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PO Box 715, Wellington 6015, New Zealand.

NATIONAL EXECUTIVE BEEKEEPERS' ASSOCIATION OF NZ (Inc.)

www.nba.org.nz

President: Terry Gavin, PDC, Titoki,
Private Bag, Whangarei.
Tel: (09) 433-1893
Fax: (09) 433-1895

Jane Lorimer
RD3, Hamilton
Tel: (07) 856-9625
Fax: (07) 856-9241

Executive: Tony Taiaroa
43 Princess Street, Waikari 8276.
Tel/Fax: (03) 314-4569

Don Bell
Annat Apiaries,
Frasers Road, Sheffield,
RD, Canterbury 8173.
Tel: (03) 318-3869
Fax: (03) 318-3862

Lin McKenzie
Box 34, Ranfurly
Central Otago.
Tel/Fax: (03) 444-9257
Email:lin.mckenzie@xtra.co.nz

Tim Leslie, NBA Secretary,
PO Box 715,
Wellington 6015, New Zealand.
Phone: (04) 473-7269, Fax: (04) 473-1081
Email: tleslie@fedfarm.org.nz

Hon. Librarian: John Heineman
C/- NZ Post Shop,
Milton, Otago.
Tel: (03) 417-7197

New Zealand Honey Food & Ingredient Advisory Service
OF THE NATIONAL BEEKEEPERS' ASSOCIATION OF N.Z. (INC.)
312 Scott Street, PO Box 32, Blenheim, New Zealand.
Tel: (03) 577-6103, Fax: (03) 577-8429, Email: bill.floyd@clear.net.nz

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BRANCHES

The first named person is the President/Chairperson. The second is the Secretary.

FAR NORTH
Bob Banks
Taupo Bay, Northland.
Tel: (09) 406-0692
Graham Wilson
Waimate Road, RD 3, Kerikeri.
Tel: (09) 407-9068

NORTHLAND
Don Hoole,
Sheddock Apiaries, RD 1, Paparoa
Tel/Fax: (09) 431-7348
Simon Peacey
Wairua Apiaries, 76 Malone Rd,
Kokopu, RD9, Whangarei
Tel/Fax: (09) 434-6344
Email: peacey@ihug.co.nz

AUCKLAND
Brian Alexander
Woodhaugh Apiaries, RD 3,
Kaukapakapa.
Tel/Fax: (09) 420-5028
Jim Thompson
125 Queen Street, Pukekohe.
Tel: (09) 238-7464
Fax: (09) 232-8429

WAIKATO
Lewis Olsen
Ohaupo Apiaries
Great South Road, RD 3, Ohaupo.
Tel: (07) 823-6706
Tony Lorimer
'Kahurangi-o-Papa', RD 3, Hamilton.
Tel: (07) 856-9625, Fax: (07) 856-9241

BAY OF PLENTY
Gerrit Hyink
271 Lindemann Road,
Katikati.
Tel/Fax: (07) 549-1223
Email: hyink@xtra.co.nz
Ross Carroll
78 Laurel Drive,
RD 6
Tauranga.
Tel: (07) 552-4585

HAWKE'S BAY
Tom Taylor
Box 48, Onga Onga,
Central Hawke's Bay.
Tel: (06) 856-6610
Fax: (06) 856-6611
Ron Morison
6 Totara Street, Taradale.
Tel/Fax: (06) 844-9493
Email:rmorison@clear.net.nz

POVERTY BAY
Peter Burt
27 Murphy Road, Wainui, Gisborne.
Tel: (06) 868-4771
Email:pwburt@clear.net.nz
Barry Foster
695 Aberdeen Road, Gisborne.
Tel/Fax: (06) 867-4591
Email:bjfoster@xtra.co.nz

SOUTHERN NORTH ISLAND
Robin McCammon
Utuwai
RD, Ashurst.
Tel: (06) 329-4861
Frank Lindsay
26 Cunliffe Street, Johnsonville,
Wellington 6004.
Tel/Fax: (04) 478-3367
Email:lindsays.apiaries@xtra.co.nz

SOUTH ISLAND

NELSON
Glenn Kelly
Mickells Road, Brooklyn, RD 3,
Motueka.
Tel/Fax: (03) 528-8149
Michael Wraight
15 Titoki Place, Motueka.
Tel: (03) 528-6010

MARLBOROUGH
Gerald Steer
45 Kinross Street, Blenheim
Tel: (03) 578-2889
Jeff Hook
Rd 4, Blenheim.
Tel: (03) 577-5489

WEST COAST
John Glasson
34 Shakespeare Street
Greymouth, Westland.
Tel/Fax: (03) 768-4793
Gary Glasson
Glasson's Lane
Blackball, Westland
Tel/Fax: (03) 732-4856

CANTERBURY
Richard Bensemann
13 Spring Place,
Leeston.
Tel/Fax: (03) 324-4410
Trevor Corbett
80 Glenmark Drive, Waipara,
North Canterbury.
Tel/Fax: (03) 314-6836

SOUTH CANTERBURY
Peter Lyttle
NZ Beeswax Ltd RD 22, Geraldine 8751.
Tel: (03) 693-9189 Fax: (03) 693-9780
Email:beeswax@xtra.co.nz
Peter Smyth
Templer Street, RD 22, Geraldine.
Tel: (03) 693-9889

OTAGO
Blair Dale
PO Box 23, Middlemarch, Otago.
Work Tel/Fax: (03) 464-3796
Home Tel/Fax: (03) 464-3122
Email:blair.dale@clear.net.nz
Mike Vercoe
Box 241, Alexandra.
Tel/Fax: (03) 448-7811
Email:dmvercoe@xtra.co.nz

NORTH OTAGO
Bruce Steffens
RD 2 C, Oamaru.
Tel: (03) 432-4030
Bryan O'Neil
RD 4 K, Oamaru.
Tel: (03) 431-1831

SOUTHLAND
Carne Clissold
113 Waikaka Road, RD 5, Gore.
Tel: (03) 207-1866 Fax: (03) 207-1011
Email:clissold@esi.co.nz
Don Stedman, Catlins Apiaries,
Pine Bush, RD1, Wyndham.
Tel/Fax: (03) 246-9777

The New Zealand BeeKeeper is published eleven times per annum; February to December. All copy should be with the Editor by the 1st day of the month of publication except for December when copy should be received by **25th November.**

President's notes

by Terry Gavin

At the time of writing these notes, further pockets of varroa are being discovered occasionally as a result of tracing by a team of AgriQuality staff. Eradication versus containment seems to be the general beekeeping topic and, to get some indication of beekeepers opinion, MAF will send a draft copy of the Operation Plan For The Eradication Of Varroa to approximately 700 registered beekeepers and they will be canvassed, by MAF, for their decision, subject to their proposed changes to the draft document. I suggest you keep your MP fully informed of your feelings.

As indicated by the Honorary Jim Sutton, Minister of Agriculture, it is too soon to say whether an attempt to eradicate varroa mite is feasible. While the Industry Technical Experts Group has doubts, the Minister indicated that this group was only part of a series of things that needed to be completed before Government can make a decision either way on eradication. Executive is assembling a committee to organise the restocking of hives should eradication be attempted.

The Minister specially mentioned, in the press release, the beekeepers who worked steadily for so long to complete the survey. These industry members have stood out and have earned the respect and admiration of many both inside and outside this industry. I am grateful for the dedication of these people who have lifted the stature of this industry immensely.

A lengthy discussion at the Agricultural Security Consultative Committee meeting on June 1st on how the varroa incursion occurred and what needed to be done to strengthen the second line of defence, the Surveillance for Exotic Disease program.

The Executive elections are with us again and I thank all those who allowed their names to go forward as candidates. Without these people, we would not have an association. There are two nominations for each of the positions in the North Island so a poll will be held. There are two nominations for two positions in the South Island so no poll will be needed there. Members in both islands have the right to vote for the North Island election.

NBA will be exhibiting at the National Agricultural Field Days at Mystery Creek. The Waikato Branch will be hosts with the objective being to promote the importance of the beekeeping industry to the New Zealand economy, how and why agricultural land users can benefit from working with the beekeeper, the varietal honeys of New Zealand, and results of research programmes within the Honey Research Unit at the University of Waikato.

The Poverty Bay branch have an interesting programme for this year's conference with the seminar dealing with a variety of subjects, including varroa. We will be honoured to have an international speaker, Dr Eva Crane. This conference will be most important, in view of the varroa incursion into New Zealand, and by then we will have Cabinet's decision on how we will deal with varroa. Executive would appreciate a good attendance at conference as major decisions will have to be made.

Letters to the editor

Dear Sir

It has been quite a few years since I have been active in the beekeeping industry affairs, for various personal reasons.

I was pleased to recently receive an edition of *The New Zealand BeeKeeper* magazine. It is an excellent source of recent information about the beekeeping industry and about keeping bees using modern methods. The Editor and the Executive should be congratulated for keeping everything so up to date and timely.

Best wishes to all of my beekeeping friends.

Isaac Hopkins,
Hopkins Honey

Dear Sir

There is a popular programme on the television where the presenters demonstrate some of the pitfalls that the public can encounter when entering into an agreement and parting with their money. Their emphasis is always to read the contract and any small print.

If there is no contract and no small print what then??

I feel that through The National Beekeeper magazine the organisation that won the contract to administer the AFB Competency Test should have made some of their unilateral decisions known before embarking on the project, thereby saving them having to answer some 'frequently asked questions' (*BeeKeeper* April 2000).

It would also have made for a clearer direction for candidates to understand their obligations when undertaking the test. Candidates would have realised that the money paid for the test was not refundable, even if they had given a valid reason for not being present.

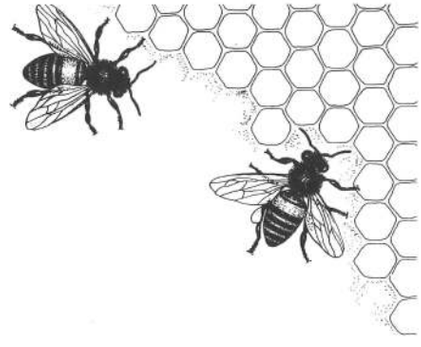
I quite understand that the administrative work has to be paid for somewhere, but allowances for some refund or reissue of the personalised test paper should be built into the system somewhere.

Also, the word Proctor is an inappropriate title in my book (look it up in your dictionary). Test Supervisor would be a more descriptive title and people would understand the job requirement better.

Dorothy Lamsdale,
Dunedin

The New Zealand
BeeKeeper

THIS ISSUE



Cover photo: Courtesy of Klaus Nowottnick, Germany.

Likely impact of Varroa Mite infestation on crop pollination by honey-bees

There would be very few growers of horticultural/agriculture crops who have not heard the news that New Zealand's borders have been breached by the serious honey bee pest, *Varroa Jacobsoni*. The issues raised by this pest confirmation in New Zealand are complex and have outcomes which affect beekeepers, growers, exporters of New Zealand produce and the consumer of New Zealand produce local and offshore.

The number one issue should the mite be declared endemic is the beekeeping industries loss of drug free products, honey, pollen, propolis, bees, queens, bees wax and pollination.

If the mite is established in New Zealand then to survive ALL beehives will be treated in the spring and autumn with a fumigant (eg Fluvalinate or Coumophos) to reduce mite populations to low numbers which would allow bee colonies to raise sufficient healthy bees to gather pollen, honey for harvest and crop pollination.

There are alternatives to the use of chemicals but those are complex, very time consuming and expensive, but are of concern to beekeepers providing product to the organic industry and must be addressed now so that appropriate actions can be undertaken.

At the time of writing the mite has not been found outside the original central area of Rodney District and Hauraki Plains, although it has been confirmed in the feral bee population.

Background

Varroa Jacobsoni originated in Eastern Asia, a small bronze coloured oval animal 1-2mm long, its natural host is *Apis Cerana*. It spread into Europe via Russia after finding *Apis Mellifera* (the honey-bee) a preferred host. Since the 1980s it has been carried into most other beekeeping regions of the world destroying thousands of colonies. Until now New Zealand and Australia have been considered the only major beekeeping countries free of the mite.

The mite lives by feeding on the haemolymph of honey-bee pupae. Emerging adult bees have reduced life spans, may be deformed and many pupae fail to survive. Eventually the mite population increase to the point where all the bees of the colony die. This can take up to three years from initial infestation. The mite spreads naturally from hive to hive by bee contact (hitch hiking). However the rapid spread of the mite internationally is due to human activity. Modern beekeepers move bees long distances to pollinate crops and gather honey. There is an international trade in live bees and queens, hence the movement of the mite worldwide and its spread over the whole of North America within five years of introduction.

Impact of Varroa

Most advanced beekeeping countries have developed techniques to control the mite population which do allow commercial beekeeping to survive and indeed for some beekeepers to flourish. As a generalisation, all feral colonies will die out, most hobbyist beekeepers will lose their colonies, some 25% of part time and commercial beekeepers will discontinue/fold their enterprises, some will fail for financial reasons, others will continue to make ends meet while the top 10-15% will flourish. If the mite is declared endemic the above will occur within five years. (My prediction from the international experience) for growers regardless of what occurs I expect there to be few changes. For the next two years should the mite be declared endemic or an eradication program be undertaken there's plenty of hives available for the pollination of crops.

In the short term, regardless of the scenario chosen, there will be an increase in hive rental fees as beekeepers will be using chemicals to either monitor hives for mite infestation or to keep mite population at a level that colonies will remain productive.

If it becomes established a significant number of colonies will be killed within three years, possibly causing a temporary shortage of colonies available for the pollination of crops. Control would initially be by the use of expensive chemicals and may create problems for organic growers and there will be some consumer resistance to honey products.

By Trevor Bryant, Apiculturist Orchardist, Te Puke

From the colonies

Willows for bees, The following species of willow have been selected to provide a continuous sequence of flowering from mid July until early April (at Palmerston North). Flowering times depend on weather conditions, latitude and altitude, and may be some weeks earlier or later in other districts. However the sequence of flowering times generally remains the same.

Clone no	Species	Sex	Average Flowering Period
229	Salix Medemii	M	15 July-17 August
219	Salix Discolor	M	14 August-9 September
227	Salix Matsudana	F	2 September-21 September
1130	Salix Matsudana X Alba Hiwinui	M	29 August-27 September
220	Salix Viminalis 'Gigantea'	M	4 September 1 October
249	Salix Purpurea 'Booth'	F	7 September-5 October
1040	Salix Matsudana X Alba 'Tangoio'	F	18 September-8 October
717	Salix Triandra 'Semperflorens'	M	1 October-7 April

Salix Medemii, Large, spreading, multi stemmed shrub willow, up to 10m tall, large ovate leaves, and catkins which appear before the leaves. Useful for farm shelter belts in combination with other species.

Salix Discolour, Erect shrub or tree to 10m maximum height, narrow, multistemmed habit, very suitable for shelterbelt planting. It is widely used for this purpose in the Hawke's Bay district. Only male trees are known in New Zealand. This variety will tolerate drier soil conditions than most willows. It is also the most tolerant of salt laden winds, although it cannot be planted very near the coast in windy areas.

Salix Matsudana, Typically a single stemmed tree, which often develops a spreading crown with several upright leaders and slightly pendulous lower branches. Height up to 20m at age 15 years. The commonly planted clone in New Zealand is female. Although moist sites are preferred, it can withstand drier sites once established.

Salix Matsudana X Alba 'Hiwinui', A profusely flowering male hybrid, this clone is faster growing than the female parent and develops into a large spreading tree up to 25m tall. Its site requirements are similar to Matsudana.

Salix Viminalis 'Gigantea', A vigorous growing male osier willow, with a multi stemmed habit and maximum height of 7-8m. Not suitable for shelter planting, except in wide belts. Various seedling forms are commonly found growing on river beds in the southern North island and Canterbury and these have sometimes been used for basket making.

Salix Purpurea 'Booth', Osier willow with narrow leaves, slightly purplish in colour, maximum height of about 7m. Is widely planted for streambank protection and soil conservation because of its bitter tasting foliage which is resistant to browsing by possums. Sex is female and catkins appear before the leaves.

Salix Matsudana X Alba 'Tangoio', Hybrid willow clone, similar to Hirinui but as female does not produce pollen. Form more upright with maximum height of 20m.

Salix Triandra 'Semperflorens': is remarkable in that it flowers continuously from October till April. Multi stemmed osier type willow. Growth rate is rapid for the first few years, but maximum height is about 7-8m. Not suitable for tall shelter, but can include in multirowed shelterbelts, or planted alone as medium height shelter.

June/July in the hives

A time to plant willows for both pollen and nectar sources for your bees. You will note that total production of all trees carries through from July till April, however large plantings are required to make an impression on hive production. You will need to see the nursery people or ring Stuart Ward to access the supplying nursery as he purchased some quite some time ago.

Working bees within a varroa infected area while the present controls are on can be difficult. A controlled area has been declared and includes Rodney - North Shore - Waitakere - Auckland City - Manukau City - Papakura - Franklin - Waikato - Hamilton and Hauraki District.

The controlled area will mean that the movement of **ANY** bees (live or dead), beehives, supers of honey intended for extraction, used beekeeping equipment and appliances will be prohibited within the area, or from the area to other areas. This will remain in force until the survey has determined the mites distribution. There will be further controls on movements of these items from be further controls on movements for these items from the North to South Islands.

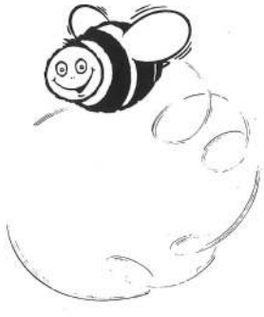
One can apply for a permit for feeding, taking honey or generally working bees by ringing 0800 109 383 but to give some idea of the serious nature of offending, a description of the vehicle you use is required, so that if interviewed by the Police, they can identify you via the permit issued. ***The penalties for offending are extremely high.***

Stores: Each hive will require roughly six frames of stores to see them through till the next flows in November and for every frame short of this amount you will need to feed 3kgs of sugar. To obtain the necessary thick syrup, you need to use boiling water. A thin syrup should not be used at this time of the year as it tends to fool the Queen that a flow is on and she goes into a laying frenzy, which is why we use this mix to build up the hive numbers.

Hives should be down to two boxes now, but if you can get them down to one box the bees will be warmer and warm bees consume far less honey.

Queenless Hives: Queens can get lost in winter and not replaceable and one often hears that the answer to this is to unite with another hive. I however, prefer to keep both hives going by taking a frame of brood from a queenrite hive and place in the queenless one every two or three weeks. In spring when drones are once again with us, take two frames of brood together with nurse bees and place in the queenless together with a new queen if they are then available, but if not the new brood together with the nurse bees will raise what is often called a 'Pauper" queen. Presumably a pauper is a poor queen which will be replaced later. From late April to early September, drones are not available and therefore the mating of virgin queens does not occur and those mated a month each side of this period are not always the best mated owing to inclement weather.

Storage of Frames: Wax moth which continue to live in winter stored frames can ruin the comb by building web from frame to frame. To stop this I always place a page of newspaper between each stored super. It has been said that the ink is a deterrent. PDB crystals can be used every fifth box. Put a handful of crystals on a small card on top and cover.



July Meeting

To be a woodwork session.

Date:	9 July 2000
Time:	10am cuppa and problems. 10.30 hammering starts.
Hosts:	Liz and Neville Brook and their little six year old.
Venue:	187E Clarks Beach Road, Clarks Beach. Phone: 232-1111.
Directions:	3kms past the Waiau Pa store on the right hand side is No 187, down the right of way of which the Brook home is second on the left.
Programme:	Involves the making of all woodwork required around the apiary site with a chance to try your hand at frame assembly. Liz would probably like us to look into her hives. Some fun for the Kiddies.

Report from the Franklin Beekeepers Club Newsletter, June/July 2000

Business Continuance:
Holistic approach to risk management

To bee or not to bee!

In this article I challenge you to examine the basis of your own organisation's viability and how well safe guarded it is, not only from your obvious and well-known threats, but also your statistically less probable threats that can kill your 'business'.

New Zealand has once again been reminded of the fragility of the 'business' from diverse threats that can impact on the viability of any organisation and industry sector. In April 2000 we learned of the incursion of the varroa mite that now poses a major threat to New Zealand's multi-billion dollar agriculture industries.

The wealth of scientific and economic detail about this pest highlights the enormous significance to the New Zealand economy of remaining free of it. Border management (controls) has been undertaken for forty years.

But to rub salt into the wound, we learn of the possibility that this pest is likely to have been present for several years, albeit initially at undetectable levels.

This article sets out the examine the principles of soundly based *business continuance* planning (holistic *business continuity* planning) and closely associated *risk management*, using the varroa mite crisis to demonstrate pertinent issues applicable to all organisations in all sectors, (private and government). It is intended to highlight *what* ought to be done for sound business continuance, and does not attempt to identify *who* is or should be responsible in the specific examples used.

Varroa mite (basic facts)

This mite, *Varroa jacobsonii* is a global pest, well researched and understood in scientific circles. It exists on bee larvae and adults creating adverse physical and behavioural effects that break down bee colonies. Its epidemic spread is only between live bees. Eradication requires pesticides, a difficult challenge among feral colonies. While no country has yet completely eradicated this pest, it may be possible in New Zealand at enormous cost.

The varroa mites' impact on honey and other apiary products (collectively worth over New Zealand $50 million per annum) is to threaten their 'clean, green' product differentiation (with associated high prices) throughout New Zealand's global markets. Further, New Zealand bee populations could decline significantly with a corresponding drop in production volumes.

But much, much worse is the threat of a significant decline in natural pollination. This would impair harvests (quantity and quality) and reduce nitrogen fixing of soils, at enormous cost to all of the nation's many agricultural industries.

Data collection and strategy development since initial detection will total over $2 million. The social acceptability of attempted eradication, estimated at $55 million, is still being assessed (as at June 2000).

Risk management and business continuance

Do you know that 'risk management' is the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risk? Compare this with 'corporate governance' - the set of strategic functions and processes that protect stakeholders' interests, and the system by which organisations are led and controlled to achieve this.

A soundly based 'business continuance programme' provides a convenient, cost effective means of integrating risk management and corporate governance. Safeguards are achieved by adopting a broad focus on business-as-usual as well as crisis/disaster risks and issues. This type of approach is now demanded of Boards of Directors and management of UK companies (refer *The Turnbull Report - Corporate governance bombshell* - refer Risk Management, issue 22).

In the following, several major components of sound business continuance are explored, and demonstrated using the varroa mite pest crisis.

Comprehensive planning

Does your business continuity or other emergency/disaster planning provide you with sound business continuance? The latter encompasses all four phases of risk management, namely:

1. Mitigation (lessening a risk and/or reducing the impact of it).
2. Preparedness (preparations to ensure an adequate response).
3. Response (limiting the impacts once commenced), and
4. Recovery (progressing towards an acceptable level of normality).

It may prove necessary for the apiary industry, MAF and AgriQuality to reassess the comprehensiveness and synchronisation of their existing plans, and their overall alignment to an appropriate BC goal.

BC strategy

How can you justify the safeguards you take? Sound business continuance planning and resulting practices require a focused goal and objectives. This goal should be closely aligned to overall strategy and annual planning for the purpose of 'continuing' through and beyond inevitable threats to the 'business'.

This holistic approach ensures the organisation recognises where it wants to be beyond a crisis, often with the notion of betterment and/or capitalising upon opportunities. Compare this approach with the regrettably typical, fragmented approach often confined to individual departments/units without serious regard to surrounding stakeholders.

For example, could it be assumed that the 'exotic bee disease surveillance programme' undertaken by the Ministry of Agriculture and Forestry (MAF), has a goal oriented to the national interest rather than either industry pests/diseases?

Risks

A fully responsible organisation will periodically address the broadest range of identifiable risks to its viability, no matter:

- how improbable the threat arising from each might be
- how infrequent historically, and
- how unaffordable or impractical the solutions to each might appear.

Consider the following examples of diverse risks such as those arising from or related to markets, credit, liquidity, technology, legal (including compliance), information, health, safety, environments (man-made and natural events and trends), supply and distribution chains, image and reputation, business probity, and so on.

The varroa mite pest has been excluded from New Zealand through forty years of successful (until now) border management. However, the technological and economic evolution in transportation, coupled with political and other environments, may have inadvertently outstripped the adequacy of current protection arrangements.

Given the potential impacts of this pest within this changing environment, more frequent reviews by both MAF and the industry itself of their overall risk management might have provided better safeguards. Has it now been revealed that

current detection testing by individual apiaries, particularly those acting as significant hubs for the shipment of live bees, is inadequate to achieve prompt detection and prompt containment of unlikely but devastating pests/diseases?

External stakeholders

Do you embrace your business-critical external stakeholders within your organisation's mitigation, preparedness, response and recovery activities? Roles, functions and the business-criticality of each dependency become well understood as a natural component of a sound business continuance programme.

Figure 1 provides a generic example of an organisation and its stakeholders. 'Production stakeholders' are those directly involved in the organisation's production/service operations, while 'peripheral stakeholders' are those providing indirect/intermittent support. Each stakeholder and associated link represents a dependency and source of risk of possible failure to meet expectations.

Consider an individual apiary or the apiary industry as a whole, at the centre of the diagram. MAF and its agent, AgriQuality New Zealand, are perhaps business-critical for pest management - as peripheral stakeholders for developing standards and as production stakeholders for implementing these standards.

This diagram can be redrawn in many ways. For example, its centre might comprise the agriculture industry as a whole or alternatively any of the individual component industries or any single company.

Accountabilities

Where should accountabilities lie for safeguarding your organisation's viability? The Turnbull 'guideline' clearly indicates that directors, senior management and all employees have important roles to this end. These can be effectively identified and communicated using a suitable constructed business continuance plan.

But where do responsibilities lie between stakeholders? In our example, the National Beekeepers' Association (NBA) contracts AgriQuality to control AFB, an endemic disease that is present in New Zealand. This service is paid for by an NBA levy on each hive and is backed up with mandatory and voluntary detection practices performed by members.

In contrast, MAF's 'exotic bee disease surveillance programme' is funded by government to provide safeguards against the arrival of varroa and other disastrous pests/diseases not supposedly established in New Zealand. Apiarists participate in gathering samples.

Unfortunately, external environments such as government sector reforms can easily erode safeguards. How proactive should agricultural industry agencies and individual companies respectively, become in reviewing the adequacy of all safeguards to their own business viability?

For example, to what extant should apiarists be responsible for early self-detection in their own interests, to avoid the next pest/disease crisis?

Quality

A correlation can be clearly seen between sound business continuance practices and associated quality assurance. Adequate mitigation, preparedness, response and recovery practices rely on 'meeting expectations' that must be communicated (therefore documented) and regularly reviewed. These should overlap with, and/or stimulate the establishment of, business-as-usual standards and other quality initiatives.

The design and resourcing of MAF's exotic bee disease surveillance programme might usefully include standards for detection times. These might be derived from various factors including the direct cost of mitigation, the probability of effective eradication after detection, the indirect costs arising from failed eradication, etc.

The possibility that the varroa mite has remained undetected for several years, coupled with its disastrous impacts (environmental and economic) and extreme difficulty of eradication, may reveal deficiencies in establishing and/or adhering the quality mitigation standards.

Conclusion

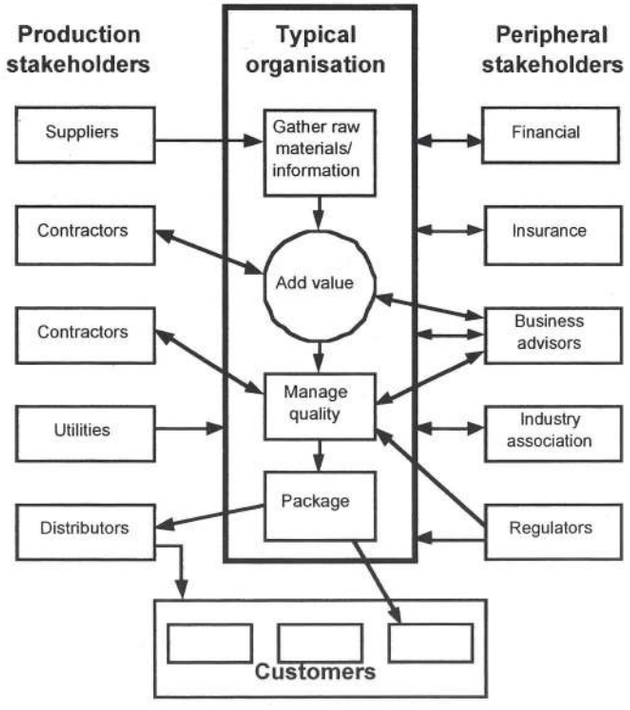
It is of the utmost importance to safeguard the viability of any organisation and interest group that has a worthwhile purpose to fulfil the function to perform. This can be readily achieved through adoption of soundly based *business continuance* principles that by definition encompass a holistic approach to *risk management* and its integration with *corporate governance.*

While examples and parallels have been made with New Zealand's agriculture sector, important lessons can be drawn for all organisations (large and small, private and government, profit and non-profit).

'Business continuance planning' is a cost effective practice to be ignored at your peril.

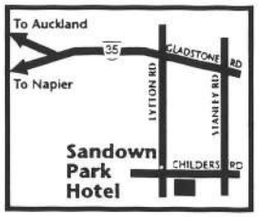
David Dunsheath, Director, Business Continuance Planning Limited, Wellington
Email: davidd@bcp.co.nz, Phone (04) 471-2407,
Website: http://www.hop.co.nz

Figure 1



Poverty Bay Branch

National Beekeepers' Assocation Inc. Annual Conference Gisborne 2000 17th-20th July at the Sandown Motor Park Hotel



SANDOWN MOTOR PARK
Childers Road, PO Box 831, Gisborne
Phone: (06) 867-9299
Fax: (06) 867-0080

The National Beekeepers' Annual Conference is coming up and the Gisborne committee are pleased to be able to welcome delegates and partners to the First City to see the New Millennium and share in the four days of conference in East Coast style. Although some 500kms form either Wellington or Auckland, Gisborne has seen itself very proactive in the beekeeping industry with the strength of the environment offering ideal conditions for the honey industry. We look forward to having you join us in Gisborne on the 17th July and are positive you will find the conference programme extremely informative and entertaining.

Programme

Mon 17	Registration Trade Displays Speciality Groups Mix & Mingle & Meal
Tues 18	Seminar Day Keynote Speaker
Wed 19	AGM & Conference of delegates Dinner & Entertainment *Partner Programme
Thurs 20	Conference of Delegates Election President & Exec

Seminar

SPEAKERS WILL INCLUDE:

- **Dr Eva Crane**
- **Dr Andrew Matheson**
- **Cliff Van Eaton**
- **Canadian and UK Varroa specialists**

Partner Programme

Eastwoodhill Visit and Ngatapa Valley Experience

9.00am	Collect Bus or shuttles Drive to Ngatapa Visit Craft Sites EWH Lunch provided Tour Arboretum Depart
4.00pm	Arrive Gisborne

Registration Form

Registration: Please help by registering early using the accompanying form.
Please return this registration form to: Barry Foster, Conference Secretary, 695 Aberdeen Road, Gisborne. Telephone/Fax: (06) 867-4591, Email: bjfoster@xtra.co.nz

Name: .....

Address: .....

.....

.....

Phone: ( ) .....

Fax: ( ) .....

Registration Fees

Registration Fee	**$30**
Seminar & Lunch	**$40**
Mix & Mingle & meal	**$20**
Dinner	**$45**
TOTAL	**$135**
Partner Programme	**$40**
Late fee payment (after 14 July)	**$15**

Cheque attached - receipt please ☐

Tracking bees with radar

The flight patterns of bees have been studied for over 100 years, but due to their small size, bees can only be tracked by eye for a very short distance from the nest or hive. Scientists have employed various techniques, including mark-recapture, feeder experiments, homing experiments and the interpretation of bee dances, to investigate bee foraging ranges. There is, however, still little detailed information about flight patterns between nest and forage sites, or about the behaviour involved in learning the features of the landscape. The adaptation of radar techniques for use in entomological research, has allowed insect flight paths to be accurately and continuously tracked over much greater distances. This article summarises the progress made in applying radar to bee studies, and suggests some possibilities for the future.

Pioneer studies

In 1966, Ruttner & Ruttner, who had been studying the flight behaviour and congregation of honey-bee drones in Germany, first suggested that radar would provide a useful tool for their work, but were unable to obtain suitably portable equipment. Loper et al. working in Kansas and Arizona, USA, were later able to demonstrate the potential of conventional radar for bee studies, but also some of its limitations. They used a three centimetre (X-Band) modified marine radar, and found that they could successfully monitor drone activity at heights of between 15m and 32m above the ground. This enabled them to identify a number of 'drone congregation areas' and 'drone fly-ways'. They were also able to identify the paths of workers flying at high altitude.

They found however, that, despite the openness and generally flat nature of their site, flight in many areas and at low altitude was often obscured by 'clutter' from trees and undulations. In addition, they were unable to directly track virgin queens released into the drone congregation areas. Loper suggested that a miniature radio transmitter mounted on a bee would enable this to be done. An infra-red emitting device, apparently mounted on a honey-bee drone to illustrate its small size, and claimed to weigh 35mg, had already been announced by a team at Oak Ridge National Laboratory, Tennessee, USA in 1988 (New Scientist 22/9/88), but no examples of its successful use have yet been published, and to date, no other 'active' transmitters small enough to be carried by a flying bee have been developed.

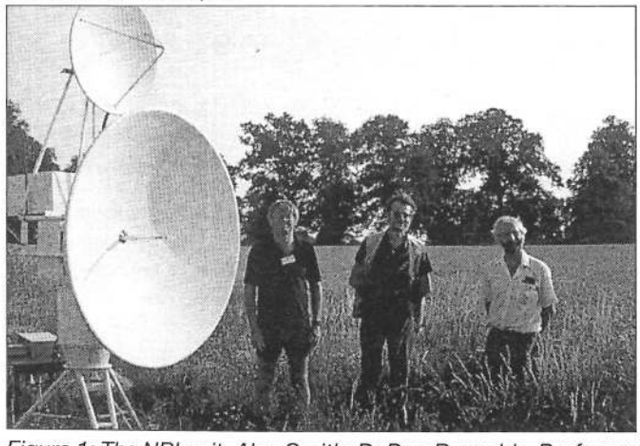


Figure 1: The NRI unit, Alan Smith, Dr Don Reynolds, Professor Joe Riley (left to right).

Recent developments with harmonic radar

Professor Joe Riley and his colleagues from the University of Greenwich have, over a period of nearly 30 years, successfully used a number of different conventional radar techniques to track insects, mainly tropical pests, flying at high altitude. The specialised radar equipment was developed by the University's Natural Resources Institute (NRI), at their radar Entomology Unit, based at Malvern UK (figure 1). When the need to track tsetse flies arose, a novel approach was required. Tsetse flies are relatively small and fly at low altitude, so reflections from ground features (clutter) prevent them from being tracked using conventional radar. The NRI team therefore developed a harmonic radar for this task. In this technique, a non linear conductor, such as a diode, is attached to a suitable antenna and is fixed to the target to be tracked. When this transponder is illuminated by a radar beam, currents at harmonic frequencies of the original signal are generated, and these currents re-radiate harmonics of the original signal. Suitably tuned, a radar receiver can detect this new signal even in the presence of vastly stronger clutter at the fundamental frequency. Because the energy for the transponder derives from the illuminating beam, the device does not need to contain a power supply, and so it can be extremely small. Harmonic transponders were first used successfully in an entomological context by Mascanzoi & Wallin, who used a 30cm wavelength harmonic direction finder to follow walking carabid beetles, although only from a range of a few metres. By 1995, Professor Riley's group had designed and constructed a three centimetre wavelength, azimuthially scanning, harmonic radar with a range of detection of 700m, and had produced matching transponders only 16mm in length and weighing just 12mg.

Tracking bees

Bee research has been undertaken at IACR-Rothamsted since the early 1920s, and since the early 1940s, studies of pollination have formed an important part of the work.

The pollination ecology group, currently led by Professor Ingrid Williams has gradually moved from investigation of the pollination requirements of alternative arable crops to studies of pollen and gene flow in model crops such as field beans and white clover. Professor Williams realised that the harmonic radar technique could be applied to studies of bee foraging behaviour, as it seemed likely the miniature transponders could be mounted on a large and robust flying insect such as a bumble bee

Figure 2: Bombus terrestris fitted with transponder.

(figure 2). Initial trials at IACR-Rothamsted in 1995, in collaboration with Professor Riley's group, showed that both bumble bees and honey-bees (figure 3) could be tracked over distances of several hundred metres, without any apparent effect on their flight characteristics or foraging behaviour. It was immediately apparent that the technique had great potential for use in bee flight and foraging studies, as well as in studies of other insect species.

Since 1995, Dr Juliet Osborne and colleagues at IACR-Rothamsted have been working on a project studying the foraging behaviour and ranges of bees in arable farmland. This work was prompted by the changes in land use which have occurred in the UK over the last 50 years, and which have severally reduced populations of wild bees, leading to possible problems of inadequate pollination of crops and wild plants. Attempts to stabilise this decline by providing food plants or nest sites, require knowledge of the foraging behaviour and foraging ranges of bees. Harmonic radar offered the unique prospect of looking in detail at foraging flights over longer distances.

In 1996, collaborative experiments were carried out at IACR-Rothamsted using the NRI harmonic radar to track the foraging ranges of commercially reared Bombus terrestris workers. Information on the speed, length, direction and straightness of flight was obtained from a total of approximately 100 tracks made by 21 individual bees. Although plots of attractive flowering crops were planted close to the two bumble-bee

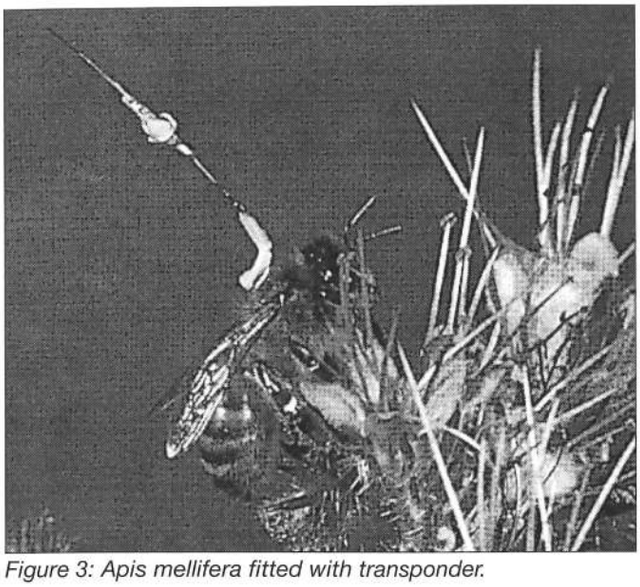


Figure 3: Apis mellifera fitted with transponder.

colonies used, the radar showed that individuals often flew to more distant sources. Some bees were tracked up to 550m from the nest, but may have flown further beyond the radar horizon. This demonstrates that bumble-bees often forage further away from their nest than has hitherto been supposed, as suggested by Dramstad. Analysis of pollen collected from the bees' bodies showed that they were constant to specific forage sources on successive trips. Combining the bee flight trajectories recorded by the radar, with data from a network of anemometers around the site, also provided information about bee flight speeds and how they compensate for wind drift.

For many years, Dr Gene Robinson and Dr Susan Fahrback of the Department of Entomology at the University of Illinios, USA, have been studying links between brain function and bee behaviour, especially the physical changes which occur in the corpora pendunculata, or mushroom bodies, as newly emerged bees increase in age. They have concluded that the observed physical changes are involved in supporting the bees' transition from working within the hive to the more challenging task of foraging, and may represent storage and use of spatial information obtained during flight.

During her PhD studies with Dr Fred Dyer at the Michigan State University, USA, Dr Elizabeth Capaldi studied the ability of both naïve bees and older, experienced foragers to learn the features of their landscape during orientation flights following release at various distances from their original hive location. The NRI harmonic radar again provided a unique opportunity to closely study these orientation flights and ultimately to relate flight behaviour to changes in the brain. During 1997, Dr Capaldi, now part of the team at the University of Illinios, came to IACR-Rothamsted to compare the flights of orientating and foraging honey-bees (figure 5). In her joint studies with IACR and NRI, she found that during the first week of adult like, bees were observed to leave the hive, turn to face it, hover backwards and forwards, whilst circling the hive, and then to make circling flights of varying distance for between 3-7 minutes before returning to the hive. The radar showed that the tracks of some bees were simple loops, whilst others were more complex. As the bees gained experience, tracks increased in length and become straighter until they resembled those of foragers. Analysis of these data for publication is still proceeding.

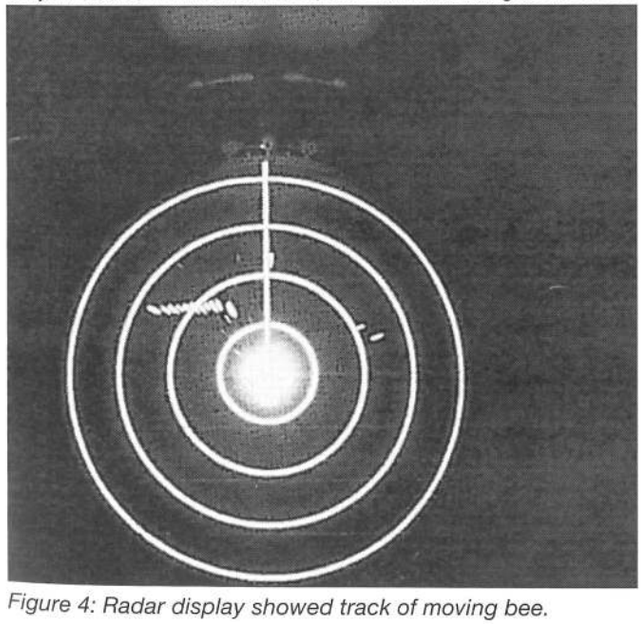


Figure 4: Radar display showed track of moving bee.

In 1998, in another IACR-NRI joint study, Dr Osborne observed the orientation flights of naïve B terrestris workers. Analysis of the tracks is not yet complete, but it appears that bumble bee orientation behaviour, although showing similarities to honey-bee orientation flights, may also show some important differences.

Whilst at IACR-Rothamsted in 1996, the NRI harmonic radar equipment has also been used to study the flight of nocturnal moths responding to pheromone sources. This work was part of a collaborative study between IACR, NRI and Dr Peter Valeur of the University of Lund, Sweden, and it was the first occasion on which nocturnal moth flight has been observed over any distance. The work was continued in 1998, where moth flight was studied in pheromone-treated areas. Also in 1998, the NRI team and Dr Glyn Vale of the Regional Tsetse and Trypanosomiasis Control Programme (Zimbabwe) carried out an experiment in which tsetse flies were finally successfully tracked using new ultra-light (<1mg) transponders.

There remain many potential applications of harmonic radar in the study of bee movement. In particular, simultaneous tracing of both drones and virgin queens would allow the study of honey-bee mating behaviour, providing answers to questions, such as the role of drone congregation areas which have interested beekeepers and bee scientists for many years. The patrolling behaviour of male bumble bees, and the flights of queen bumble bees while searching for nest and overwintering sites could also be studied.

Figure 5: Dr Beth Capaldi and Andrew Martin observing activity at the hive entrance.

Acknowledgments:

The harmonic radar work at Rothamsted has been funded by The Biotechnology Sciences Research Council of the United Kingdom, The British Beekeepers' Association, The CB Dennis Beekeepers Research Trust, The European Union Regional Tsetse and Trypanosomiasis Control Programme (Zimbabwe), the Leverhulme Trust, The United Kingdom Department for International Development Flexibility Fund, the University of Illinios, and The United States National Science Foundation. E Capaldi is supported by a National Research Service Award from the United States National Institutes of Health.

Norman L Carreck, Juliet L Osborne, Elizabeth A Capaldi, Joe R Riley

Marketing

Bill Floyd

Varroa!

I've kept out of the Eradication or Control Discussion: beekeepers and industry sector groups will decide what should happen for reasons that have nothing to do with marketing of honey or honey consumer values.

Once the decision is made, we'll look at the impact on honey in the marketplace and put in place appropriate strategies.

It's important to remember that Varroa is a beekeeping/animal husbandry issue and not a "quality of honey" consumer issue.

(There might be a negative perception in the minds of some consumers; but we'll address that with balanced information on what it means for the honey in the jar.)

Some of the world's finest and most expensive honeys in the world (for example, Tupelo, Lavender, Thyme) come from varroa infected hives: and, as I have said before, Canadian honey from varroa infected hives was selling on the world market for more than honey from New Zealand's (supposedly) varroa-free hives at the start of this year.

So don't let anyone tell you that varroa means less money for your honey: absolute slumgum! And simply a buying/negotiating tactic. There may, of course be reasons why someone wants to pay you less for your honey; but varroa shouldn't be one of them.

In fact, either eradication or control is going to see a reduction in the volume of honey produced in New Zealand. And this means the supply-demand situation is going to logically see honey prices firm or move up. However, as always, that will depend on individual circumstances and negotiations.

What is vitally important is that the varroa situation is not used to create a lessening of standards as regards the importation of honeys.

Varroa is only one issue. AFB and EFB, tracheal mites and the like are still serious issues and would be additional threats to the New Zealand beekeeping industry being able to provide the multi-billion dollar service to the New Zealand economy that it does.

Import standards must be 100% certain of maintaining our industry's integrity against those threats. Until then, no compromise, no imports! Full stop.

I must stress that the question of honeys being imported or not, is not a Marketing issue: it's about the health of a vital part of the NZ economy.

At least the varroa situation has fully established in the New Zealand public the (sometimes astonished) acknowledgment that the honey-bee is worth something like $8Billion to the New Zealand economy. And that most people's welfare in New Zealand depends to some extent on the friendly beekeeper and his or her hives.

One thing's for sure: The New Zealand beekeeping industry will never be the same again, whatever is decided.

Honey Research

I know there were some concerns from some quarters about our decision to collaborate with the USA's National Honey Board on research. But the results are now starting to come in!

Lead story on a major Health website: "A Honey of an Energy Lift" (see the Boxed article in this issue of *BeeKeeper* magazine).

And, for those that don't know: Capilano Honey is a major sponsor of the Australian Olympic Swimming Team.

Approaches by the New Zealand Honey Advisory Service to some professional sports nutritionists last year were treated with blunt disdain.

Going to be interesting when we go back with the results of the completed USA research on this project in October.

Arthur Lydiard sure did know what he was doing when he gave New Zealand's golden-era athletes honey as part of their pre-event diet.

The New Zealand Honey Research Unit met last month and reviewed all projects. It is quite exceptional what Peter Molan continues to achieve for our industry.

Peter is now working regularly with American and UK scientists (the New Zealand-based World Honey Institute is steadily becoming a firm reality) and some very exciting news is firming up for New Zealand beekeepers.

Because our prime focus now is on using the groundbreaking "sexy" results of the initial 'active Manuka honey research' to add value to New Zealand's bush and pasture blend honeys (the polyfloral Cinderella's of the New Zealand crop).

It is now starting to look like our bulk commodity blend honeys have an exceptional future! In doing the work for the USA, we are getting our own honeys tested as controls or because they fit the same profile as some USA honeys.

Most or all honeys in the world have glucose oxidise enzyme added by the Apis mellifera honeybee. But many plants have compounds in them that neutralise the enzyme's potential value.

We know that most "ordinary" manukas, rewarewa, bush blends, darker pasture honeys in New Zealand have this enzyme potential intact.

Peter is now looking at an hypothesis that these honeys, rich in the glucose oxidise enzyme, act as an immune booster in the human body. The collaborative research Peter is doing with a UK immunologist is indicating this.

This will explain why honey can alleviate diahorrea and why help cure colds and flu.

It also seems that honey could act as an insulin substitute and stimulate cell growth! This means honey could help build body mass; and be a legal steroid substitute.

Wow!... I mean... whew! What price honey with those values!

Classy Gourmet Honeys

But honey is more than fabulous functionality. It's also one of the ultimate gourmet foods. And none is proving that better than two very professional honey marketers, Airborne Honey and Honey & Herbs.

Airborne Honey has added a number of North Island honeys to their premium range. And I was thrilled to see it given prime shelf position in a number of supermarket chains, beautiful labels and honeys that really are different to each other. Good to see a company that is taking varietal integrity seriously doing so well! And as for Honey & Herbs, their Tipsy truffles, their delightful comestibles, their honey-based toiletries and skin care products, are simply world class!

Tried their Lemon and Gin Chutney (features Manuka Honey) with some smoked chicken, absolutely, utterly delicious!

Companies like these two show the future for New Zealand: great to see them doing well.

Mystery Creek Field Days

Next *BeeKeeper* will hopefully have some photos of the New Zealand Honey-bee display at the Field days. Fiona O'Brien and the Waikato NBA team look on track to create an event that will make us all proud to be in this industry!

More on the Field days, with photos, in next month's *BeeKeeper.*

Branch Meetings

I was fortunate to be in Hamilton at the same time as the Waikato Branch's AGM so I was able to speak at that. We have a limited budget, and can't travel around New Zealand just to Branch meetings. But it's sometimes possible to coordinate 'trips'.

If Secretaries could let me know when AGM's and Field Days are being held, it may be possible to attend some of them.

Honey Chef Classes

The very successful chef training classes in Christchurch are now being done for the NBA by Airborne Honey so it's no longer a cost from the marketing budget.

We'll now look at starting a set of classes with another Polytechnic in another part of New Zealand and once they're set up invite a honey Brand to take that over as well.

In this way, over a few years, we can develop a national network of honey chef training classes. Without huge cost to the industry.

And my honey of the month...

Two mentions. Firstly to the Bald Bee Company (Chas and Pamela Reade) for the way they've used manuka honey in that superb Lemon and Ginger Chutney.

Secondly, Clissold's Clover Honey. (Yep... I'm a Mainlander... my clover addiction will out from time to time!). Anyway I got some of that fabulous cloud white and nimbus fluffy gentle honey with the apple juice spritzy aftertaste, hot crumpet, melting butter, Clissold's out of the fridge ice cold... aaaahh... that pleasures of the palate can be so simple, cost so little, and be so good.

Ooops. Got a bit carried away then. More next month... and see many of you in Gisborne!

Regards
Bill Floyd

AUCKLAND REMIT VOTING MEETING

Date: 29 June 2000

Time: 7.30pm

Venue: Ceracell Beekeeping Supplies
24 Andromeda Cres
East Tamaki
(off Kerwyn Avenue)

Business: Selection of Delegates
Voting on remits
Varroa
General business

A honey of an energy lift

Reprinted from www.Healthscout.com Tuesday, May 2.

If you're exercising hard and gulping sports "nutrition" gels to keep from getting tired, you may be better off with nature's own energizer - honey.

If you eat honey less than an hour before you exercise, you may not wind up as exhausted as you would be if you took other simple sugars or supplements, says a new study.

Consider Katharine Switzer, who regularly uses honey when she races. She is program director of the Avon Running Global Women's Circuit, has run 35 marathons and in 1974 won the New York City Marathon.

"I'm a honey user anyway and have been for years," she says. "A substance that's been around for thousands of years can't be all wrong."

As a supplement, says Switzer, honey is versatile and seems to work better than other supplements with high sugar contents.

"It has the potential to be a good energy source," says Conrad Earnest, vice president of human sciences at IMAGINutrition, of Aptos, Calif. "It is not going to blunt or hamper" an athlete's performance.

Researchers at IMAGINutrition co-wrote the paper, which examines the effect of carbohydrate gels, compared to honey, on blood sugar — glucose — and insulin.

Some people in the study took gels containing one of the following sugars: fructose, dextrose, sucrose, maltodextrin or honey. Others ate the commercially available product, PowerGel, or just took a placebo. Blood tests were taken at intervals for up to an hour after the substances were eaten.

Not everyone was sold on honey as a solution for exercise fatigue.

"At best it's a preliminary study," said Donald K. Layman, a professor of nutrition at the University of Illinois at Urbane-Champaign. "I don't think we can jump to it being some sort of miracle. That would be premature."

The study indicates that glucose, the body's main food source, is released more slowly into the blood after honey consumption. Slow release of glucose is a plus, said Earnest, because when glucose is released too rapidly the body increases its production of insulin.

Insulin, in turn, causes a "rebound hypoglycemia," actually decreasing the amount of glucose in the blood over the long haul. It also causes muscles to use their internal stores of energy, called glycogen, faster.

The study, presented recently at the annual Experimental Biology meetings in San Francisco, was sponsored in part by the National Honey Board.

"It's not like the energy you get from a cup of coffee, where you feel more awake or more active," said Earnest. "It's about when push comes to shove and you have to go longer and work harder than the guy next to you."

Layman, however, stressed that honey may have some features that call into question its ability to provide a long-term lift. Honey, he said, contains one molecule of fructose and one molecule of glucose. This is why honey tastes sweeter than sugar; fructose is sweeter than glucose. But fructose is not as readily available to the muscles.

"Fructose is not metabolized like glucose," said Layman. "It doesn't stimulate insulin. Likewise, it's probably not much of an energy source."

Switzer disagrees. "It's an instant energy source and it's something I like to take because I don't get an artificial sugar rush."

For those with no dietary constraints, there is no downside to eating honey before exercise. However, it should not be substituted for meals or depended on as a primary source of energy during endurance training.

Previous HealthSCOUT stories have detailed how honey may be a healer and how engineered honey may someday carry drugs.

Check out the National Honey Board for more on this ancient power source or see what GetFit has to say about athletic performance.

Honey-bee biology

The drone: A misunderstood male

Part II

In part I of this article on drones, we began by looking at how people regarded drones, often with disdain, and then proceeded to take a more rational approach in examining their biology. Let's continue now with the drifting of drones.

When I watch my drones returning to an apiary, I know they do not always enter their original hive, but rather may drift to other hives. In estimating drone drift, results have been variable. Some studies report a low amount of drift (0-12%) while others report a higher amount (50-80%). These estimates probably depend on several factors including the arrangement of the hives in the apiary, the age of the drones that were caught, the terrain of the study area, and other environmental conditions. Drifting drones have been implicated in the spread of tracheal and varroa mites as well as sacbrood and *Nosema*[1]. Consequently, drone drift is an important consideration in studying the spread of diseases and parasites in honey bee populations.

By the autumn season, bees typically evict their drones, a process that usually occurs slowly over the preceding weeks or months (depending on local conditions). In contrast, finding normal size drones during winter or early spring inspections makes me suspicious that the colony is queenless. Queenless colonies will retain their drones over the winter. I think other queenright colonies, yet having queen problems that may not be obvious, fail to evict their drones. For example, consider two identical situations found during my late autumn inspections last year. Out of all my colonies, only two colonies retained their drones. Without knowing their situation, a superficial inspection would probably reveal nothing more than

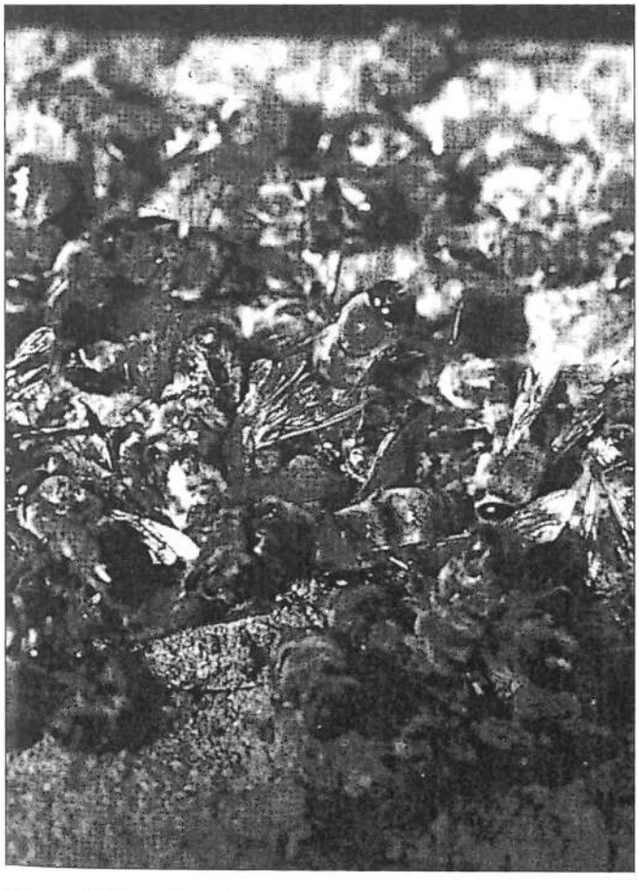


Figure 1: Evicted dead drones in front of the hive.

Figure 2: A drone cleaning his antennae before flight.

small broodnests with mediocre broods patterns, perhaps not too surprising as broodrearing was drawing to a close. However, these were special colonies that I was following closely. Each colony had a two-year old artificially inseminated queen. I was maintaining these queens for future experiments. Even though the colonies were strong and healthy, the bees occasionally tried to supersede their queens. Knowing their case histories, I inspected them closely. First I found both (marked) inseminated queens, still in good condition. Looking closely at the combs, I found partially dismantled queen cells indicating at least some recent queen rearing. So I looked carefully among the bees, and in each colony, I found a recently emerged daughter queen bee. Apparently, according to the bees' perception, there was a problem with the old queens. Presumably the reduction of pheromones from the older queens, mimicking somewhat a queenless situation, caused the bees to retain their drones.

Drone eviction can also occur at other times when nectar is scarce. In my apiary locations (Piedmont regions of Virginia and North Carolina), rainy periods occur in the spring. If this inclement weather persists after the initiation of drone rearing, sometimes the bees will begin evicting adult and pupal drones, letting them pile up on the alighting board and immediately in front of entrance. If I see these evicted drones in the spring, I suspect the bees have not been able to forage or possibly the colony is near starvation.

In my apiaries lacking a sizable summer honey flow, I typically find a fair number of drone eggs, virtually no larvae, a small number of pupae and only a few adults. In other words, a large number of drone eggs disappear. It is known that workers eat drone eggs possibly as a regulatory mechanism to adjust drone production to prevailing ecological resources[2]. Eating eggs in this context is termed oophagy and is a form of cannibalism.

The bees also reduce the number of adult drones. It appears they deny the drone's access to the honey combs. Sometimes hundreds of weakened drones collect on my bottom boards before workers remove them over the following weeks. For my other apiaries, large cotton fields provide a steady supply of nectar for most of the summer. These colonies tend to retain their adult drones with all immature stages present.

An abrupt end to the honey flow can cause rapid drone eviction with dead drones accumulating in front of the hive (see Figure 1). Once near the end of the main honey flow, I moved some colonies for cucumber pollination, placing them on a patch of bare ground. A few days later, I returned to check them. Even before I stopped the truck, I could easily see hundreds of dead bees scattered upon the bare ground. At first I thought the worse: Maybe it was a pesticide kill. I stopped the truck and sat there contemplating a bit more. In this area and at this time of year pesticides have not been a problem. Furthermore, these bees had been in honey flow and then abruptly moved to an area with poor forage. Maybe those dead bees were not workers - but rather drones. Walking among the colonies, I saw that, sure enough, they were drones. As my pesticide fears diminished, I knew my bees had just quickly evicted their drones. These situations are consistent with this general observation: The presence or absence of adult drones, pupae, larvae, and eggs can indicate the nutritional condition of a queenright colony in the recent past[3] (except possibly during the autumn). Now let's examine some of the drone's anatomy and see how they are designed for mating.

Compared to female honey bees, the drone's compound eyes are much larger. Among different species of bees, males that acquire mates by patrolling in flight (as drones do) tend to have larger eyes. Some males of other bee species (non-honey bees) wait for females by perching at designated territories. These male bees tend to have smaller eyes[4]. Thus the large eyes of drone appear as a specific adaptation for aerial mating.

The flying virgin queen emanates a specific scent, or sex pheromone. On the drone's antennae are specific receptor sites complementing the shape of the molecules in the pheromone[1]. Consequently drones have a keen sense for this material, and not surprisingly, it is very attractive to them. Pausing on the alighting board before each flight, drones clean their antennae, presumably increasing their sensitivity (see Figure 2).

Using the queen's sex pheromone, a drone can detect her high up in the sky. Interestingly, the drone is not attracted to a virgin queen in the hive or as she flies near the hive entrance, probably because the pheromone is not in its proper setting or context. At the hive entrance, I have watched many queens leave and return from mating flights, while nearby drones ignore them.

In contrast to anatomical features for enhancing mating ability are structures lacking in drones, as compared to workers. Drones do not have wax glands, scent glands, pollen baskets, stingers, and only have a short tongue. As I see it, the drone *specialises* in mating and would not need these anatomical structures. However it is known that being stingless has a different origin. The stinger is actually a modified egg-laying device (an ovipositor), and drones, being male, would not possess it. Hence they are stingless. What some beekeepers do not realise is that drones without stingers are only a special case of more general rule: All male bees, wasps, hornets and ants cannot sting. Beekeepers handle drones, confident of not being stung, but what about picking up a male wasp? For most people, just picking up any wasp would be insane. However, in late summer, male paper wasps emerge and forage on aster and goldenrod. I always look forward to this time of year.

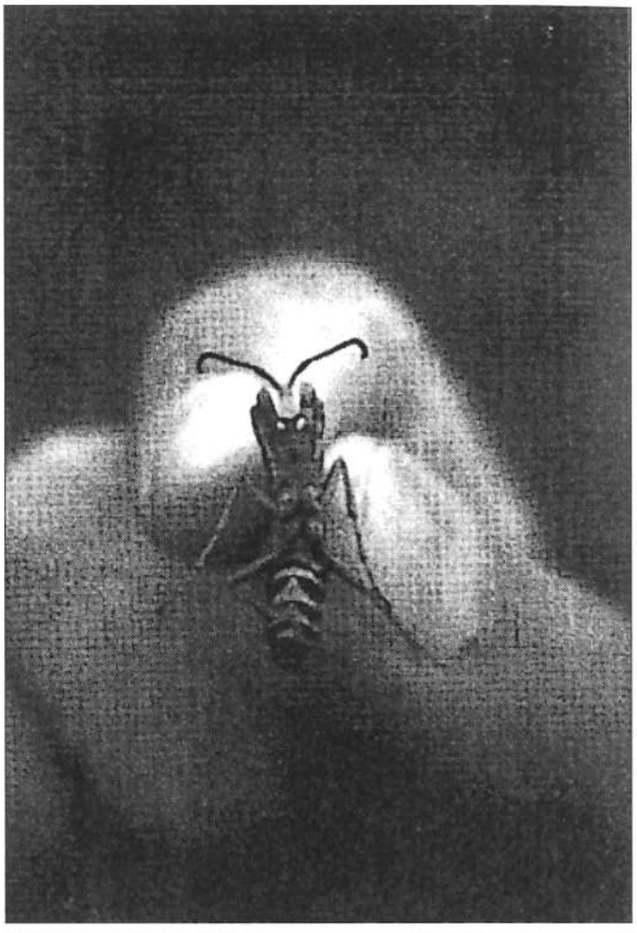


Figure 3: Holding a male wasp (genus Polistes). One needs special training to distinguish male and female wasps. So don't try picking up wasps at home or anywhere else for that matter.

Walking among the flowers, I pick up the male wasps, holding them briefly before letting them go (see Figure 3). When held, a male wasp arches its abdomen, and the tip touches my skin. I brace myself for a devastating sting - but nothing happens. The external differences between male and female paper wasps are slight. So to avoid a painful sting, one must be trained to see these details, not an easy task as a nervous wasp flits from flower to flower. Sometimes in the company of friends I like to entertain them with my wasp-catching ability. If I happen to snatch up a female wasp, well then I *really* entertain them. I also like catching different species of male bees by hand (see Figure 4). Male carpenter bees are among my favourites. As they hover waiting for females, I gently snatch them up. Once while trying to impress my wife Suzanne, I caught seven male carpenter bees, in both hands, before letting them go.

As a teenager and avid student of biology, I knew males of the Hymenoptera (the bees, ants, wasps, etc.) could not sting. Armed with this bit of knowledge, I kept a very unusual pet - a giant male hornet *(Vespa crabro)*. In sight and sound, his features commanded respect and fear: By insect standards he was huge, about an inch and a half; clad in shades of orange, his colours warned others to leave him alone; and his low ominous buzz permeated the air, announcing his presence. Yet I handled him with impunity, fed him apple juice and showed him to my friends. Adolescent society held this unique feat in high regard. Even the schoolyard bullies had more respect for me, but regrettably that effect was only temporary. After a few weeks, it was business as usual.

Now we live in the age of varroa mites - a time wrought with changes and uncertainty, and a time forcing further realisations on the drone's importance. Drone brood is very attractive to reproducing varroa mites. Young adult drones, parasitised as brood, have a higher death rate during the time they become

sexually mature. While Apistan® has saved countless thousands of colonies from varroa mites, it has also been implicated in raising the death rates of young adult drones during this time. This drone death looms as a potential problem where large numbers of them are needed for mating many queens in a commercial operation.

Possibly in some commercial queen operations, elevated drone death rates from Varroa and Apistan® may have reduced the number of drones. The once numerous feral colonies have been decimated by Varroa. Some of these feral colonies probably supplied drones from mating queens in nearby commercial operations. Under these conditions, people naturally wonder whether enough drones are present to mate with these queens. Queens not mating with enough drones are quickly superseded when put in commercial colonies. With these problems in mind, along with normal drone mortality, now the recommendation is to supply 60 drones for each virgin queen[5]. Not only does Apistan® adversely affect drone production, but formic acid gel, another chemical that helps control Varroa mites, also decreases drone production[6].

This article recounts some of the ways we have thought about drones for the past 400 years. Long ago drones were despised even to the point of being trapped and killed, although for much of the time they have been largely ignored and their presence taken for granted. But now with varroa and miticides, maybe we should be more careful with the health of our drones. If we view the drone as a creature specialised for mating, he is just as important as a fully mated queen who is specialised for egg laying.

Acknowledgments

The author thanks Suzanne Sumner for her comments on the manuscript.

References

[1]Currie, RW (1987) The biology and behavior of drones. Bee World. 68(3): 129-143.

[2]Kukuk, PE (1992) Cannibalism in social bees. In Elgar, MA and BJ Crespi (eds). Cannibalism ecology and evolution among diverse taxa. Oxford University Press, Oxford.

[3]Taber, S (1973) Drones - Their value to you. American Bee Journal. 113(8): 302.

[4]Roubik, DW (1989) Ecology and natural history of tropical bees. Cambridge University Press, Cambridge.

[5]Rinderer, TE, LI De Guzman, VA Lancaster, GT Dellatte and JA Stelzer (1999). Varroa in the mating yard: I. The effects of Varroa jacobsoni and Apistan on drone honey bees. American Bee Journal. 139(2): 134-139.

[6]De Guzman, LI, TE Rinderer, VA Lancaster, GT Dellatte and JA Stelzer (1999). Varroa in the mating yard: II. The effects of formic acid gel formulation on drone production. American Bee Journal. 139(4): 304-307.

By Dr Wyatt A Mangum
Mathematics Department
Mary Washington College
1301 College Avenue
Fredericksburg, Virginia 22401-5358
Email: wmangum@mwc.edu

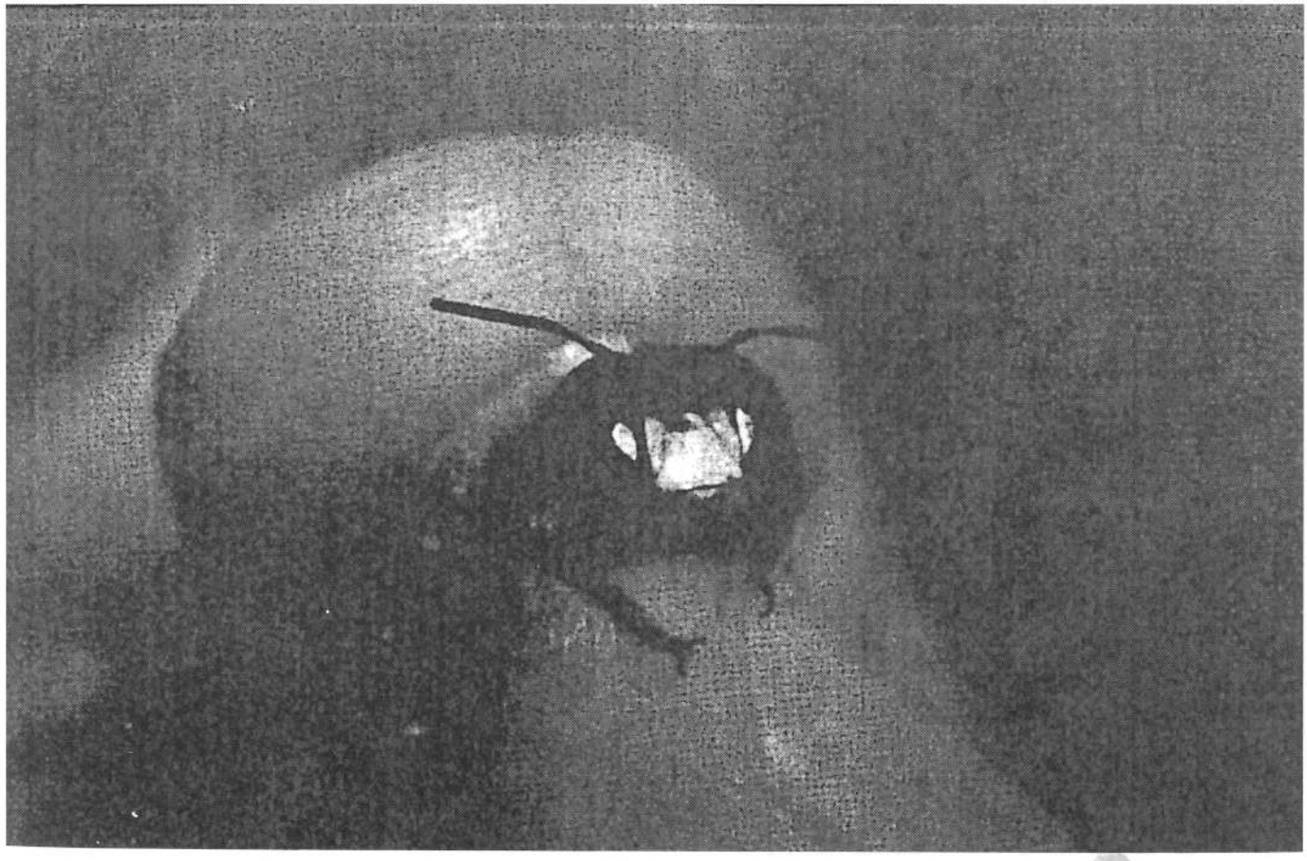


Figure 4: Holding a male Carpenter bee (Xylocopa viginica). This male bee with his yellow face is fairly easy to distinguish from a female having a solid black face.

Pathogenic fungi
A new way to fight the mite?

An effective and sustainable alternative to chemical control of varroa is now in demand, as acaricide-resistant mite populations advance across the European mainland. The potential contamination of bee products with these chemicals is a further concern for many beekeepers. In 1998, MAFF announced that it was to fund a four year research programme to search for and develop a biological control agent of varroa (BEEKEEPING, June/July 1998). This collaborative project between IACR-Rothamsted and HRI-Wellesbourne has already produced some exciting and encouraging results.

How does fungus work?

Fungi are the most promising natural enemies of varroa. Some species of fungi - called "entomopathogenic" fungi - can be very successful at controlling insect and mite pests. In nature, fungal infections are established when spores attach to and germinate on the host cuticle. The host dies when germ tubes, produced by the spores penetrate the cuticle and produce more spores on the surface of the cadaver. These spores may spread to other individuals in a population, allowing an infection to be self-perpetuating. At least 13 commercial fungal products have already been developed for specific pests in horticultural and agricultural systems, consisting of spore formulations that are applied directly to the target.

The search begins

Our project began with a world-wide hunt for fungi that may infect and kill varroa. Only one fungal natural enemy has been recorded from varroa, so the search had to focus on fungi that are active against other mite species. A literature review uncovered no less than 57 species of fungi that were reported to infect over 70 species of mites. From these over 40 candidate strains of fungi have now been obtained from fungal culture collections around the world, and have been catalogued and preserved for use in this project.

Temperature testing

Fungi grow and sporulate only within certain temperature and humidity ranges. To ensure that our selected strains would infect and grow within a honey-bee colony, an important first step in the project was to test the activity of selected strains under expected colony conditions.

Ensuring our mite supply

An experimental method - or bioassay - was then developed to measure the susceptibility of varroa to fungi, and an intensive screening programme initiated. Mites for bioassay were reared in honey-bee colonies in the field. After being artificially infested, colonies were manipulated to ensure a regular supply of large numbers of mites throughout the season. Once this was achieved, a sensitive and repeatable laboratory technique was devised that enabled 40 of our candidate fungi to be tested.

Testing the fungus

In October 1999 the initial bioassays were completed and an encouraging number of positive results were obtained. In comparing all the different fungi, we looked at the total number of mites killed by each fungus, and the speed at which they were killed. Our results showed that 18 out of the 40 strains killed 100% of treated mites. All these strains killed mites within seven days.

Future plans

Our work over the next three years will focus on the most promising candidates selected from this year's studies. Most importantly, we will test for any negative effects on honey-bees and other non-targets such as ladybirds and parasitoids. Laboratory tests will also enable us to find the best dose rates of selected fungi, and to study the infection process in more detail. Application methods in the field will also be evaluated in order to develop an efficient delivery system for the control agent.

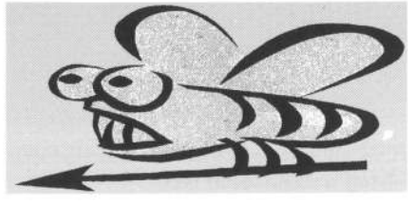
In the future, biology acaricides may provide beekeepers around the world with another means of fighting the mite. With such a productive and exciting first year, we are optimistic about the future success of the project. There is still much to be achieved, but we are hopeful that our research could lead to the development of an effective, sustainable and environmentally benign method of varroa control.

Collaborates:
Gillian Davidson[2], Brenda Ball[1], Judith Pell[1], Dave Chandler[2], Norman Carreck[1], Keith Sunderland[2].

[1] Entomology & Nematology Department IACR-Rothamsted, West Common, Harpenden, Herts, AL5 2JQ.

[2] Entomology Sciences, Horticulture Research International, Wellesbourne, Warwick. CV35 9FF.

Katie Shaw, IACR-Rothamsted



Honey situation and outlook in selected countries

Honey production in six major producing countries in 1999 is forecast at 495,500 metric tons, an increase of three percent from the 1998 output. Two of the world's largest honey producers, China and Agentina are expecting higher production, which will more than offset production declines in the United States and Canada. China, the world's largest honey producer, is expected to recover from a significant production decline in 1998, rising 16 percent to 180,000 metric tons. Honey exports for 1999 from selected countries are forecast to increase by about six percent to 215,000 metric tons. Argentina is forecast to increase exports in 1999 to 75,000 tons, as domestic production is forecast at record levels. Production in the United States is forecast to decrease by 10 percent to 90,000 tons due to unfavourable weather conditions in 1999. United States honey exports in 1999 are forecast at 4,000 tons. Major United States markets are Saudi Arabia, Yemen, Canada, and Germany. United States imports in 1999 are forecast at 77,000 tons, an increase of 28 percent from the previous year's level.

Argentina

Honey production in 1999 is forecast at a record 85,000 tons, 13 percent above the revised 1998 output. Unfavourable weather conditions during 1998 negatively impacted honey production and decreased yields from 38.9 kg/colony to 35.7kg/colony. However, these weather conditions were not as severe as first expected and the 1998 production estimate was raised by 25 percent, to 75,000 tons. Argentina is the only major producing country in which the number of producing colonies is growing, with growth at 22 percent over the past three years.

In response to the higher production, exports in 1999 are forecast at 75,000 tons, eight percent higher than the revised 1998 shipments. Most Argentine honey is exported in bulk in 300 kilogram drums, with only a small amount of honey packaged in jars and exported to Brazil. Honey is exported during the entire year with the heaviest export flow taking place between March and May. The United States and Germany are the main export markets, accounting for 75 percent of total shipments. Other key export markets include Spain, Italy, the United Kingdom, and Japan.

Only about eight percent of Argentina's honey production is consumed domestically. In 1999, honey consumption is forecast to be boosted by the high availability. Generally, Argentine consumption fluctuates widely in relation to the level of production and exports.

Canada

Canada's honey production in 1999 is forecast at 34,000 tons, 20 percent below the record 1998 output. Favourable rainfall and temperature conditions in the major Canadian honey producing areas resulted in good conditions for bee activity and above average yields, though not matching last year's record harvest.

Canada's honey exports in 1999 are forecast at 15,000 tons, 34 percent above the previous year's shipments, as high carry over stocks remained available for export. The United States and Germany are expected to account for most of this increase. Canada has no quantitative restrictions on honey imports from the United States, but market opportunities for United States honey remain limited, reflecting Canada's surplus production position and a strong United States dollar.

China

China's honey production in 1999 is forecast at 180,000 tons, an increase of 16 percent over the previous year. This level of production would signal a return to average production levels, recovering from the poor 1998 harvest, which was adversely affected by poor weather conditions and bee diseases.

Chinese exports are forecast at 80,000 tons in 1999, a two percent increase from 1998. According to the Honey Suspension Agreement between the United States and China, the price for honey exported from China to the United States was determined by a reference point set three months prior to actual trading. Exports to all destinations are forecast to increase slightly in 1999. The largest markets for Chinese honey are Japan, the United States, Germany, Belgium, and Spain.

Germany

Germany's honey production in 1999 is forecast at 13,000 tons, 20 percent below the previous year's output of 16,306 tons. The 1998 production estimate was raised by nine percent as poor weather did not have as severe effects as initially expected. National production potential continued to decrease as the number of apiarists and number of commercial colonies have both slowly declined in recent years.

Germany, the world's largest importer of honey is forecast to decrease imports slightly in 1999, to 91,000 tons, because of high stock levels built up in 1998. The bulk of imports are from Argentina, China, Mexico and arrive in large containers that are processed further before domestic sale or re-export. Imports from the United States in 1998 totaled 585 tons. The German market provides opportunities for United States honey processors, especially if the honey is marketed in attractive jars (ie. Appealing to children) or plastic containers in consumer-friendly sizes.

Mexico

Honey production in 1998 is forecast at 57,500 tons, three percent above the 1998 estimate. The increase in production in 1999 is mainly due to favourable weather conditions in Mexico's major honey producing regions, in addition to the gradual improvement in pest control and modernisation of the industry.

Mexican producers are currently gaining knowledge and experience in dealing with the serious problems of the Varroa mite and the Africanisation of apiaries. Small and non-traditional hobbyist producers continue to leave the industry because of lack of experience with these problems, while the remaining producers are more equipped to implement the necessary control practices. However, production of queen bees, which are used to prevent Africanisation of beehives, is still insufficient to cover domestic demand.

Exports of honey in 1998 are forecast at 29,000 tons, 10 percent above 1998 shipments. Major export markets for Mexican honey include Germany, the United States, the United Kingdom, and Saudi Arabia. Mexico's honey industry largely focuses on international markets because honey is more expensive than other sweeteners, such as sugar, for us in the domestic sweetener market.

United States

The first official estimate of 1999 United States honey production, based on an objective survey, will not be available from the National Agricultural Statistics Service (NASS) until February 2000.

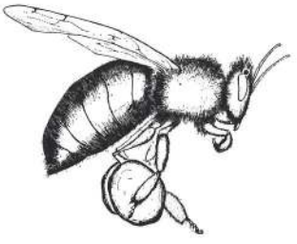
Weather conditions were variable throughout the country for the 1999 season, with yields expected to decrease slightly. Most sources expect production in 1999 to be approximately 90,000 tons, 10 percent below last year's output. Nearly half of all bee colonies and more than half of all United States honey production in the United States is located in California, Florida, Minnesota, North Dakota, and South Dakota.

According to industry sources, the number of apiarists and bee colonies continue to decline due to increasing losses for mites and other diseases and rising production costs. Small apiarists continue to leave the market because of low prices and the increasing cost and time needed to maintain colonies that are highly productive and free of pets.

Export of United States honey in 1999 are forecast at 4,000 tons, a 15 percent decrease from last year's shipments and roughly equal to 1997 exports. United States imports in 1999 are forecast at 77,000 tons, a 28 percent increase from 1998.

The United States is one of the world's largest markets for industrial honey. This sector accounts for approximately 45 percent to total domestic consumption. The primary users of industrial honey are bakery, health food, and cereal manufacturers. Other users, such as the food service industry, account for another 10 percent of domestic consumption. Individual consumers, who purchase small amounts of honey for personal use also significantly contribute to overall consumption in the United States.

The FAS Attache Report search engine contains detailed reports on Honey for all the countries described above. For information of production and trade, contact Mark Petry at 202 720-0897. For information on marketing contact Yvette Wedderburn-Bomersheim at 202 720-0911.



Beekeepers Beeware

Chinese propolis is being imported into New Zealand, processed locally, and is being sold on the local market as a product of New Zealand.

This has serious implications on the value of New Zealand propolis as it is creating confusion in the marketplace as to the quality of our own product. New Zealand propolis is now recognised as one of the highest quality propolis in the world, whilst Chinese propolis is quite the opposite.

We have recently been supplied several samples of product, supposedly from New Zealand, and on close examination have found them to be of Chinese origin.

We would strongly recommend that all beekeepers lobby their local NBA representative to implement some importation control mechanism before this impacts on what has become a valuable asset in the beekeeper's annual hive production. As a first step, we would urge beekeepers to support only those companies who are actively only processing New Zealand propolis.

For information on our prices and contact details, see the advertisement below.

Phil Caskey
Bee & Herbal New Zealand Limited

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RECIPES

Bubbie-Style Yellow Cake

Nonstick cooking spray
1 1/2 cups vegetable oil
2 cups plus 2 tablespoons sugar
1/4 cup honey
6 eggs, at room temperature
2 tsp vanilla extract
1/4 tsp almond extract
1/4 tsp orange extract (optional)
2 tsp finely minced orange zest (optional)
4 cups all-purpose flour
1/2 tsp salt
5 tsp baking powder
1/2 cup warm milk or orange juice
3 tsp cinnamon
2 tbsp coarse or granulated sugar
1/4 cup shredded or grated semisweet chocolate

Preheat the oven to 350°F. Generously coat a 9 or 10 inch bundt or angel food cake pan with nonstick cooking spray. In mixing bowl, stir together the oil, sugar, honey and eggs. Stir in the vanilla and almond extracts and orange extract and zest (if using). Fold in the flour, salt, baking powder and milk or orange juice until blended.

Spoon one-third of the batter into the prepared pan and dust with 1 1/2 teaspoons cinnamon. Repeat this process, using another third of the batter and the remaining cinnamon. Then spoon on the remaining batter and sprinkle the top with the sugar. Top it all with the chocolate. Place the pan on a baking sheet and bake in the preheated oven until a cake tester inserted in the middle comes out clean, 55 to 65 minutes. *(16 servings)*

Halvah 'n' Honey Phyllo Cheesecake

For the phyllo crust:
12 frozen pastry sheets, thawed*
4 ounces (1 stick) unsalted butter, melted

For the filling:
1 1/2 pounds cream cheese, at room temperature
4 eggs
1 egg yolk
1/4 cup sugar
1/4 cup honey
1 tsp vanilla extract
2 tbsp plain yoghurt
1/2 tsp sesame oil
1/4 cup flour
1/3 cup pistachio nuts, coarsely chopped (optional)
3/4 cup vanilla halvah, coarsely chopped **

For the garnish:
2 to 3 tbsp honey, slightly warmed
1/4 cup sesame seeds, lightly toasted
1/2 cup finely chopped pistachio nuts

Have ready a 9 or 10 inch spring form pan. Preheat oven to 350°F. For the phyllo crust: Brush one sheet of phyllo lightly with the melted butter. Line the pan with the phyllo sheet, starting from the centre of pan and pressing it into pan. Allow the excess to drape over sides. Repeat, brushing each sheet with melted butter, to create four more layers of phyllo sheets, one on top of another. (If your brand of phyllo sheets of small dimension, follow the same procedure but arrange overlapped sheets to achieve at little excess draping or overhang.) Reserve and refrigerate remaining sheets.

For the filling: In a medium bowl of an electric mixer, cream together the cream cheese, eggs, egg yolk, sugar, honey, vanilla, yoghurt, sesame oil and flour until smooth. Stir in the nuts and halvah. Pour the batter into the prepared phyllo shell. Trim the phyllo overhang to just rest on rim of pan. Bake until cake is set, about 45 minutes. Meanwhile, cut the seven reserved refrigerated phyllo sheets into quarters and brush with butter. Remove the cake from the oven and increase the temperature to 400°F. Arrange the buttered phyllo sheets on top of cake in an irregular patchwork. The cake's surface should be covered. Return the cake to the oven to brown, eight to 10 minutes. Remove from the oven and chill the cake until set, about eight hours or overnight. To serve, warm the honey, drizzle it over the cake then garnish with toasted sesame seeds and pistachios.

**Note:* Phyllo (or filo) dough, found in the frozen food section of many supermarkets, needs to thaw in the box at room temperature - it takes about four hours. Do not open the box until all other ingredients are assembled and you are ready to work. Then carefully unroll phyllo sheets onto a smooth dry surface. Immediately cover phyllo with plastic wrap, then a damp towel. Work with one sheet at a time, keeping the remaining sheets covered.

***Note:* Halvah, a Middle Eastern confection made from ground sesame seeds and honey, is found in most supermarkets. *(16 servings)*

Honey-Spice Chocolate Marble Cake

Nonstick cooking spray

For the honey-spice batter:
1 3/4 cups all-purpose flour
1 1/2 tsp baking powder
1/2 tsp baking soda
1/4 tsp salt
1 1/2 tsp cinnamon
1/4 tsp cloves
1/4 tsp allspice
1/2 cup vegetable oil
1/2 cup honey
3/4 cup granulated sugar
1/4 cup packed brown sugar
2 eggs
1/2 tsp vanilla extract
1/2 cup brewed tea
1/4 cup orange juice

For the chocolate batter:
1 1/2 cups all-purpose flour
1 1/2 tsp baking powder
1/2 tsp baking soda
1/4 tsp salt
1/3 cup cocoa powder, measured then sifted
1/2 cup vegetable oil
1 cup granulated sugar
1/2 cup packed brown sugar
2 eggs
1 tsp vanilla extract
1 cup flat cola

For the garnish:
1/2 cup grated semisweet chocolate (about 2 ounces)
Confectioners' sugar (optional)

Preheat the oven to 350°F. Generously spray a 9 or 10 inch bundt or angel food cake pan with nonstick cooking spray.

For the honey-spice batter: In a large bowl, combine the flour, baking powder, baking soda, salt, cinnamon, cloves and allspice. Make a well in the centre and stir in oil, honey, both sugars, eggs, vanilla, tea and orange juice. Blend well to make a smooth batter. Set aside.

For the chocolate batter: In a large bowl, combine the flour, baking powder, baking soda, salt and cocoa. Make a well in the centre of the flour mixture and add the oil, both sugars, eggs, vanilla and cola. Blend well until the liquid ingredients are incorporated into the dry to form a smooth batter. Pour the honey-spice batter into the prepared pan and then top with the chocolate batter. (The heavier chocolate batter will sink into the honey batter and marbleize during baking.) Place the cake on a baking sheet and bake until done, 44 to 65 minutes, or until cake springs bake when gently touched. Cool for 10 minutes then unmold and place on a serving platter. While cake is still warm, sprinkle on grated chocolate and allow it to melt. If you like, chill the cake to set the chocolate and then dust with confectioners' sugar. *(16 servings)*

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Sth Brighton, Christchurch
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