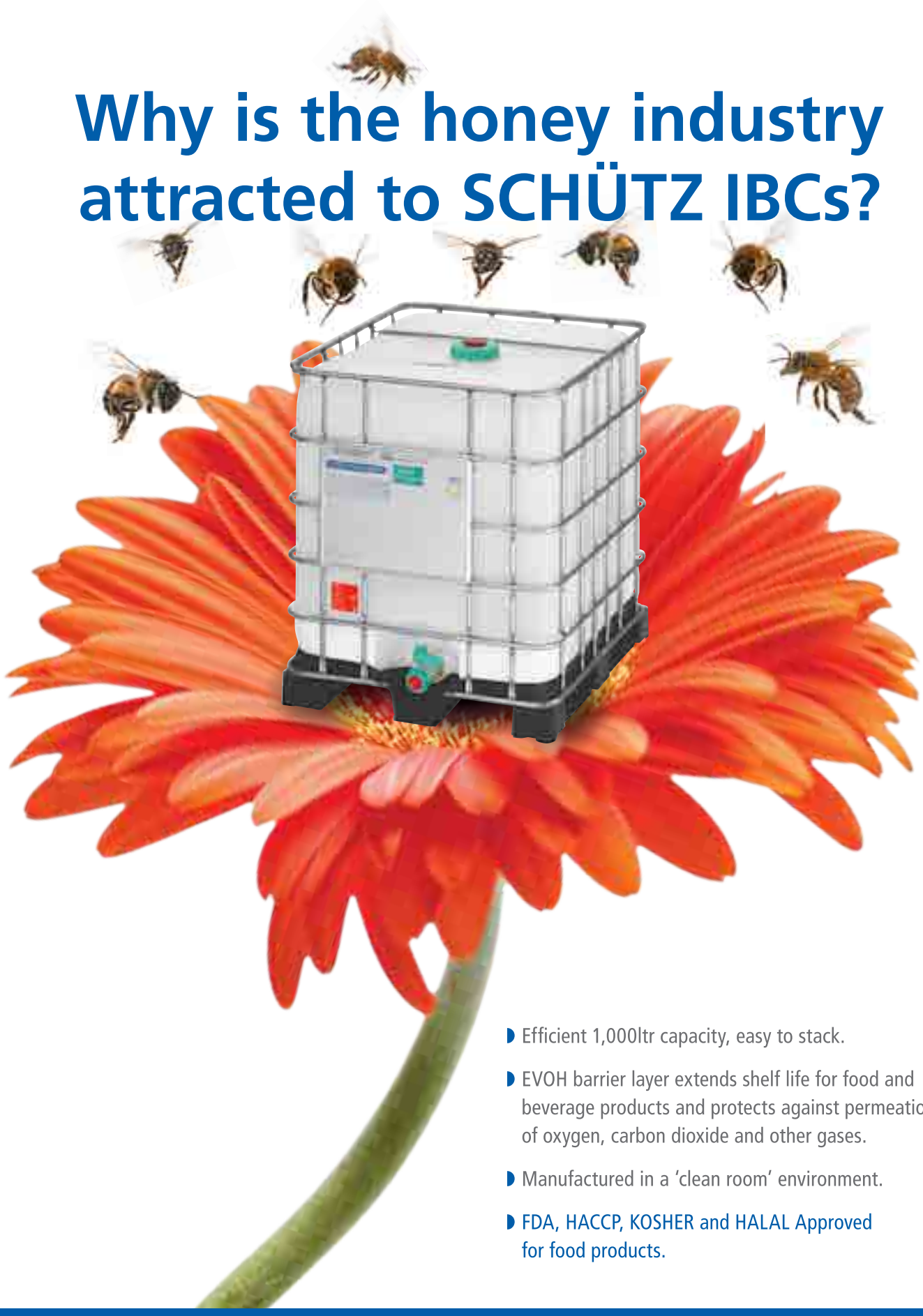

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