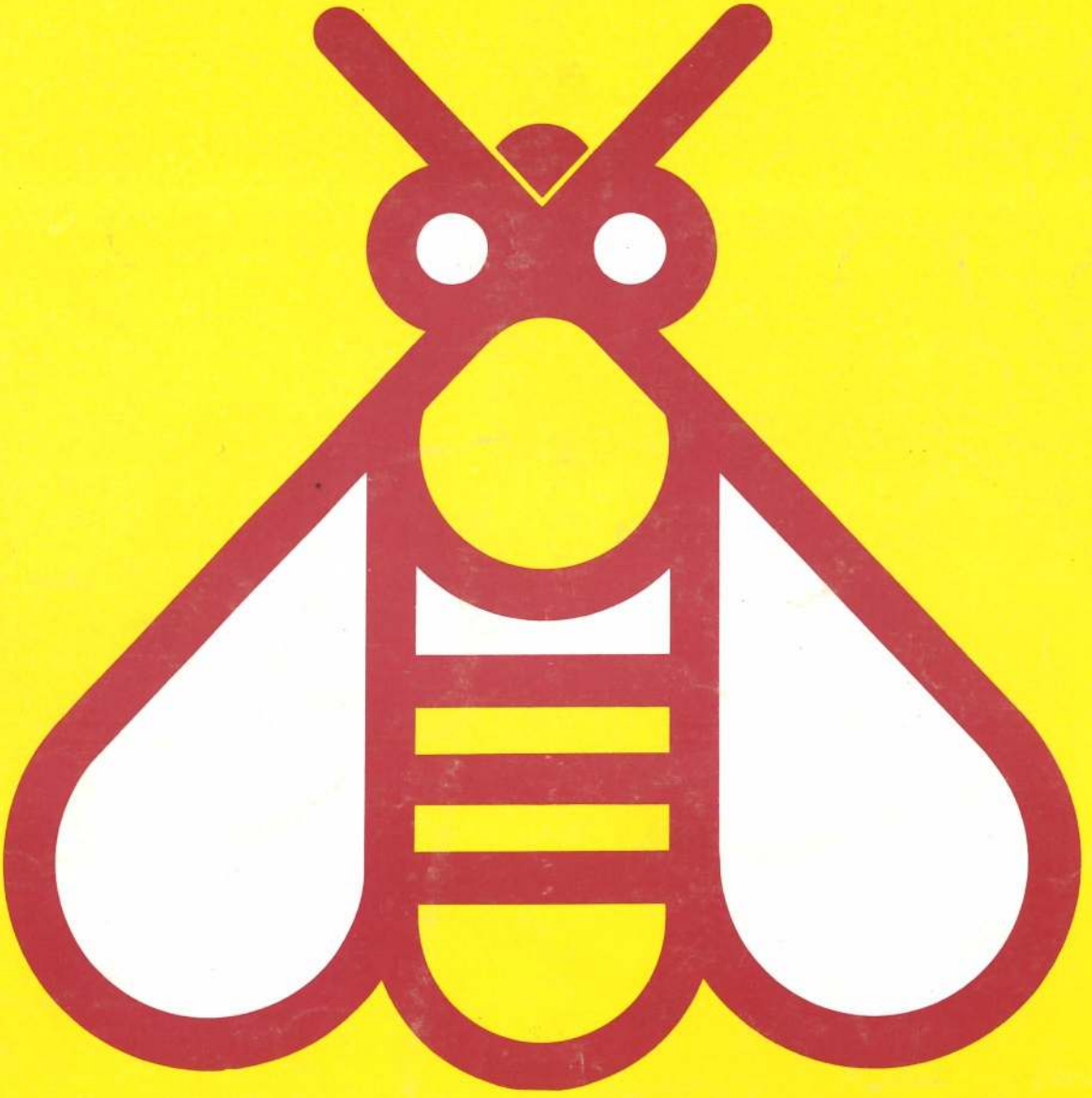
N WALLINGFORD
— PLEASE RETURN —

# THE NEW ZEALAND beekeeper



JUNE 1983

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Postal Address.....

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Signature.....

4153

ISSN 0110 – 6325

# THE NEW ZEALAND BEEKEEPER

Registered for transmission by post as a magazine.

June 1983
No. 178

## INDEX

**King Bee**
– *where the NBA has its sting* 3

**Conference registration** 5

**Crisis management**
– *easing financial pain* 7

**Labour relations**
– *$9500 back wages bill* 8
– *don't knock the union man* 8

**Bee education**
– *NBA BOP tutor* 9

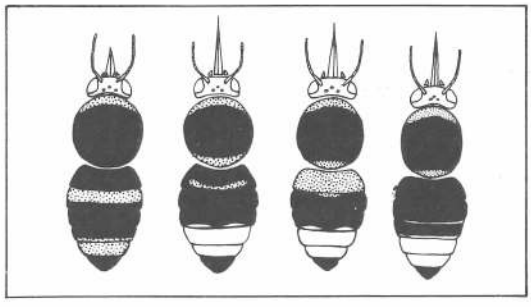
**Marketing**
– *bar coding here to stay* 10
– *DSIR pollen study complete* 23
– *private pollen samples needed* 23

**Queen prices**
– *talking prices upward* 10

**Being sociable**
– *Waikato field day* 11

**Pesticides**
– *pollination services at risk* 12

**Kiwifruit pollination**
– *Cam Jay helps out* 13



– *bumblebee brigade* 14

**Comment**
– *bumble bees no threat* 15

**Burrcomb**
– *from the editor* 17

**Beebookkeeping**
– *who is keeping who?* 18

**From the colonies** 19

**Correspondents** 22

**Book review**

– *apiculture in tropical climes* 23

**Winter feeding**
– *feeding dry raw sugar* 25

**What's new?**
– *an automatic de-boxer* 26

**Bee forage**
– *bee tucker for the taking* 27

**Bee colour**
– *golden bees, golden tempers* 28

**Beekeeping for beginners**
– *diet and efficiency* 29
– *feeding liquid honey* 31
– *readers queries* 31

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**Editor:**
Trevor Walton, Ph 81 193, Masterton. P.O. Box 594, Assistant editor: Angela Walton.

**Advertising Manager:**
Alison Woolley, Ph 81 193, Masterton, P.O. Box 594, Masterton.

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Mrs Jean James, NBA, P.O. Box 4048, Wellington.

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# NATIONAL BEEKEEPERS' ASSOCIATION

OF N.Z. INCORPORATED

**President:**
Tony Clissold, No. 5 R.D., Gore
Phone 866, Willowbank.

**Vice-President:**
Michael Stuckey, P.O. Box 35233, Browns Bay Auckland.
Phone 4781-284 (home)
4781-133 (business).

**Executive:**
S.J. Lyttle, No.2 R.D., Geraldine. Phone 1189.

M.C. Cloake, Fairview R.D., Timaru. Phone 80-723.

Ian Berry, P.O. Box 16, Havelock North. Phone 775-400 and 777-300 (business) and 778-772 (home).

A.D. Lorimer, 353 Cobham Drive, Hillcrest, Hamilton.

**General Secretary:**
Steuart Goodman, Dalmuir House, The Terrace, P.O. Box 4048, Wellington. Phone 728-102.

**Hon. Librarian:**
M.J. Heineman, Box 112, Milton, Otago. Phone 4613 (home)
4614 (business).

## BRANCHES

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President: Mr A.D. Booth, Drummond R.D. 8, Invercargill. Secretary: Mr R.A. Ward, 10 Beattie Street, Gore.

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(per insertion)

**Full page $255 (4 insertions $205), Half page $130 (4 insertions $105), Quarter page $70 (4 insertions $65), 1/8 page $40. Special locations $30 extra. Spot colour $80 extra.**

**Production charges**
Advertisements should be provided in a camera-ready form or as photolitho negatives. Where copy has to be typeset, or where film work or bromides are required, these will be charged to the advertiser on a time and cost basis. Minimum charge $10.

**Beekeeper rates**
Registered beekeepers selling queen bees, used hives, used plant and other used apiary equipment are eligible for an advertising discount of 20 per cent of the appropriate commercial rate. Where the appropriate rate is in doubt, the editor's decision will be final.

Production charges only apply to single insertion beekeeper advertisements or where special artwork, filmwork or bromides are required.

**Classifieds**
Available only to registered beekeepers selling used hives, used plant and other used apiary equipment, and those seeking work in the industry. $5 a column cm. No discounts apply. No production charge. Maximum size: 1/6 page.

## SUBSCRIPTIONS

**Commercial beekeepers:** The NZ Beekeeper is distributed free-of-charge to beekeepers with 50 or more hives, subject to payment of hive levy.

**Others:** Beekeepers with fewer than 50 hives and other subscribers: $12.50 a year. This includes (for New Zealand subscribers only) membership of National Beekeepers Association of New Zealand (Inc).

KING BEE
(WHERE THE NBA HAS ITS STING)

## Hive levy policing

The NBA executive is taking its first steps to tighten up on hive levy payments, following reports of certain larger beekeepers understating their hive returns to the Ministry of Agriculture each year.

## Wallingford congratulated

Nick Wallingford, a longtime NBA member, has been congratulated by the NBA executive for his appointment as beekeeping tutor at the Bay of Plenty Community College. The association has also agreed to donate copies of "Bees and Honey" to the college in the hope that they will be useful.

Mr Wallingford will attend the NBA conference in Nelson and it is hoped that he will meet with the NBA educational committee at that time.

## Gift for Cam Jay

The visiting North American pollination expert, Professor Cameron Jay, has now left New Zealand after contributing his considerable expertise to solving the pollination problems of the kiwifruit industry. It is hoped that an article on his findings will appear in a later issue of The NZ Beekeeper.

A gift for Professor Jay has been bought by the NBA.

## There's still an HMA

Long after we told the world that the HMA had been interred, it lingers on. According to David Kay, the Wellington accountant appointed to wind-up the affairs of the HMA, its existence is required for as long as it takes to dot all the 'i's and cross all the 't's in the trust deeds. There is no way the HMA can be wound up until the trust is alive and functioning – a legal entity to which funds can be directed.

To date, red tape in the path of the trust's conception has been created by the Inland Revenue Department, MAF, the National Archives and Treasury. But in the meantime, the trust's funds have been invested at 13 per cent at call.

## Book library to become tape library?

The NBA has asked NBA Technical Librarian John Heineman if he would like to expand the existing library service to include audio cassettes and movie films.

There was a proposal to establish an audio cassette library in Timaru a few years ago but, other than the establishment of a bank account, there was little progress.

To carry the tape idea further, NBA executive members Cloake and Lyttle are to now approach Radio NZ to determine what beekeeping material might already be available on audio cassettes. If suitable material is available, the cassette library will have the chance to get underway at last.

## NZ Beekeeper

At its March meeting the NBA executive approved an increase in The NZ Beekeeper editorial fee for the September and December issues to cover escalating costs in the period since the editorial contract was negotiated (December 1981).

Since then, however, the government has notified a minimum 6-month extension to the freeze and the fee increase will not now apply.

## Stuckey and Lyttle retire

NBA vice-president Mike Stuckey and executive member Steve Lyttle have decided to retire from industry politics after several years service to the NBA. Neither will be available for re-election in the 1983 poll.

## Beautiful NZ campaign

What campaign? You may well ask. Announced in the run-up to the 1982 General Election, the Beautiful NZ roadside tree planting programme has yet to get underway.

The NBA executive, however, is concerned that progress might be imminent and has asked to be kept fully informed about proposals and projects, so that beekeeper interests are kept in front of the committee.

## Apimondia 1984

The 29th Congress of Apimondia is being held in Hungary from August 25 to 31, 1984. Details are available from NBA branch secretaries.

## Hostile bees

A greater density of bees in urban and semi-rural areas is thought to be behind an Accident Compensation Commission query as to whether bees are becoming more vicious and their stings more toxic. A claim along these lines was made at a recent meeting of the ACC's rural safety committee by the Vegfed Christchurch representative. And as a result the ACC is seeking further information from the NBA.

For its part, the NBA executive is forwarding the query to MAF scientist Pat Clinch, just in case there is some substance to it.

## IBRA information

The International Bee Research Association has published a series of ten leaflets on Source Materials for Apiculture (SAM), which provide information often needed and sought by beekeepers worldwide. A description list can be obtained from The NZ Beekeeper, P.O. Box 594, Masterton; the leaflets can be purchased from IBRA, see below.

The International Bee Research Association has now released the reprint of an article from no. 4, 1982, Bee World, in which Dr L. Bailey describes his recent researches at Rothamsted Experimental Station that have led to the discovery and identification of 18 viruses in honeybees. These viruses are associated with various symptoms of ill health in bees that have been attributed in the past to other bee diseases. Some of the viruses occur in close association with well known diseases such as nosema. The viruses are endemic, and the best chance of control is by appropriate management practices, which are outlined.

The reprint (M111) is available direct from the International Bee Research Association, Hill House, Gerrards Cross, Bucks SL9 ONR, UK, price 95p or US$2.30, post paid.

# Telford Farm Training Institute

TELFORD

**EXPANDING INTO COMMERCIAL BEEKEEPING**

**September 5 – 8**
Monday, 1 p.m. to Thursday, 12 noon.

For beekeepers seriously in the business, who are about to expand into full-time production. Coverage of all aspects of commercial bee-keeping, planning, decision-making, hive equipment, business management, economics and marketing.

*For further information please contact:–*

**Course Supervisor,**
**Telford Farm Training Institute**
**Private Bag, Balclutha**
**Telephone 81 550, Balclutha**

# North Islanders' Mainland Tour

**Friday July 29.** Bus departs Nelson. P. Cropp, Motupiko, pollen processing. Westport, Coaltown. Punakaiki, Pancake Rocks and new visitors centre. Night in Greymouth.

**Saturday, July 30.** Honey house visits to R. Glasson, Taylorville, J. Glasson, Blackball. R. Buchanan, Paroa. Also Shantytown and/or Timbertown.

**Sunday, July 31.** Travel to Canterbury. Honeydew beekeeping T. Cattermole, Oxford. S. Bozi, Rangiora. Stop in at Havill's Mead on the way to Christchurch. Night in Christchurch.

**Monday, August 1.** Honey Packing Plants Christchurch area Airborne Honey Ltd, Leestone. NZ Honey co-op Hornby. Optional halfday free time, e.g. shopping, sightseeing.

**Tuesday, August 2.** Travel to Picton. Honey shop Greta Valley, I. Hislops at Kaikoura, Grassmere salt works, Montana winery, Bush's honey house, Blenheim. Arrive in Picton for 8 p.m. sailing of ferries.

**Cost per person $185, includes dinner, bed and breakfast.**

**10% deposit with booking to P.O. Box 879, Nelson, by June 30, 1983. Balance to be paid with Conference Registration.**

# 1983 MAF Seminar at Nelson

Rutherford Hotel
July 26, 1983

**Registration 8.30 a.m. to 9.15 a.m.**

**Seminar themes:**
**Pollination and Biological Control**

Hear expert speakers from MAF, DSIR and the industry talk about pollination of pasture legumes and kiwifruit, the use of pollen supplements and processing and marketing pollen. There will also be an interesting and no-doubt controversial session on biological control programmes being undertaken by the insect and weed groups of DSIR. Hear about their research to control wasps, nodding thistle, gorse, Californian thistle and broom.

# Conference reminder

**Photographic competition**

In three categories:–

A. Humour
B. Bees and flowers
C. Beekeeping activities

Minimum size 9" x 7". Photographs are to be sent to P.O. Box 879, Nelson, by June 30, 1983.

Honeymead competition – to be judged by popular acclaim at the final evening social. Entries to be brought with those coming to Nelson. If unable to attend conference post entries to:–

**P.O. Box 879, Nelson.**

# NATIONAL BEEKEEPERS ASSOCIATION

# CONFERENCE AND SEMINAR

## 26 - 27 - 28 JULY 1983

## NELSON

VENUE: Rutherford Hotel

We look forward to welcoming you to Nelson for the 1983 Conference and know that you will have an enjoyable stay with us. Please complete this registration form in full, and return together with the required fees and information to:

NELSON CONVENTION BUREAU,
P.O. BOX 194,
NELSON

as soon as possible and no later than 30th June 1983

NAME MR/MRS/MISS.....

CHRISTIAN NAME.....

ADDRESS..... PHONE.....

.....

1. Do you require accommodation ? ☐ YES ☐ NO

2. Are you bringing a partner ? ☐ YES ☐ NO NAME.....

3. ACCOMMODATION: A range of accommodation is available. Please tick your preference. Every effort will be made to fulfil your request. As these rates reflect several establishments, they are only approximate and as at 1st May 1983

| | | *Twin Rate | Single | |
|---|---|---|---|---|
| a. | Rutherford Hotel | 55.00 | 48.00 | ☐ |
| b. | Leisure Lodge | 42.00 | 36.00 | ☐ |
| c. | Carmel Court - 2 Bedroom units (2 couples $51.00 | | | ☐ |
| d. | Hotel Nelson | 25.00 | 20.00 | ☐ |

PLEASE INDICATE PREFERENCE BY TICKING IN THE APPROPRIATE BOX

4. Nights for which accommodation is required :

| TUES | WED | THUR | FRI | SAT | SUN | MON |
|---|---|---|---|---|---|---|
| 26 | 27 | 28 | 29 | 30 | | |
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

(Please tick the evenings for which accommodation is required.)

5. TRANSPORT:

I will be arriving by my own means ☐ YES ☐ NO

I require transport on arrival ☐ YES ☐ NO

I require transport on departure ☐ YES ☐ NO

I will be arriving by AIR NZ FLIGHT..... ETA.....

I will be arriving by NEWMANS..... OTHER.....ETA.....

Departing by (specify)..... DATE.....ETD.....

6. I would like the following facilities to be made available eg.. Cot, Babysitting. Please state:

.....

7. Do you wish to attend the Cabaret @ $27.00 per person ☐ YES ☐ NO .....

8. FEES: Please enclose an accommodation deposit of $20.00 per person .....

Conference Registration @ $20.00 per person .....

PLEASE FORWARD YOUR CHEQUE TO : NELSON CONVENTION BUREAU, BOX 194, NELSON $==========

*** FINAL REGISTRATION DATE IS 30th JUNE 1983 - NO REGISTRATIONS CAN BE ACCEPTED AFTER THIS DATE.

* * SPECIAL NOTE * *

CABARET & DINNER :
Includes ,4 Course Dinner, All liquor, Entertainment and Transport to and from the function.

REGISTRATION FEE :

Includes morning and afternoon teas, all venue Hire, printing, and Conference Fees!

N.B.
Lunches and Evening Meals other than the Cabaret are at delegates own expense.

# Co-operative initiatives ease financial pain

**by Trevor Walton**

CO-OPERATION BY the Rural Bank, the NZ Sugar Company and among beekeepers themselves is easing the burden faced by beekeepers following a disastrous season in Otago and Southland.

Many Southland and Otago beekeepers who applied to the Rural Bank for finance as a result of a bad 1982/83 honey season, have been granted special assistance. Other beekeepers are still waiting to have their applications processed.

According to the Invercargill manager of the Rural Bank, Mr P.D. Skelt, beekeepers who have waited a few weeks for acceptance of their applications should not worry about the outcome. He said holidays, conferences and now renovations had disrupted office routines considerably over the last month or two and some delays might have resulted.

"All our work is against a time constraint," he said. "But we have tried to give a time priority to beekeepers because we know how difficult their position is, buying sugar and so on."

Mr Skelt said that most applicants for assistance in Southland were reasonably substantial operators who had previously borrowed from the bank. Because of their assets, he said, most had plenty of personal equity against which additional advances could be secured. Only in two or three cases were advances secured against hives.

For existing bank borrowers, the most significant help the bank could give beekeepers, was a one-year deferment of their loan servicing obligations. In many cases, this was the only assistance sought, he said.

While the bank usually referred applications for financial assistance to the local apicultural adviser, this was not always the case, said Mr Skelt. Most beekeepers seeking assistance had done so on their own behalf this time and there had been no problems as a result.

One beekeeper, said Mr Skelt, had gone to the top and asked the minister of agriculture to intervene on his behalf. But it was a case where an approach had not been made to the bank first and the intervention had been unnecessary.

Mr Skelt said that the bank should not be seen as a bunch of ogres. Beekeepers, he said, should feel free to call in or phone to discuss their needs – "we're fully aware of their situation and we've been directed to help in any way we can".

Tony Clissold, owner of Glass Brothers Apiaries near Willowbank, and president of the National Beekeepers Association, said that the local MAF adviser, Cliff van Eaton, had been marvellous in helping beekeepers cope with the effects of a low or nil-income year.

Beekeepers in Southland were co-operating and pooling ideas, he said. "In many cases, the main benefit has been in sharing problems with others in the same situation. But we've also had some interesting suggestions made, like wintering down three hives in one in the hope that they'll need less tucker."

### Cheaper sugar feed

The Honey Producers Co-operative, through its Auckland-based consultant Warren Hutchinson, is co-operating with the NZ Sugar Company to see whether it is possible to buy sugar products for bee feeding which are more suitable and economic than the 35 kg bags of white refined table sugar which is normally used for this purpose.

The first step in this exercise has been feeding trials which are being carried out in South Canterbury by well-known apiarist Harry Cloake. The trials are focusing on the suitability of two forms of liquid sugar, commonly used for brewing and for the preparation of cough syrups.

According to Mr Derek Barker, the sugar company's sales manager, these liquid sugars are "intermediate process syrups which have not gone through all the refining process. They are variable in colour and other parameters and are not produced to a microbial standard. The trials are being carried out to determine whether these quality aspects are important."

In the past there has been a preference for raw sugar from beekeepers who feed dry sugar to their bees. This is because the hygroscopic properties of raw sugar (it draws moisture from the air) make it easier for bees to digest.

However, the grade of raw sugar marketed for human consumption in New Zealand is more expensive than white sugar because of special costs associated with manufacture, packaging and shipping in relatively small volumes. For this reason the most commonly used bee feed is white sugar fed as a liquid.

The liquid sugars being investigated by the Honey Producers Co-op are normally transported by 9000-litre tankers. If they prove to be suitable, the focus of the investigation will then fall on the economics of feeding them, with transport costs taken into account.

Because white sugar is normally fed as a liquid, the liquid sugar will have the advantage to beekeepers that it won't need to be reconstituted – a time-consuming process. However, the water contained in liquid sugar will add to the transport costs of the product and will erode some of the factory gate price advantages.

Mr Barker says his company is pleased to be helping with the quality and transport aspects of the trials. "We're hopeful that a successful outcome will enable distribution to start soon," he says.

The co-op's initiative in organising the trials will undoubtedly benefit the entire industry. The NBA executive recognised this at its last meeting and members were pleased to note the extent to which the sugar company was helping.

Nevertheless, those beekeepers with a disastrous season behind them and faced with feeding hives this spring, will need to have a clearcut answer well before August, when the main feeding operations begin.

## One hive levy deferral

ONLY ONE beekeeper with a bad-season financial problem approached the NBA to wipe his hive levy.

The NBA executive decided it didn't have the power to wipe a beekeeper's obligations to pay the levy, but that it could allow a deferral.

In this case, the obligation to pay was deferred from February 20 to May 31. After that, the normal 10 per cent penalty for non-payment would apply.

# $9500 bill for back wages

BEEKEEPERS IN the Northern Industrial District missed a beat in January 1981. At that time the Auckland food processing union amalgamated with its southern North Island and northern South Island counterparts and negotiated a new award covering staff of food packing houses.

Until then, honey packing had not been included in the northern award. The inclusion came with the new award and since no Auckland packers were represented at the conciliation council, any wish they may have had to argue for an exclusion for their operations was missed.

The Northern, Taranaki, Wellington, Marlborough, Nelson and Canterbury Foodstuffs and with the exception of the Northern Industrial District Chemical Products Employees Award has now been in operation since April 24, 1981. It binds all employers and employees involved in the packing of honey, other than those in the Otago and Southland Industrial Districts.

Peter Nash, secretary of the NZ Food Processors and Chemical Workers Union recently contacted the NZ Beekeeper. He says that he is concerned that a large number of beekeepers are apparently unaware that the award applies to their honey packing staff.

"We recently had a case where we discovered a honey packer had been underpaying his three workers by more than $1 an hour. He had been giving them all the cost of living increases, so he wasn't ripping them off or anything, but he wasn't paying them the amount to which they were entitled.

"He owed them about $9500 in back wages – something his firm couldn't afford. So he's now paying it off at a rate of so much a month.

"Our union's not communist dominated – we're not one of the big stick outfits – and I think you'll find we have a good reputation for moderation and commonsense. But we have a responsibility to make sure that workers covered by our award are getting the pay and conditions to which they are entitled."

He also pointed out that any employer who underpaid his staff would be liable to Labour Department action if an employee laid a complaint at some time in the future.

Mr Nash said he wasn't interested in husband and wife outfits. But where a business expanded to include the neighbour's wife or daughter, there was the risk of the beekeeper being out-of-touch with award rates and conditions.

Most beekeepers did not belong to the local Employers Association and for this reason are not aware of award changes. Because of this, Mr Nash posts copies of the award to all honey packing houses he knows of, whenever there is a change.

"I've recently had a difficult case, where a beekeeper really got his tits in a tangle when I called, but most of them are quite reasonable.

"When I do my rounds, I'm not out to drum up union membership. If a worker is spending more than half his time on apiary – as distinct from packing work – there's no question of insisting on membership of the union, but they do have to be paid at the Food Processors Award rate when they're doing work which is covered by that award."

In 1981, when the issue of union membership for honey packhouse workers first came to the fore, the NBA sent out a circular to hive levy payers which advised that beekeepers were obliged to pay appropriate award rates whether or not their employees became members of the NZ Food Processors and Chemical Workers Union. This is still the case.

# Don't knock the union man

BEEKEEPERS who have had dealings with the NZ Food Processors and Chemical Workers Union should endeavour to co-operate with the union representative, if he calls at their premises. He is entitled, under the award, to speak to staff and to enquire as to wages and conditions.

The union has a record for being reasonable in its dealings with beekeepers: Where cases of underpayment of wages have been detected, the employer has been allowed to use a time payment system to pay arrears. Where workers spend less than half their time on honey packing work, there has been no pressure placed on staff to become union members.

A reasonable attitude on one side of the industrial fence is most likely to result in a similar attitude on the other. Also, the union representative is fully involved in industrial matters every day and his advice in respect to legal obligations is likely to be correct.

Where beekeepers doubt the union's interpretation of an award matter, local offices of the Labour Department provide an award advice service. Better still, the Employers Association provide a legal advice service which is geared to the employer's needs . . . however, membership of the local association is necessary to make use of this service.

In February 1981, the editor of the NZ Beekeeper suggested to the NBA executive that the NBA should seek membership of the Employers Federation. While the suggestion was not acted upon at the time, the recent $9500 arrears case would seem to be sufficient justification.

An alternative step would be for the NBA to constitute itself as an employers' union, ensuring full representation at future award rounds.

## LIBRARY NEWS

We have purchased INSTRUMENTAL INSEMINATION OF HONEY BEE QUEENS by Harry H. Laidlaw Jr. Printed 1977, 144 pages with text and numerous B/W photos. Very clear. A must for anyone embarking on this technique and very interesting for those who want to understand more about AI.

Mr Nick Wallingford presented the library with a copy of BEES AND MANKIND, by John B. Free. 155 p.p. 1982. A very nice donation indeed. Thank you very much Nick. A full review of the book was given in the March issue of The NZ Beekeeper, page 24.

Would borrowers, when returning books, please make very sure of secure parcelling. Use a couple of layers of strong paper and some string.

Lending library books to third persons is a bad practice. The library is done out of a loan fee and you are responsible for loss. Replacement can be very difficult and costly. Loss of books has occurred three times now since I have been in charge of the library and every time because of passing on. We are still waiting for one replacement now; it will cost the culprit probably some $15 or there abouts.

**John Heineman**
**P.O. Box 112**
**Milton**

# NBA member appointed BOP bee tutor

FOR SEVERAL years now, the National Beekeepers' Association has been wanting to set up some form of educational and training system for the beekeeping industry. With the appointment of a tutor at the Bay of Plenty Community College in Tauranga the goal is that much closer to fruition.

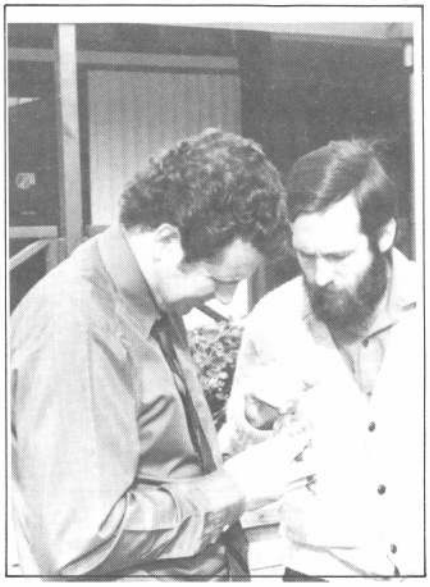
The college has run classes for hobbyists for several years, taught by former apicultural adviser, Doug Briscoe. The response to them was immediate and sustained. The 12 week course covered all topics relating to starting with bees, their management and responsibilities under the Apiaries Act.

Principal Kevin Hearle and Barry Mead, head of department for technical studies, saw the success of the hobbyist courses and realised the great need for educational courses, both for beekeepers and for information about beekeeping for horticulturists who hire bees for pollination. With hive numbers in the Bay of Plenty expanding at such a rapid rate (20 per cent last year) to meet horticultural pollination requirements, the Bay of Plenty Community College is ideally sited to provide this education as well as making the materials available to other parts of the country.

"Our next step was to contact the industry to understand what they saw as their needs," according to Mr Mead. "We met with both the executive of the NBA and with their educational sub-committee and let them know what we could offer. I went into the possibilities with them at the NBA Conference last year and then again in Wellington at meetings attended by both MAF and the Department of Education."

After advertising the position and interviewing applicants, the actual appointment was made in February to Nick Wallingford. Mr Wallingford an NBA member, has been involved with the beekeeping industry for nine years and has worked for several commercial beekeepers around the country, as well as keeping 75 hives of his own around Rotorua for the last four years. He has been involved in the local hobbyists' club and written a number of articles for bee magazines.

"I'm quite excited by the prospects of this position. There hasn't been much in the way of educational opportunities in beekeeping in New Zealand so far. As far as letting growers and the general public know the real value of our industry, we as beekeepers have tended to be very low key. I feel it is time we did a bit more toward informing them not only about the virtues of honey and other hive products, but also the essential pollination services that bees provide to agriculture and horticulture in general."



*Kevin Hearle, principal, Bay of Plenty Community College and newly appointed beekeeping tutor, Nick Wallingford, taste a pollen sample.*

Mr Wallingford went on to say that there is a great demand from commercial beekeepers and their employees and from the part-time beekeeper, those with 50 to 250 hives, for short courses on specific topics as well as some sort of certification course.

"The Diploma in Apiculture has been around for about 20 years, but has never really caught on with beekeepers as they feel it too academic in approach, and students were left too much out on their own in studying for the exams. I have completed all but the thesis for the diploma and I have thoroughly enjoyed the reading and the examinations; I agree that most students need more than just a syllabus and reading list to get the most out of such a course. That is one area that needs a lot of work with any programme, providing the student with relevant, up-to-date materials on current practice and research.

"My job will be to develop materials for use with beekeepers and to write material that can be used in a variety of other classes as well. The Horticulture and Agriculture Cadet Schemes, for instance, cover such topics as pollination and pesticides, and at present there is no real input from the beekeeping industry to them. I want to make sure that beekeeping is presented to these people in as accurate a manner as possible, that they become aware of the needs of bees and beekeepers so that as the growers of the future they will be better able to appreciate our concerns as beekeepers."

Mr Wallingford is, at present, working at producing a package of information and an outline of study for beginners who have no other way to learn about beekeeping but through books. "With more than 400 hobbyists taking up bees last year, many of those in areas far from Community College courses or clubs, it is very important to the whole industry that they have some organised way of learning the basics of good beekeeping.

"I do not see my job as encouraging hobbyist beekeeping but rather acknowledging that there are a tremendous number of new hobbyists, and trying to get them started on the right foot. Beekeeping is a fine hobby, and many commercial beekeepers got their start that way, but it must be done with a sense of responsibility. I feel that proper education is the way to get that across to them."

And what of future programmes from the Bay of Plenty Community College?

"We have a number of ideas to work on already. We will be running two short courses in conjunction with MAF early this next season, one on queenrearing and one on pollination. Both of these have particular relevance here in the Bay of Plenty. We are also putting on a one day short course for non-beekeepers, trying to reach teachers, growers and consumers to answer those questions about bees, beekeeping and honey that everyone has. I'll have an observation hive to show them, a honey tasting session, and will work to raise the general awareness of bees and their importance to us all.

"As far as any certification-type course, we will be getting together with all the interested parties at the Nelson NBA Conference to discuss the format and content. I don't want to pour it all out at once but rather get the acceptance and backing of the industry for the things we want to achieve. That is, after all, what the whole appointment is about – developing educational materials and courses to benefit the whole of the beekeeping industry."

# Bar-coding is here to stay

**by Ian Berry**

THE RECENT introduction of the scanning computerised checkout system at supermarkets in Taradale, Hastings and Auckland will be of interest to honey packers. As the number of grocery outlets using this system increases, so will the pressure increase on honey packers to have their retail packs bar-coded.

The technology involved in the system is interesting and it will no doubt be a marked advance in the distribution of groceries and other lines from both the retailers and the customers point of view. Unfortunately, the main interest, from a honey packer's point of view, is the extra costs that are necessary to get the bar-coding on the honey packs. These extra expenses will not be recoverable while the price freeze remains.

The first thing a honey packer would need to do if he wishes to have his product bar-coded, is to contact The New Zealand Product Number Association Ltd, P.O. Box 11-110, Wellington. Information and application forms will be forwarded to the packer and, provided the application is accepted and the entry fee ($200) plus the annual subscription (another $200) is paid, all the necessary information will be sent from the Association and a product number will be allocated.


The financial year for the Association runs from September 1 to August 31 and there are no part subscriptions for part financial years. Don't get caught like we did – we paid our joining fee and annual subscription on April 14, 1982 assuming we had paid a 12 months subscription only to find we were due to pay a further $200 on September 1, 1982.

The next expense is getting the bar-coding onto the honey containers. The cheapest method of doing this is to incorporate the bar-coding in the printing on the honey container or label. The cost of this is quite considerable. However, it eliminates the need for any additional expenditure.

Our carton supplier charged us $2016 for the supply of artwork amendments and plates for the seven different honey cartons we pack. For smaller lines small stick-on bar-coded labels can be used. Prices quoted from one source are: 5000 labels – $121, 10 000 – $163 and 20 000 – $255 with preparation costs of $68 per number. 2 kg plastic containers can be printed on the lid at five cents per lid.

Because of the costs of setting up the scanning system in the retail outlets, only the large stores are able to afford to change to the new system, so there should always be some outlets which will not require their honey packs bar-coded. However, for those honey packers who need volume outlets both in New Zealand and overseas, there seems little doubt that bar-coding on all retail packs will become necessary in the not too distant future.



# Talking prices upward

THE PRICE of queens will rise for the coming season after the lifting of the price freeze but most breeders' prices will still be below the guideline agreed upon by the Queen Breeders' Association last year as reported in the September 1982 NZ Beekeeper. The intention to more closely relate a queen's price to that of the wholesale price of 4.5 kg (10 lb) honey is an old relationship revived to help breeders in setting fair prices.

According to Mr M.D. Haines, prices overseas still exceed those of New Zealand, with queens costing about $US6 ($NZ9 to NZ$12).

"We also have the situation of a very high demand for spring queens which means a lot of our equipment might sit idle for the rest of the year."

He felt that evening out this demand by promoting the use of late summer and early autumn queens would in the long term work to the advantage of all.

"We have orders for spring queens, and late autumn queens can go onto the export market, but if we could get beekeepers used to using the queens from the January to March period we'd get more reliable supply. Queens reared in this time are high quality as there is plenty of pollen and nectar available to the cell builders and nucs. With the weather more settled than in the spring we have less trouble keeping to schedules and the matings must be better as well."

Mr Haines added that much of the pressure for spring queens was coming because of the increase in hive numbers to be used for pollination. He added that another aspect of the price increase is the cost of selective breeding programmes which must come out of income as well as all the costs of production.

"Our prospects look good especially in terms of bee health. Since New Zealand is free of Varroa and European Brood Disease we have a good export potential, but looking back over the history of queen breeders around the country – it has not always been an easy way to make a living. This linking the queen's price to the value of two frames of honey is a good clear image for most beekeepers to understand. A good young queen in a hive will make management so much easier and as far as earning her value, a young queen should increase honey a lot more than that two frames worth that she cost. I think it's one of the best investments around."

# Big turnout for Waikato field day

THE ANNUAL field day of the Waikato branch of the National Beekeepers Association was held at Arataki Honey Ltd at Waiotapu, 17 miles south of Rotorua on Saturday, March 5.

The fine warm day no doubt helped bring the large crowd of some 250 people, many of whom had travelled from distant parts of the North Island. The south of the South Island was represented by Mr Keith Herron who gave the crowd a taste of his special brand of humour.

There was something of interest for everyone, with talks and demonstrations on a wide range of subjects including packaging and packing of comb honey, extracting, many aspects of sugar feeding both as syrup and dry, and a demonstration of the loading of hives with a boom loader in competition with a team of two loading by hand.

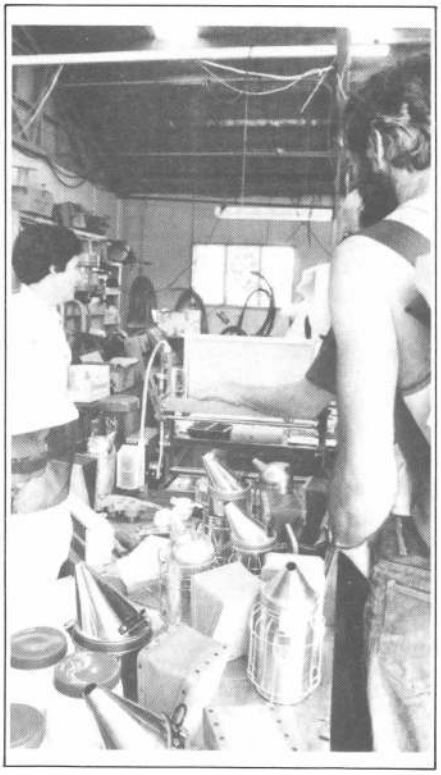
Both Ceracell and Taupo Honey Centre had trade displays which attracted a lot of interest. There was also a display of eight new trucks to give beekeepers something to dream about when we get that bumper crop next year.

There were several competitions including the antique honey containers, a cooking competition, which attracted many delectable entries (of which one was awarded a special consolation prize because it somehow got eaten before judging time), humorous drawings and homemade beeswax ornaments.

The competition for naming the floral source of 17 different samples of honey produced a rather surprising result, with the winner having a total of only three correct. This result was, hopefully, due to the fact that there was so much of interest to see, that very few got around to entering the competition, rather than an indication of a lack of knowledge of our product by beekeepers.

A lolly scramble was provided for the children and a team of ladies organised morning and afternoon teas, as well as a pooled lunch complete with barbecue sausages at the house. For quite a number of us, dinner in Taupo followed by a swim in the hot baths finished off a memorable day.

Special thanks to the ladies, Annette and Russell, and the Waiotapu staff of Arataki Honey for turning on such an enjoyable and instructive field day.



**Photos from top clockwise:** *Joanne Platt and Margaret Smith cutting and packing comb honey; a display of smokers by Ceracell and rubber gloves protect a worker pouring wax into moulds.*

# Slipshod pesticide practices put pollination services at risk

**by Trevor Bryant, apiculture adviser, Tauranga.**

POISONOUS SPRAYS have probably cost beekeepers in the Bay of Plenty more than $160 000 over the past year: 750 hives have been reported to MAF as being severely affected by chemicals, but it is estimated that three times this number have suffered from the effects of poisonous sprays.

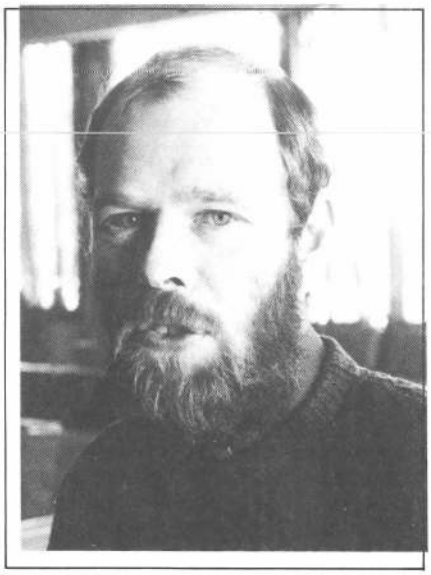
Generally, only hives where it is possible to obtain a sample are reported to the Ministry, but these additional cases are nevertheless made known to MAF advisers. Such cases usually occur between visits by the beekeeper, and samples are either too decomposed for analysis to be made or the dead bees are no longer available.

The loss of production is estimated from known cases at $5500, loss of pollination fees at $36 000, and loss of bees at $18 750 with the cost of time, labour and travelling in excess of $3000. This gives a loss from reported cases of $63 250, which could be more than tripled to cover all those unconfirmed cases, but the greatest loss is the additional cost of development which is estimated to be in the vicinity of $20 000.

The main contributing factors associated with these losses are mixed cropping and kiwifruit orchards, the spray drift to understorey in the orchards and the long citrus flowering season.

Azinphos methyl (Gusasthion) and carbaryl were the main problem chemicals. In all too many situations, growers failed to mow orchards to remove clover and other flowering cover crops prior to spraying. Pre-blossom sprays were applied too late, usually within seven days of the bees being moved into the orchards, and post-blossom sprays being put on before the bees were removed. In mixed orchards growers sprayed one crop while another was in bloom and bees were in adjacent orchards.

Last year in the Te Puke district where the map system was used to supervise the kiwifruit pollination season, bees were sited on 340 orchards. The first went in on November 17, 1982 and the last came out on December 17, 1982. Five growers sprayed late, one grower deliberately sprayed while knowing bees were in the next door orchard and 27 orchards failed to contact the map co-ordinator when the hives went into the orchards and did not contact him when the hives came out.



**Trevor Bryant**

On the other hand, five did not make contact when the hives were moving out, and five did not make contact at all, but other orchardists notified the co-ordinator of the movements on and off these orchards. A total of 134 orchardists made contact before applying insecticides.

In the Tauranga district 30 beekeepers used the pollination co-ordination service. The number of orchardists using the service rose from 134 in 1981 to 218 in 1982. The co-ordinator received about 20 calls a day with regards to spraying. There was only one case where bees being sprayed was known.

The Ministry of Agriculture and Fisheries forwarded 10 samples of dead bees to Wallaceville Research Station for diagnosis; seven samples were confirmed – three could not be confirmed because of advanced decomposition. A number of other samples were not sent as these were also too decomposed. The number of hives known to be totally lost between April 1982 and April 1983 was 450, the worst case of damage from either Gusathion or carbaryl occurring on December 6 in the Katikati district when a total of 250 hives were affected. In March/April more than 300 hives were affected and this damage has been a recurring problem during these months over the past four years and would appear to occur through the application of autumn clean-up sprays.

In the Gisborne region beekeepers have been forced to remove hives from the fertile plains areas where this continuing damage has made the wintering of bees impossible. This has occurred in the Bay of Plenty but to a lesser extent. However, the greatest impact from the effects of toxic sprays is felt by those beekeepers trying to expand their operations to meet their future pollination commitments. Rather than expand beekeepers faced with the continual loss of bees have problems maintaining their existing hives without even considering expansion.

# YES! WE'RE IN

The National Beekeepers Association IS represented on the Pesticides Board despite being glaringly absent in the list of representatives – see Ian Berry's article 'New law for Agricultural Chemicals', NZ Beekeeper March 1983. Readers will be pleased to know that the omission was a production oversight and not an error of fact.

Sorry Ian, the editor goofed.

# Canadian researcher answers many questions and asks many more

**by Murray Reid, apiculture adviser, Hamilton.**

IMAGINE YOU are a bee, a honey bee that is, and you are foraging in a kiwifruit orchard. It's difficult working kiwifruit flowers as they don't produce any nectar, only pollen. However, at last you have a load and its time to go home, so you head up above the canopy of vines and set off towards your hive. But wait a minute, which way is home? "I think I came along that line of matsudanas, or was it the one over there," you say.

"No, I think it was the first one, but which vine is my hive under, they all look the same from up here. Help I'm lost! "

Getting lost in a kiwifruit orchard is a very real problem for honey bees, just as it is for beekeepers bringing in hives after dark. The beekeepers usually blunder their way out but the poor old bees may never make it home. If too many suffer this fate the hive population dwindles, which means less flowers are pollinated and the beekeeper is likely to miss out on a honey crop too.

To help us understand and overcome some of these problems we enlisted the help of Dr Cameron Jay from the University of Manitoba in Canada. Dr Jay is the head of the Entomology Department at the university and is an expert on bee behaviour, orientation and pollination. He was also looking for somewhere to spend his seven month sabbatical leave.

And so the negotiations began. After a lot of effort by the apiary section of Advisory Services Division, the DSIR and the Kiwifruit Authority, who funded the research programme, Dr Jay, his wife Maureen and son Murray finally arrived in New Zealand last September.

The next two months were very full for the Jays. They had to move into a house, find some furniture, a car and a school for their son. Dr Jay had to settle on a research topic, make or borrow his experimental equipment, locate suitable orchards and arrange the beehives.

Phew! All this was bad enough but it would pale into insignificance over the next four weeks when the experiments were running. It was a real family effort. Cam Jay was ably assisted by his wife to record data; by his son when hives had to be shifted at night and by MAF advisers and field officers when large numbers of bee counts had to be made.

*Getting lost in an orchard is a real problem.*

Most days began at 6.00 a.m. for the Jays and bee counts on vines or pollen trap collections were made every two hours thereafter until 6.00 p.m. At night the day's data was assembled or hives were moved, or pollen loads were sorted. To give you some idea of the work load they undertook, Maureen sorted through 594 collections of pollen and graded them into plant types. Cam, and his assistants, counted and followed 675 bees (for over 31 hours) visiting kiwifruit flowers.

They watched over 379 bees make 3217 visits to flowers and recorded the behaviour of the bees on the flowers and made over 648 hive entrance counts. Any wonder they were exhausted at the end of the flowering season!

Well, what did Dr Jay find out? One of his main objects was to see if bees dispersed well throughout the orchard from hives put in a group (on a pallet for example), as they do from hives scattered throughout each block. I'm happy to report they did. So, growers if your beekeeper wants to bring in hives on a pallet don't worry. The bees will disperse evenly throughout your orchard.

The main foraging activity of the bees occurred between 10.00 a.m. and 4.00 p.m. The bees, as we would expect, preferred to work the warm sunny side of the vines ie. the east side in the mornings and the west side in the afternoons. Honey bees do not like dark places and foraging was restricted from colonies placed under vines. Dr Jay's recommendation is to locate hives in the warmest, sunniest place possible.

Kiwifruit flowers produce no nectar, as we know, but the bees seemed to find the pollen attractive. Two types of kiwifruit pollen can be readily distinguished in the pollen balls on the bees' legs. The pollen from male flowers is a cream colour while the pollen from female flowers is white.

Some bees only collected male pollen and others only female but an average of 25 per cent had both male and female pollen mixed. These ones would obviously be doing an excellent job of pollination. Most bees seemed to work six to eight female flowers before changing to a male. Each bee spent about 19 seconds on average on each flower. If flying time is included, each bee visited 190 flowers per hour. So in a "normal" day a foraging bee could be expected to visit about 1500 kiwifruit flowers.

Each female flower could be receptive for up to seven to eight days after opening, even when the petals start going brown and we know each mature female vine has around 1200 flowers. So, on this basis, only one bee per two female vines should be sufficient to give good pollination. However, bees have to visit male vines too so as a rule of thumb, one bee per vine could be regarded as a minimum. ▶

▶ The current MAF recommendation for a mature block is eight hives per hectare. Further analysis of Cam Jay's figures and more research work by the apiary section from Wallaceville may enable us to adjust this recommendation.

In the meantime we've opened a Pandora's box. A lot of questions remain unanswered. I asked Cam for a list before he left New Zealand last month. "Well," he said, "How many pages do you want me to fill? We need to resolve the controversy surrounding the influence of wind in kiwifruit pollination."

"I thought you did some work on that with greased glass slides to trap pollen from the air," I said.

"We did," Cam replied, "And I'm certain wind doesn't play a significant role, but there's a nice neat project there for someone to do just to tidy it up once and for all."

"Anything else we can look at?" I asked him. "Sure," Cam said, "We need more study on what constitutes an ideal pollinating hive, we need more work on the hives per hectare question, we don't know anything about the nutritive value of male or female kiwifruit pollen, we can look further at the problem wind breaks may pose for flying bees especially artificial shelter belts, we should look at sequential pollination, is it economic, we need to determine how many visits a flower needs to set seed, can it be overpollinated? We don't know the effects of local orchard microclimates on bee activity."

Cam stopped for a breather so I threw in a few ideas of my own. "How about looking at sugar feeding to stimulate foraging for pollen earlier in the day?"

"Great idea," Cam said, "And how about disposable pollination units like they use on the cranberry bogs in America?"

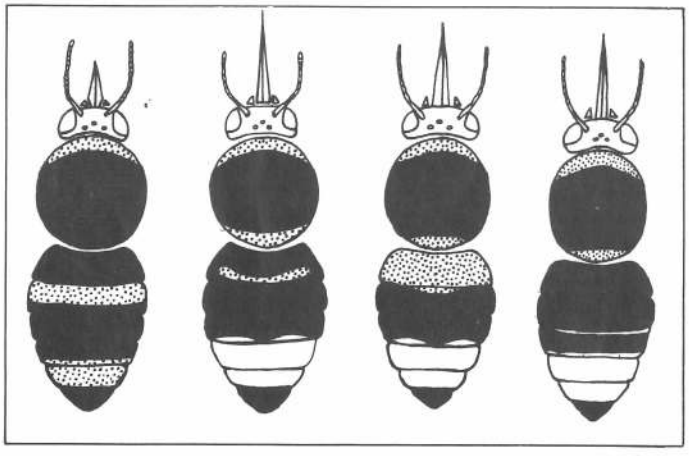
Between us and with the help of other researchers at a meeting in Auckland before Dr Jay left New Zealand, we came up with more problems that need resolving.

We certainly got good value from Dr Jay's brief visit with us. He spoke to meetings of kiwifruit growers and beekeepers at 25 different locations between Kerikeri and Gore during his last two months in New Zealand and didn't complain once. But did he enjoy New Zealand? Well, I guess he did. In a recent letter he said "I have a 12 month sabbatical coming up in four years time and we'd love to come back to New Zealand."

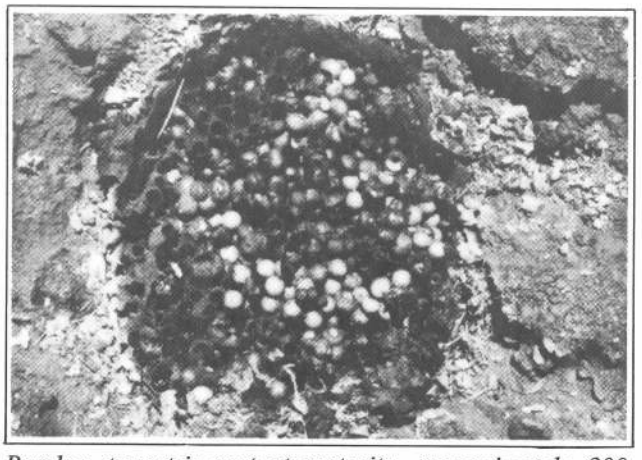
Well, we'd love to have you Cam.

# Massey joins the bumblebee brigade

*DSIR bumblebee and native bee researchers joined by Massey University scientist.*



*Colour patterns of New Zealand bumble bee species. Left to right: Bombus terrestris, Bombus ruderatus, Bombus hortorum and Bombus subterraneus.*



*Bombus terrestris nest at maturity, approximately 300 mm across.*

**by Gordon McShean, Massey University**

THE DOMESTICATION of bumblebees is the goal of Dr Nelson Pomeroy of Massey University's Department of Botany and Zoology. By putting bumblebees in hives he hopes to solve New Zealand's kiwifruit growers' pollination problem.

Bumblebees collect more pollen than nectar (while honeybees concentrate on gathering nectar for their winter hoard). They could, theoretically, provide the pollen transfer between male and female kiwifruit plants far more efficiently than honeybees. Kiwifruit flowers do not provide nectar, and thus honeybees are not ideally suited to the task of pollinating them.

New Zealand's kiwifruit export industry is dependent upon many support services, not the least of which is the provision of adequate pollination. Dr Pomeroy's research could give growers an alternative to renting honeybee hives or relying on as-yet uncertain systems of artificial pollination.

Kiwifruit growers have largely become dependent upon honeybees for pollination in recent years. But now a controversy has arisen over predictions of a shortage of honeybees made by the Development Finance Corporation. A figure of losses of $230 million a year in lost exports by 1990 has been bandied about (kiwifruit exports presently approximate only $50 million). This catastrophy is anticipated because inadequately pollinated kiwifruit will not reach a size suitable for export.

The National Beekeepers Association has disputed claims of a possible honeybee shortage, saying that bee numbers can be increased to meet growers' needs so long as growers are willing to pay the costs. Honeybee hive owners need to be recompensed for their capital investment, time, transportation costs and the loss of honey production which occurs over the two-to-three week flowering period.

At present such costs amount to a fee ▶

▶of about $50 per hive (the Ministry of Agriculture and Fisheries recommends eight hives a hectare of vines). It is anyone's guess how high such fees will go in the future.

Dr Pomeroy theorises that a few bumblebees could take the place of hundreds of honeybees, working faster and more efficiently, doing the job in all kinds of weather (honeybees are notoriously weather-shy).

He has developed an experimental bumblebee hive made of pumice concrete. The hives are stocked by trapping bumblebee queens and protecting the offspring until they are needed for their task of pollinating the kiwifruit. One bumblebee can pollinate as many kiwifruit flowers as 60 honeybees, he claims.

Dr Pomeroy claims bumblebee hives should be produced and managed more economically than honeybee hives. His prototypes weigh only 4 kg, compared to 40 kg for the typical honeybee hive, and so will cost less to transport and put in place. Additional savings may be made because they need not be moved out of the orchard after flowering; the bumblebees' life cycle makes them a 'disposable' resource, easily replaced for the subsequent season. The hives may hold peak numbers of from 50 to 500 worker bees (the researcher's aim is for approximately 200 bumblebees a hive).

Experiments are under way at Summerland, near Levin, and at Te Puke. The trials require fine mesh 'tents' containing one female kiwifruit and one male kiwifruit (with 2/3rds of its twigs removed to simulate the decreased male population in typical orchards). One small bumblebee hive was introduced into each tent during the time that the kiwifruit plants were flowering. The trials were supported financially by the horticulture division of Wrightson NMA.

Dr Pomeroy is encouraged by the first results of his experiments, which are scientifically defined and complete with 'control' fine mesh tents to provide comparisons.

He hopes to be able to provide growers with estimates of the number of bumblebees needed for efficient fruit production, and to provide information about costs of materials and labour required for those interested in developing a commercial bumblebee hive enterprise.

However, results are still too tentative to offer immediate and unequivocal support for a bumblebee pollination regime. He says he hopes to be able to show that bumblebees can be a practical alternative to honeybees within about two more seasons.

He admits that bumblebee pollination won't be cheap, and says honeybees will continue to be an important factor in kiwifruit production. However, bumblebees could provide the extra pollinating efficiency to achieve the predictable, quality harvest necessary for export purposes.

## COMMENT

# Bumble bees are no threat

The bad press faced by honeybees after a difficult 1982 kiwifruit pollination season has now been followed by a glowing Massey University report of the work Dr Nelson Pomeroy intends doing with bumble bees.

Taken together, they make it sound as though the honeybee is about to be declared redundant in the search for the most efficient kiwifruit pollinator.

Not so! In MAF, DSIR and kiwifruit industry circles there is an overwhelming awareness of the importance of the honeybee as a pollinator and the dependence of the kiwifruit industry on the ability of New Zealand's beekeepers to meet the demand for hives.

In September last year when a Mr Wilson of the Kiwifruit Authority met the NBA executive he could cockily state that when artificial pollination was perfected beekeepers' livelihoods would go the same way as those of the people making gas filaments when electricity came along.

We don't know what Mr Wilson thinks today, but many others in his industry are very much aware of Murray Hopping's lack of success with artificial pollination. Even the optimists now talk of artificial pollination perhaps one day *assisting* rather than replacing natural pollination.

The emphasis has shifted quite rapidly in nine months, to the point where researchers and policy makers are making an all-out effort to perfect honeybee pollination techniques in kiwifruit. They are also looking to develop some back-up systems in case something stops honeybees from doing their job.

It is in this latter category that Dr Pomeroy's bumble bee research should be slotted. He has already proved that individual bumble bees efficiently pollinate kiwifruit and it is well-known that bumble bees work in cooler weather and earlier and later in the day than honeybees. But despite many attempts in New Zealand and overseas, no-one has managed to achieve the Pomeroy goal – to keep bumblebees in hives.

Also in the back-up category falls Dr Donovan's work (DSIR Lincoln) on the role of native bees in kiwifruit pollination. While they are said to be effective pollinators in some seasons they are not in others – which rules them out for commercial use.

Mainstream kiwifruit pollination research is now being taken seriously by the powers that be. This coming spring there are likely to be 20 MAF and DSIR scientists and technicians in the field, all co-ordinated by a single committee to ensure there is no wasted effort or overlap.

It's quite a contrast to the situation only 18 months ago when Pat Clinch and a technician at Wallaceville were being forced to handle all New Zealand's honeybee research by themselves. Today, Pat and his technician are being directly assisted by Dr Alan Health, John Tenquist and a technician from Wallaceville's ectoparisitology section.

Their main area of research this spring will be into honeybee behaviour in the kiwifruit orchard. It is hoped that this will enable them to make a firmer recommendation as to the minimum number of hives needed for effective pollination.

In the view of some beekeepers, many kiwifruit pollination problems could be solved by breeding from strains of honeybee which are more active in cool, cloudy or wet weather. However, there is no scientific evidence that such bees exist. Indeed, logic would suggest that if there were such bees, natural selection would automatically ensure their dominance.

Thanks to kiwifruit, the beekeeping industry has the undivided attention of many government scientists. Even if, from a beekeeper's viewpoint, their research is too heavily skewed toward the hairy berries, it ensures there will be a rapid response by scientists and government departments if disease or anything else looked like disrupting the all-important welfare of the NZ honeybee. After all, there is no other way of commercially pollinating the kiwifruit crop.

**—Trevor Walton**

# BURRCOMB

from the editor

## The last "Way we used to Bee"

With the appointment of longtime NZ Beekeeper writer Nick Wallingford to the job of beekeeping tutor at the Bay of Plenty Community College, we lose our "Way we used to Bee" column.

A popular feature of the magazine, we would welcome any articles along the lines that Nick has been preparing. Nick will still make the odd contribution, but his workload will preclude regular writing for the magazine.

You don't have to be a literary genius, and you don't have to write every issue. One item will do. How about it, old timers? We'll rewrite if necessary and forward back a copy for your approval. We'll even make a token payment for your efforts.

There's a lot of beekeepers out there who want to hear of your experiences.

## Poor old Ken

Poor old Ken is really struggling to establish himself as a commercial beekeeper what with a run of very mediocre seasons (the present one topping the lot) and a considerable BL problem. It is an oldish town where he lives with a number of delapidated buildings, large and often hollow willows and poplars are scattered round the district. An ideal area for wild hives – pretty but it will take some cleaning up.

We see a bit of Ken now and then, and lately we discussed what to do after a diseased hive has been removed and dealt with: we told him that we make a practice of saturating the ground where the hive stood, especially the area directly in front, with some petrol. It seems to work as we have had no recurrence of BL in the replacement hives placed on the same stands.

Home he goes, happy to try it out. Operation completed a match was struck and –whoof– Ken had one hell of a job to save the next door hive when it caught fire.

## Rasta-Matheson

Oh, to be so lucky. Andrew Matheson, Nelson apicultural adviser, is spending about three months in Jamaica on a United Nations apicultural development programme. But with the needs of the local apiarists in mind, Andrew suggests that all normal inquiries wait until his return, and that the Nelson office be contacted for anything – especially disease – of any urgency.

We look forward to hearing of Andrew's experiences on his return in July.

## Kookaburra takeover

The March issue of the Australasian Beekeeper has an article about the new Quarantine Facility for Queen Bee Imports at Eastern Creek NSW. It gives a description of the set-up and operations. It also says that New Zealand is now the only country from which queens may be imported without being quarantined. (So let us try to keep that situation, there is no room for error!)

The article is enhanced with a number of photos. On page 176 we see one of an officer in the "SUPPORT AVIARY" well away from the new import facility.

Makes one wonder what is going on there.

Birds and bees, the facts of life and so forth. Or could it be that the Kookaburra is taking over the AI.

## Kind thoughts

We were pleased to hear from Keith Doull, a well known name among beekeepers, who has found The NZ Beekeeper 'interesting and useful'. Keith also sends all his beekeeper friends 'best wishes and good honey flows in the future'.

Keith was formerly with the Waite Research Institute in Australia. He recently retired.

## Those Australians!

Ever heard of the big honey crops gained by Aussie beekeepers? Well in a recent Australian Bee Journal they gave away the secret of their big crops.

"Average production 51.6 kg/hive" (or 5.2 tonnes/100 as we would say). Sounds good until you read the fine print – average production per production beehive (beehives from which honey was taken).

In Aussie they have 530 000 hives (twice the NZ total), of which 72 per cent were classified as "productive" hives in 1980-81, and the rest weren't used in calculating in the production statistics. If you work out their honey production over *all* hives, it becomes a more familiar 36.9 kg/hive (3.7 tonnes/100).

Crop estimates done by MAF in New Zealand include surplus honey only (i.e. not feed), and the tonnes/100 figure is calculated using *all* hives, not just "the ones that produced".

**Nelson Beekeepers Bulletin.**

## Desensitising info

"Today, with greater understanding of allergic mechanisms, and convincing evidence that modern immunotherapy is effective, medical opinion is changing. Hopefully, beekeepers with allergy problems will henceforth be given the option of treatment, and not simply advised to abandon the craft." This said by Dr H.R.C. Riches in conclusion of his 'Hypersensitivity to bee venom', IBRA reprint M109.

Local and systemic reactions, anaphylaxis, and other types of hypersensitivity are described and explained. Methods of diagnosis and treatment are discussed at length.

'Hypersensitivity to bee venom' can be purchased direct from the International Bee Research Association, Hill House, Gerrards Cross, Bucks. SL9 ONR, England, price 95p.

# Are you a keeper of bees; or do you want the bees to keep you?

**by Colin Rope, MAF apicultural adviser, Auckland**

MOST PEOPLE have many goals in life. When I listen to beekeepers chatting among themselves I hear them say such things as their new honey house is going to solve all their problems for them, or their latest model truck with four wheel drive, boom loaders and trailer is the thing they've always waited for, and they say lots of other things like that.

It seems to me many beekeepers are aiming for many different things at the same time, sometimes complicated by family priorities. After all, do fur coats come under the heading of "Protective Clothing" or "Repairs and Maintenance" on MAF's annual cash forecast?

For those people who have decided to make the bees keep them, MAF has prepared a one page paper carefully headed with all the appropriate items every beekeeper will encounter on the way. All that is needed is a pencil and rubber and a quiet night at home filling in all the gaps concerning your business operations.

The aim of this document is to help each beekeeper see the light at the end of the tunnel, in other words it will make him confident and aware of where he is going financially and where he is at right now. It doesn't matter if one is not good at addition; buy a calculator, preferably one with a paper print-out (the kids will love it). At the end of the year your tax accountant will find your sheet helpful too, but that is not its prime purpose. Its purpose is to steer you to your goal by the fastest possible route.

These sheets were prepared by Trevor Bryant of our Tauranga Office, but are available from every apicultural adviser in New Zealand. Get one today.

They can be for your private information, or you may wish to discuss any snags you may encounter with your own apicultural advisory officer in strictest confidence.

As a matter of interest, should one have goals in beekeeping, or is it better to have only one goal to aim for? I think the latter. Don't think in terms of 'so many hives' or 'tonnes per hundred' or 'good, bad and average years' etc. Make yourselves one goal being the number of boxes of honey you must produce to enable you to get to where you have decided to go! If you set your one goal at say 700 boxes full of honey or 1000 boxes full of honey – go to it.

If you want 1000 boxes of honey and only produce 800, do something about it. Get more hives, or manage those you have in a better way to hit the target for next year. Keep your target in mind and your costs at a manageable level and all the things needed to get you there will become apparent as you go along.

In the final analysis always remember that a bumper season is a certainty sooner or later – there is nothing to beat a bumper crop wise folks say. Be sure you're ready to grab it when the time comes.

## Money management example

Let's look at a planned approach to money management using round figures for simplicity and clarity:

| | |
|---|---|
| Say a box of honey is worth $100. Then 1000 boxes are worth | $100 000 |
| Plus beeswax, pollen, propolis and pollination fees | 20 000 |
| Y | 120 000 |
| Z Less Overheads | 20 000 |
| Net income | 100 000 |
| A Tax-free export incentive income (say) | 50 000 |
| Leaves taxable income | 50 000 |
| Less tax | 22 400 |
| B Tax paid income | 28 600 |
| A + B = Profit | $ 78 000 |

When most people complete their MAF forms they usually find fuel and vehicle costs the greatest. These must be contained because it will be seen above at Z that overheads should not exceed 20 per cent of Y. Consequently transport must be planned to enable good apiary management with the absolute minimum of visits. This can be done on a total of five visits an apiary a year. If you are visiting apiaries more frequently, then look to your methods, they need to be streamlined.

The average crop for much of New Zealand is one box a hive a year over a period of years. It is not unreasonable therefore for a keeper with 1000 hives to average 1000 boxes of honey each year, provided he puts the necessary basic work into the colonies. Let us say then, that one apiary of say 30 hives can be expected to return 30 boxes of honey at $100 a box, or $3000 for the said apiary. Consequently, transport costs should be less than 20 per cent of $3000 a year which is less than $600 a year. That relates to five visits a year at about $120 each visit.

If transport costs are about 30 cents a kilometre, then it is questionable whether one's apiaries should be more than 35 km away from home unless one works 60 colonies a day. Exceptions would be to obtain second crops such as tawari, willow or kamahi, or for pollination services.

Another way to lessen transport costs, is to tow a small four-wheel drive vehicle behind a big truck in the same way that caravans are towed. The big truck is left on the roadside while the four-wheel drive truck shuttles in and out of the paddocks with loads. This enables more hives to be serviced in one day, but it means long hours in order to spread the travelling costs.

The classic error to avoid in any business is over-capitalisation. Don't build a big flash honey house and plant before there is enough honey on your hives to justify the cost of one and its ongoing interest payments. Plough back your profits into productive units each year! Pay someone else to extract your crop in their honeyhouse.

Do obtain a MAF annual cash forecast form from your MAF adviser and fill it in for yourself. It will help you to make wise decisions and enable you to see where you are headed in this business.

**Acknowledgements**
Waitemata Honey Co. Ltd and South Auckland Apiaries Ltd.

# FROM THE COLONIES

## WAIKATO BRANCH

About 200 members and visitors attended the branch picnic at Arataki Honey Company's property at Waiotapu with the kind permission of Russell Berry, who worked hard to make the day the success it was. Those who attended greatly appreciated seeing staff operate machinery in the honey house for their benefit, and all were envious of the large amount of steam available from the steam bore.

The branch AGM was held on April 15 and Bryan Clements was re-elected president for a further year. Jim Hishon of Morrinsville was made a life member of the branch at this meeting. Jim is one of the longest standing members of the Branch and has done much to help promote honey at A & P shows.

Bryan Clements established a discussion group last year with a regular attendance of 15 branch members from the Te Awamutu area. Meetings start about 5 p.m. and a fish and chips dinner saves any cooking by the hostess of the meeting venue. Only beekeeping is discussed (no politics) and I understand the meetings are proving of great benefit to those attending. It is hoped to establish other groups in the near future.

Branch members are very concerned at the effect of the weevil on nodding thistle. Many of those involved in kiwi-fruit pollination have been bringing hives out of orchards and placing them in thistle areas and getting a super of honey for which they are very thankful. But with the depredation of the thistle by the weevil, this bonus will be lost. Again the industry will have lost an excellent source of honey because the plant has been declared a noxious weed.

**Ray Robinson,**
**Waihou.**

## OTAGO

Our notes in the March issue did not paint a very cheerful picture as to our 1983 honey crop prospects. Well, the miracle did not happen and it has become the poorest season in memory. Returns fluctuate from zero to perhaps approximately 1½ tonnes per 100 hives. With of course a few exceptions mainly in Central Otago. Further south, it is even worse. In many instances there is not enough honey for wintering and sugar feeding is a very expensive exercise, especially if it has to be repeated again in spring.

A number of full timers have either taken up outside employment or are looking for jobs to see them through the rough patch. It is also sad to notice that a number of beekeeper-employees have had to look for other work in the mean time. Let us hope it will in all cases be temporary for it would be a shame to see training and experience go down the drain.

A number of applications for climatic relief loans have been made to the Rural Bank. These are sympathetically considered and perhaps the best thing that has come out of it is that there is now a possibility that hives will be regarded as collateral. That would mean a real break-though.

The Branch held a well attended Annual Meeting. The same executive officers were re-elected. A sign that members have been well satisfied with their performance during the past year.

Last week the branch committee met to make preparations for our annual Otago-Southland Convention to be held on the Tuesday after Queens Birthday weekend at the Federated Farmers Building in Dunedin.

**John Heineman,**
**Milton.**

## SOUTH WESTERN DISTRICTS

There was no doubting the enthusiasm of at least 65 people who attended a field day at Joyce and Stan Young's Oakura Honey House on March 5.

People were shown how to build their own kitset hives, frames, lids and bases – and assemble them.

Then especially for those with honey to harvest – a demonstration of extracting and packing.

The matter of Health Department requirements for anyone selling honey was also outlined.

There was plenty of discussion through the day with questions ably handled by Ray Scott, Doug Green, Chris Bromwell, and host Stan Young.

Further down the Western Coastline commercial and hobbyist beekeepers alike have carried on with normal autumn jobs such as requeening and wintering down. Most are confirming the fact of a poor harvest – a yield one quarter of average.

In Taranaki it appears the autumn will close with a poor crop from boxthorn. The Taihape flow normally finishing end of January, kept going through into February with a good Manuka crop for winter stores.

This is now time for wasp problems. One apiarist has sounded a warning to take care.

With extracting now complete it is noted that this season's honey is darker than usual – missing out on the predominance of clover in the blend.

A helpful hint – whenever you feel down and need a friend who understands, call on a beekeeper. This season he's been through it all. Yet he remains an optimist, taking a day at a time while patiently waiting for a season four times better next year.

**John Brandon,**
**Wanganui.**

## SOUTH CANTERBURY

Our beekeeping season is now behind us as are our joys and frustrations of the most unusual season most of us have ever experienced. Taking it all around we in South Canterbury have really been more fortunate than those in other districts; most of us finished up much better than I predicted in my last notes.

In all, now all the honey has been gathered, most beekeepers living in South Canterbury should be satisfied we have had close to a normal crop and most hives are heavy in the brood nest.

It is interesting, now there is such a large gap between the price of sugar and the value of honey, more beekeepers are feeding sugar syrup in the autumn to be stored as winter and spring stores. This practice has two values – it is less costly than honey, and it reduces the number of bees overwintered through aging in taking and converting the sugar and so conserving stores.

Autumn requeening, through the spell of fine weather in February greatly assisting, has been most successful.

It may be interesting to beekeepers in areas of pollen shortages to note the local project being assisted both physically and financially by beekeepers.

The local YMCA has, with the co-operation of the Catchment Board and Labour Department, established a work skills project for unemployed youth. An area of ground has been made available by the Timaru City Council and a nursery has been established to propagate nectar and pollen bearing trees and shrubs, of a type not usually handled by commercial nurserymen. These are for supply to farmers, local bodies or other persons free of charge for planting in shelter belts, plantations etc.

In this way we beekeepers are not only assisting ourselves but those less fortunate, the unemployed.

The beekeepers will assist in the distribution of these trees and shrubs and if wisely organised should see some of our pollen short areas return to being no longer a problem area but also places of beauty.

Anyone wishing information on this project can obtain this from our branch secretary.

**Harry Cloake,**
**Timaru.**

## HAWKES BAY

Most beekeepers have closed their hives down; although the crop was poor we are pleased to see the hives wintered with plenty of stores and the bees in good condition. Like all beekeepers, we do not want to see another season like the past one.

Our AGM went off well with most officers returned to committee.

An American beekeeper, Joan Wagner, gave an address on the importance of drone colonies when raising queens.

Ian Berry told us how the Pesticides Board operates and what they are doing.

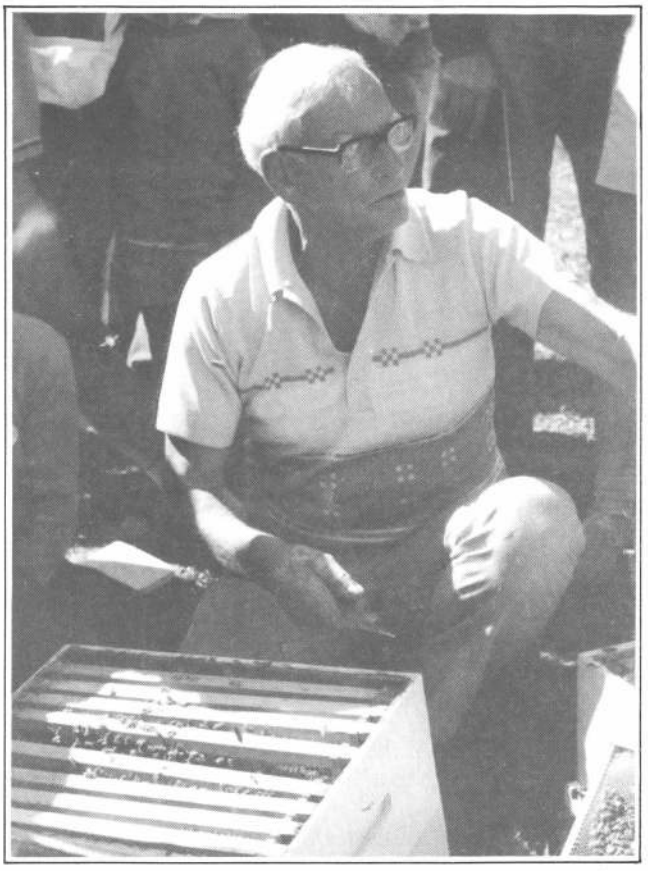
Two films were shown by Martin Taylor.

It was very pleasing to have our two Life Members, Mr McFadzien and Mr Berry for the evening.

Next meetings: Remits May 19 and July 7, same place.

Better beekeeping.

**Keith Leadley,**
**Hastings.**



*Harry Cloake conducting a practical session at Nelson branch's Lake Rotoiti Field Weekend.*

## NELSON

"The Weekend Buzz for Beekeeping Families", held in March at the Rotoiti Lodge, Lake Rotoiti, was very successful. Organised by the Nelson Branch, it attracted some 70 people, mostly from the Nelson, Wellington and Marlborough areas. The venue was chosen so that those family members not so interested in beekeeping could enjoy the Nelson Lakes National Park while the "weekend" was in progress.

Harry Cloake, Gary Jefferies and Andrew Matheson provided excellent material and advice for the workshops, seminars, panel discussions and practical sessions. The Wellington Branch took away the "Weekend Trophy" on winning the evening quiz. This posed such searching beekeeping questions as, "estimate the judges average age?" It was observed that the judges, Jack Varley, Harry Cloake and Gary Jefferies, were very coy in giving an exact answer to this one!

The magnificent setting and perfect weather also helped make it a very enjoyable weekend.

**1983 Conference**

With the 1983 NBA Conference just around the corner, Gavin White and his organising team have arrangements well in hand. Nelson being so conveniently placed geographically there is no excuse not to attend, and don't forget your own potent brew for the mead competition.

Our AGM, in April, saw Gavin White elected as our president for the coming year, and Rex Bolwell as secretary. Glenn Kelly, our past secretary, who has kept the branch ticking over smoothly for the past two years, declined renomination.

**Rex Bolwell,**
**Riwaka.**

## NORTH OTAGO

The season is now finished and most extracting completed and the crop finished up much as expected. Now, of course, comes the tidying up for the winter, combs to render, boxes to repair and paint.

At present, we are getting better weather than we did in the summer and if this mild weather continues, we will most certainly be looking for a spring like we got last year.

One item that is causing us grave concern is the nodding thistle and while we realise it is a noxious weed and a curse to the farmer, it has been a life saver for the North Otago beekeepers. This year the inroads the weevil has made into the nodding thistle has been very noticeable and if the thistle is completely eradicated, a lot of hives will have to be moved off what has previously been reliable thistle country.

This will create greater pressure in the clover country, which in our opinion is already over stocked with bees. I think all we can do is hope for the best and that something else will replace it.

**George Winslade,**
**Oamaru.**

## AUCKLAND

The annual meeting of the Auckland Branch of the NBA was held on Thursday April 21. Mr A. Ellis was again elected president and Mr P.W. Keenan, secretary. The meeting was well attended and a number of topics discussed. It was felt that at no stage could beekeepers or MAF instructors become complacent about brood disease and that the only way to deal with brood disease was to continue burning bees and equipment when found.

A sub-committee was formed to meet local kiwifruit growers to discuss their hive requirements for pollination and an adequate fee for the service provided by the beekeeper.

After a very poor honey season local beekeepers are now turning their attention to getting their bees through the winter with as little loss as possible. A lot of heavy feeding seems the order of the day. It was reported that one beekeeper has had some 20 hives stolen. The thieves did leave one hive; maybe they needed a bigger truck.

**Dave Young,**
**Drury.**

## WEST COAST

The season, if one is entitled to call the part of the honey year that we have endured by that distinction, is drawing to a close. In no way could it be called anything but a frustrating, disappointing season.

The rata flowered prolific enough to provide a better than average crop, but weather conditions decreed otherwise. Every time the weather was fine and warm enough to start a nectar flow, down came the rain again, and turned cold.

Full time beekeepers on the West Coast would be at an all time low at present, but beekeepers wouldn't be beekeepers if they weren't optimists, so some are already providing, and looking forward to a better year next year.

As so often happens after the flowering of the rata tree, the red rata vine is in evidence early and with favourable weather, even into early winter, should provide stores.

Needless to say, now that the chances of a honeyflow has passed, the weather has come right.

**Peter Lucas,**
**Harihari.**

## MARLBOROUGH

After virtually 18 months of drought conditions the 3 inches of rain that fell last week was welcome indeed. Although we beekeepers are not entirely dependant on grass growth for our income, it has still been depressing to see the scoured and barren landscape that has been Marlborough this past year.

Our annual combined field day with the Nelson and Wellington branches took the form of a weekend at the Lake Rotoiti Lodge. An outstanding success, the Nelson Branch can be congratulated for organising an enjoyable and informative weekend. It was certainly good to see so many families attend the weekend's activities.

Our apiculture officer Andrew Matheson is off for three months to Jamaica on a UN apiculture development programme. We hope that he finds the trip rewarding as it must be an interesting occupation – beekeeping in the tropics.

The honey crop this year apart from a few isolated areas was well down on normal figures. Certainly there will be a shortage of honey in Marlborough later on in the year.

However, with last season's lessons well learned, we are all looking forward to another season.

**Craig Deans,**
**Blenheim.**

## BAY OF PLENTY

A generally settled early autumn and some further drought breaking rains assisted the late pasture weeds to produce satisfactorily. Most hives on such favoured sites have adequate winter stores.

The almost continuous cool overcast conditions experienced through April gave rise to excessive robbing during the 'wintering down' work and also caused failure of queen raising efforts.

Research Professor Cam Jay and his wife were warmly received during their recent stay in our area and presentations of significant value (by beekeeper donation) were made to Cam and Doreen prior to their return to Canada.

A call for submissions to the Forest Service, as a reaction to their proposals for a major exotics reafforestation programme of the Kaimai–Mamaku Forest has caused Bay of Plenty and Waikato beekeepers to formulate a comprehensive submission document. We in the Bay of Plenty cannot afford to loose this substantial beekeeping resource.

A 'discussion group' meeting was held in April, which was well attended and contributed to. The topic of discussion was budgeting, led by Trevor Bryant.

Serious concern is held for orderly growth of the kiwifruit pollination service in the light of a possible continued price freeze restraint. Our beekeepers feel they cannot sustain a third year at their same rate. Submission is being made to the Trade and Industry on behalf of the pollination committee.

At our AGM Bruce Stanley and Nick Wallingford were elected president and secretary respectively. Past-president Jim Courtney was well respected for his considerable energy and effort in fostering the aims of the branch during the past two years.

This will be my last branch notes effort. I have really enjoyed the privilege of being able to present my interpretation of branch events during the last few years. Your feedback has been appreciated.

**Bruce Stanley,**
**Whakatane.**

# CORRESPONDENTS

## EVOLUTION A FACT?

Dear Sir,

Articles contributed to your magazine by Mr Williams are usually very interesting. However, I must take issue with him when he presents the theory of evolution as fact.

Evolutionists attribute to insects the power of reasoning. A beekeeper may, due to economic circumstances, discontinue keeping bees, and breed beef cattle. A honey bee could not under any circumstances whatever or over any incredible timespan change from nectar collecting and processing to killing and storing insect larvae.

It is my firm belief that the honeybee was created for the job which she does so admirably by the Master Craftsman.

Yours,

**T.H. Goddard,**
**Blenheim.**

## WHO SAYS THE WIND'S TOO STRONG?

Dear Sir,

Despite comments by Curtis Wicht as reported by NZPA throughout the country, there is no evidence that honeybees cease flying in windy weather.

I have spent many hours in the Massey University library looking through relevant literature to find an article which states the wind velocities at which Apis mellifera will not fly. To date I have not found such an article, nor do I expect to.

It is not a problem, as the honeybee has the ability to cope, due to its capacity for genetic variation and ability to use the microclimates created by vegetation and topography.

I live in an extemely windy area of New Zealand. This year it seemed to blow from the equinox last year to about a week or two ago. Day after day of it.

I keep daily watch on about six hives of bees, as I breed from them. On the days that the wind velocity was so high, that the fruit and leaves from my apple and nectarine trees were blown off, in a sheltered back yard, the bees did not fly. On other windy days they worked normally.

Bees selected and bred in these local windy conditions fly very close to the ground, when it is blowing.

I am concerned that people responsible for kiwifruit pollination and pollination research could believe statements like Mr Wicht's. They have no basis in fact.

Yours,

**R.B. Hargreaves,**
**Palmerston North.**

## GLASS CUTTING AND BEE TREES

Dear Sir,

I wish to raise two issues: (a) I wonder if the correspondence on drilling of holes in brittle glass was necessary. It seems to me that the same purpose could have been accomplished by cleaning a little putty from the corner and using a glass cutter to remove a small triangle from the corner. (b) I have read bits and pieces in "The NZ Beekeeper" about the desirability of planting for bees. So far I have looked in vain for specific information on plants of value to choose. I hope this is remedied in your winter issue in time for spring planting. In particular I would like to know about plants suitable for pollen and nectar sources as well as shelter belts.

Yours,

**Peter von Hartitzsch,**
**Hastings.**

*Copies of the NBA booklet "Nectar and Pollen Sources" are available from P.O. Box 4048, Wellington for $2.50 a copy. By the way, we would welcome a regular series of articles on bee trees from any readers with the necessary expertise.*

# DSIR pollen study complete

*A useful beginning, but NBA pressure needed if research is to continue.*

WHEN IS clover honey, clover honey? When is kamahi, kamahi?

Questions like this might be more readily answered in the near future when the results of a three-year study of the pollen content of NZ honeys are released by DSIR scientist Dr Neville Moar.

Dr Moar has been working with MAF apicultural advisers to establish benchmarks for the pollen analytical characteristics of NZ honey.

He says the work he has done is a useful starting point, but is still insufficiently detailed to enable a specification to be drawn up for NZ honeys. "My work is based on the analysis of 200 samples sent to me by MAF apiculture advisers from around the country. But it must be understood that this sort of work has been conducted in Europe for 40 or 50 years and we still have a long way to go.

"We've shown that a potential exists for such a specification and we could now offer a reasonably informed opinion – on the basis of pollen analysis – as to whether a honey sample is true to label or not."

MAF's chief apicultural adviser, Murray Reid, says that his team has supplied the 200 honey samples upon which Dr Moar's work is based.

"Exporters have been getting into strife, where they have sold honey as clover and it has been analysed in Europe to be 55 per cent thistle. This in turn has arisen because of European packers selling English heather honey which, on analysis, has been shown to be full of manuka pollen."

NZ exporters, says Mr Reid, usually sell their product overseas on colour or type. But where they sell it on a specification, it must by the rules of Codex Alimentarius, contain at least 51 per cent of that honey.

Dr Moar's research is a first step in finding out – by means of pollen counts – the composition of honey samples which by flavour and appearance would normally be known as clover, kamahi, thyme and so on. As such, it is essential information for honey exporters dealing with official agencies overseas.

Further research, beyond Dr Moar's starting point, will however, need the support and pressure of the NBA and honey exporters if it is to go ahead. With a sinking lid policy still applying to government departments including DSIR, research projects are only initiated if there is seen to be a need for them.

It will be up to beekeepers to ensure that their needs are heard in this area.

# Private pollen samples needed

NEW ZEALAND'S late start in the pollen analysis of its honeys has encouraged Palmerston North apiarist R.B. Hargreaves and Professor Ricciardelli D'Albore of the University of Perugia, Italy, to prepare a paper on the pollen analysis of about 50 representative NZ honeys.

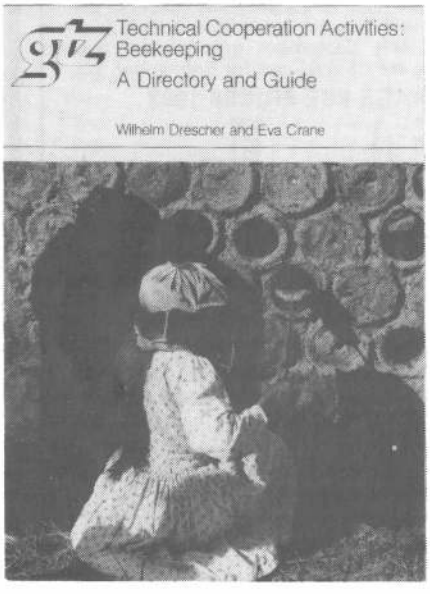
Professor D'Albore is a contributor to the book, "Problems of Melliferous Flora and Pollination" available from the Apimondia Publishing House in Romania. In his paper, he mentions NZ honey.

Mr Hargreaves told the NZ Beekeeper that he wrote to the professor earlier this year after reading D'Albore's paper because he realised that D'Albore's samples of NZ honey were not truly representative. He also offered to obtain truly representative samples.

As a result of this correspondence, D'Albore and Hargreaves have agreed to publish a joint paper based on D'Albore's analysis of samples provided by NZ beekeepers.

Any beekeepers who feel they can provide a truly representative honey type from their area should contact Mr Hargreaves at 28 Pinedale Parade, Palmerston North, to get the necessary guidelines.

## BOOK REVIEW




**Apiculture in Tropical Climates, Edited by Eva Crane; 207 pages; published in 1976 by International Bee Research Association, London.**

THIS BOOK is the report of the First Conference on Apiculture in Tropical Climates held in London during 1976, and not, as its name may suggest, a treatise on all aspects of beekeeping in the tropics. It consists of 27 papers written by a cosmopolitan group of scientists and beekeepers, mainly about *Apis mellifera,* although other species of *Apis* are included.

It describes some of the traditional beekeeping methods used by the indigenous inhabitants of the tropical and sub-tropical regions of Africa, America and Asia. It tells how, in some places, hives are nothing more than hollowed logs with combs attached directly to the walls, greatly limiting colony management. Several development programmes, aimed at improving beekeeping, are also described. Designs for inexpensive hives with moveable top-bars or with moveable frames are included, because most of the inhabitants of these regions are unable to afford hives of the Langstroth type.

Although this book will be of most interest to those involved in beekeeping development programmes, apiarists in New Zealand should be fascinated by the descriptions of traditional hives and beekeeping methods.

*Reviewed by Pat Clinch*

# Feeding dry raw sugar

by Ian Berry

IT IS NOW six years since any of our hives in Hawkes Bay have been fed sugar syrup: during the years that we have needed to feed sugar, we have fed Fiji raw sugar dry above newspaper. This has proved so successful that it would seem unlikely we would change back to sugar syrup in the foreseeable future. Not that we feed all that much sugar per hive – normally around 5 to 20 tonnes per spring to our 6000 hives depending on the weather and also, to some extent, on how our honey stocks are holding in relation to our market prospects. If it seems likely we will be short of honey for our markets, we tend to save less feed honey and feed more sugar.

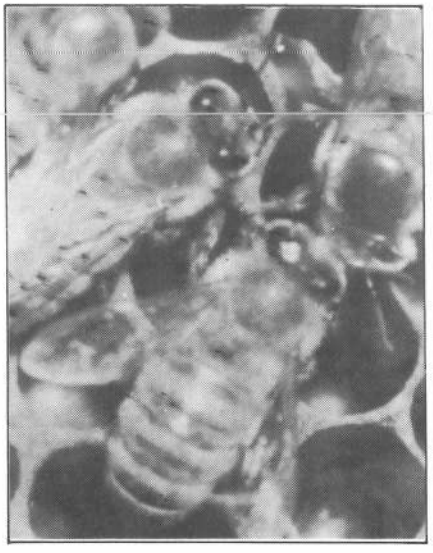
For winter, we usually close down the hives which were requeened the previous autumn two boxes high with 15 kg of honey (six combs), and the hives which were requeened during the autumn either in one or two boxes with 8 kg of honey. We also save about two combs of feed honey per hive in the shed for feeding in the spring. In addition, we shift about 1200 hives each autumn from the harder spring country of Hawkes Bay to the willows which are a valuable source of pollen and nectar during the spring.

As it takes us about two months to complete our first spring round, and because we aim to complete this by the end of September, we start at the beginning of August in the earlier country. At this point we feed combs of honey only. About the middle of September, depending on how many boxes of feed honey we have left in the shed, we start feeding dry raw sugar.

## Sugar feeding

A single sheet of newspaper, 600 mm x 420 mm, is folded over at one end to make a sheet approximately 350 mm x 420 mm. This is placed on top of a two storey hive in the position where it covers that part of the hive which is furthest from the entrance, with the doubled over part of the paper at the back of the hive. A box of combs or foundation is then placed on top of the paper, provided the wind hasn't blown it away, and the frames are spaced. A bag of sugar is usually emptied into a cardboard box or a wheelbarrow and then scooped out, a plastic 6 kg honey container full, about 4 kg of sugar, at a time, and poured into the top box. Care must be taken to keep the sugar at the back of the hive, where it will be held by the paper and not run down into the hive.

As well as feeding sugar, we check that the hive has at least one comb of honey and we normally feed honey only and no sugar to any hive that has less than one box of bees. If we need to feed the bees sugar a second time, we super the hives to four boxes putting the sugar into the fourth box on those which have bees well into the third box.



From experience, we have learned not to feed any dry white sugar above paper, as it sometimes pours down through the brood nest when the paper has been eaten away, and bees seem to have considerable difficulty in coping with sugar in the brood. Raw sugar, being sticky, doesn't do this.

We have also learnt that it doesn't pay to use pieces of tinplate instead of paper because, while some bees took the sugar reasonably well, others didn't and became weak because they didn't use the sugar quickly enough. The paper under the sugar seems to go damp and apparently this helps start the bees eating the sugar.

## Advantages

- The most obvious saving is the fact that no matter how many hives need feeding, it costs nothing at all for special equipment to feed dry raw sugar. One cardboard box, one used 6 kg honey container and a stack of newspaper equivalent to one sheet for each hive to be fed is all the special equipment needed – you don't need the mixing tanks, pumps, tanks on trucks and feeders in hives needed for feeding syrup.
- Because we are not trucking around a lot of water, we are able to load most of the truck with supers, bags of sugar and a few boxes of honey at the back of the truck deck for added traction. We are then able to feed and super our hives in one operation.
- There is no cost at all for the removal and storage of feeders when feeding is finished or, alternatively, no loss of comb space when feeders are left permanently in the hives. Also no top feeders to lift off or on during the season.
- Dry raw sugar gives a more gradual build up for the bees over a longer period. There is less of a feast and famine that you get with syrup, unless it is fed more often than dry sugar, and there is less swarming through the hives becoming too strong too early.
- Bees are drawn up into the top boxes by the sugar and it helps keep down swarming if they are established in the third and fourth boxes before the flow starts.

## Disadvantages

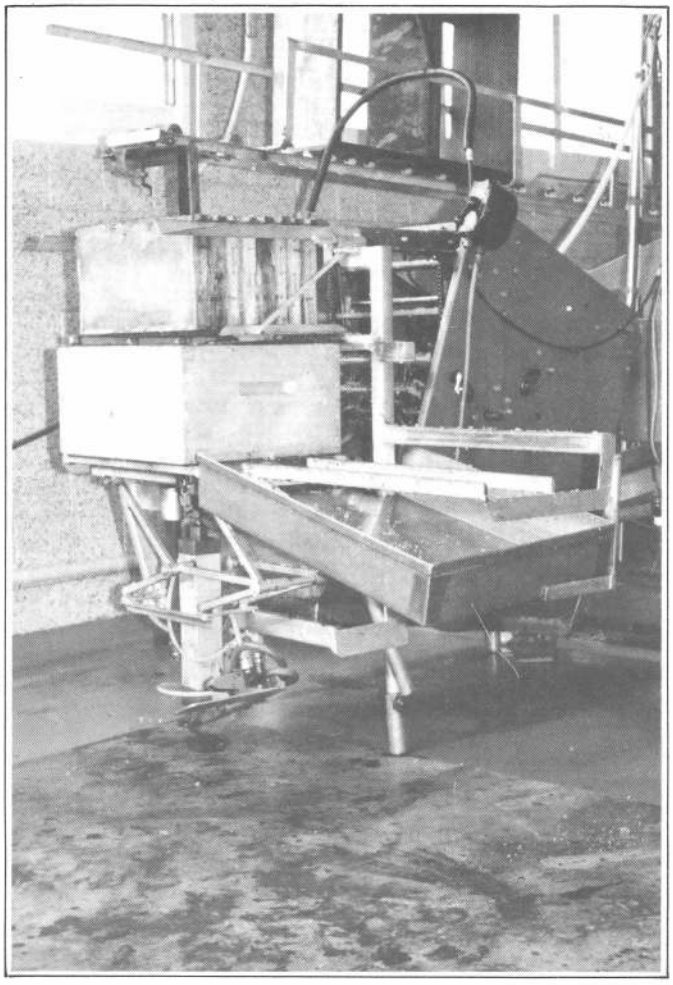
- With a properly set up system for feeding large amounts of syrup quickly, it is possible to feed more hives per day with syrup than with dry sugar and this can be important in an emergency feeding situation.
- Unless the hives are strapped on to pallets, wind and stock damage can be a deterrent to supering hives to three or four storeys before the flow starts.
- Weak hives which need a rapid buildup to reach peak strength at the start of the flow will normally do better on syrup, especially if there is no feed honey left to give them.
- Some hives will waste the sugar by carting it out of the hives. Probably there is no more loss than with syrup not being taken up and fermenting. If the flow starts and the bees do not use the last of the raw sugar, it is a simple matter to collect and bag it to be used next season, as raw sugar doesn't go hard and lumpy like white sugar.

Dry sugar feeding may not be the answer for feeding large amounts of sugar per hive nor may it be as successful in all other districts as it is in Hawkes Bay, but the advantages are so considerable I would suggest it may be worth a trial whether you want to feed one hive or several thousand.

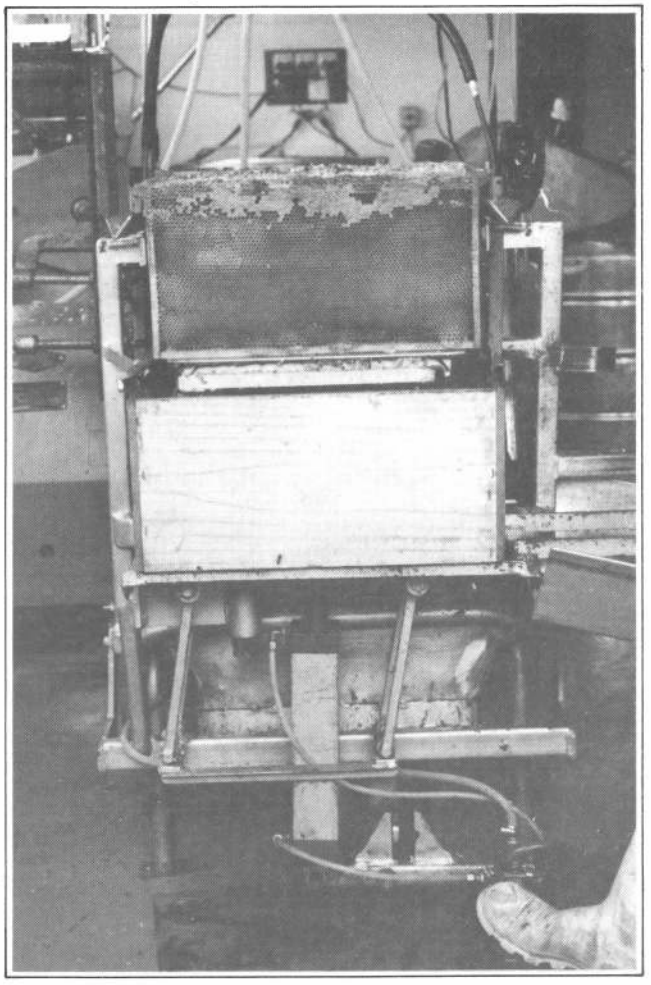
# An automatic de-boxer

**by Cliff Van Eaton, apicultural advisory officer, Gore.**

*The de-boxer, complete with metal track and scrapings tray.*



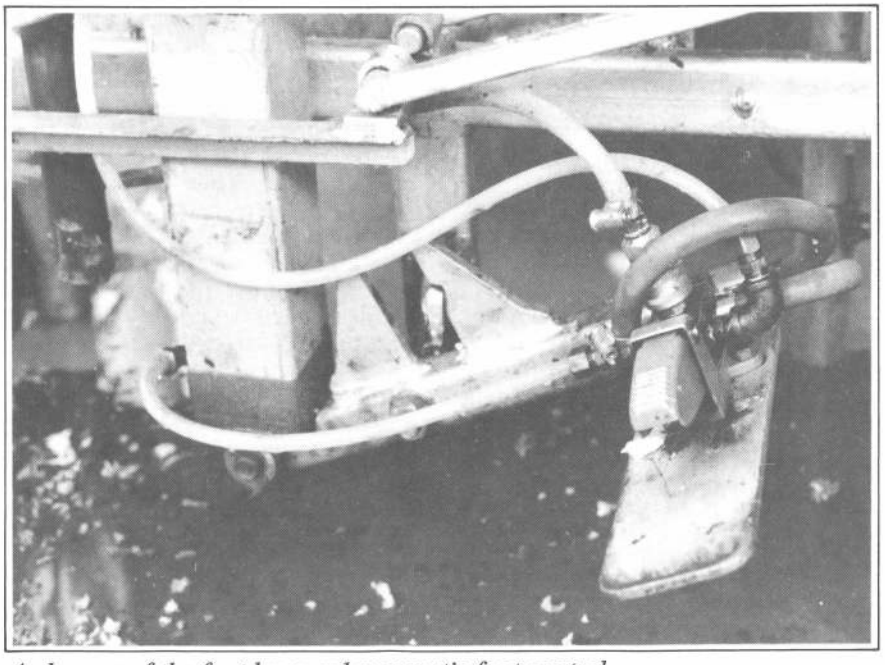
*The de-boxer in operation.*



IN THAT never-ending quest for automation in the extracting plant, nothing so drives a beekeeper like the back pain at the end of a 250 box day. When you think about it, electric barrows, automatic uncappers, and even the first extractors all must have had their beginnings with the sigh, "there's got to be a better way!" Labour-saving was no doubt the basis behind this automatic de-boxer, and Alan Ward, together with his sons Ross and Peter have come up with an addition to their extraction gear which certainly advances the cause.

The device uses pneumatics and lever action to place full supers of frames on guides ready for advancing into the uncapper. The idea had its beginnings with Trevor Bryant's visit to Canada, was refined by the Wards, and ended up as a finished product constructed by Aparima Engineering, Gore. Total cost, in 1981, was $500.

To understand how the de-boxer▶



*A close-up of the foot lever and pneumatic foot control.*

works, let's trace a full super on its way through the extraction system. To begin, a stack of supers is lifted by electric barrow so that the top super is even with the metal track leading to the machine. The super is hand-shifted on to this track where it can be turned on end and scraped, top and bottom, to remove all burr comb. A tray is fitted underneath the track to catch these scrappings.

Next, the super is slid along the track to its position on the de-boxer. Angle iron around the bottom rim holds the box in place over the metal plate. It is this plate, connected to an air ram, which lifts the frames out of the box.

But the whole plate and ram assembly is also raised several inches by a foot lever connected to the base of the ram. The system was designed that way to economise on the height needed from the ram, since the cost of the ram is determined by the inches of rise it produces.

However, the Wards soon discovered that the lever action (and the two-step parallelogram risers) had an added benefit as well. By stepping sharply on the lever without using the pneumatic foot switch, the machine will safely dislodge frames attached to the super sides with bridge comb. Using the less-easily controlled pneumatics tended to break the bottom bars on these heavily fastened frames.

Once all the frames have been freed up the operator steps on the pneumatic foot control. The ram drives the plate upwards, lifting the frames as a group toward the two guide arms positioned even with the chain-feed of the uncapper. These arms, constructed of 2" angle iron are spring-loaded and turn on metal shafts fastened into a second set of stationary guides. At rest the arms are positioned at 45° angles inward, but as the frames are forced against the arms the arms rotate, letting the frame lugs pass. Once clear the arms spring back, holding the frames securely under the lugs.

To remove the super the operator simply releases the foot peddle, retracting the ram and attached plate just below the bottom of the box. The super can then be pulled out, and in the Ward's case placed on a roller conveyor leading to the far side of one extractor. The supers are thus within easy reach when the extractors are unloaded.

The de-boxer uses a Martonair foot switch and a Martonair 3" (75 mm) diameter two-way ram. The ram has a stroke length of 10" (25 cm) and uses a 3/8" (9.5 cm) delivery hose. The compressed air system is vented into a small plug of fibreglass batting packed into the channel iron section of the foot lever. This muffler greatly reduces the noise produced by the machine.

The Wards have been most pleased with the performance of their de-boxer to date and have only had to make one major alteration, a reinforcing of the pivot point on the foot lever. For the future there's at least one improvement they would like to add. As Peter Ward said, after operating the de-boxer all day, "if only we could make the thing self-feed the uncapper." Need we say more?

## BEE FORAGE

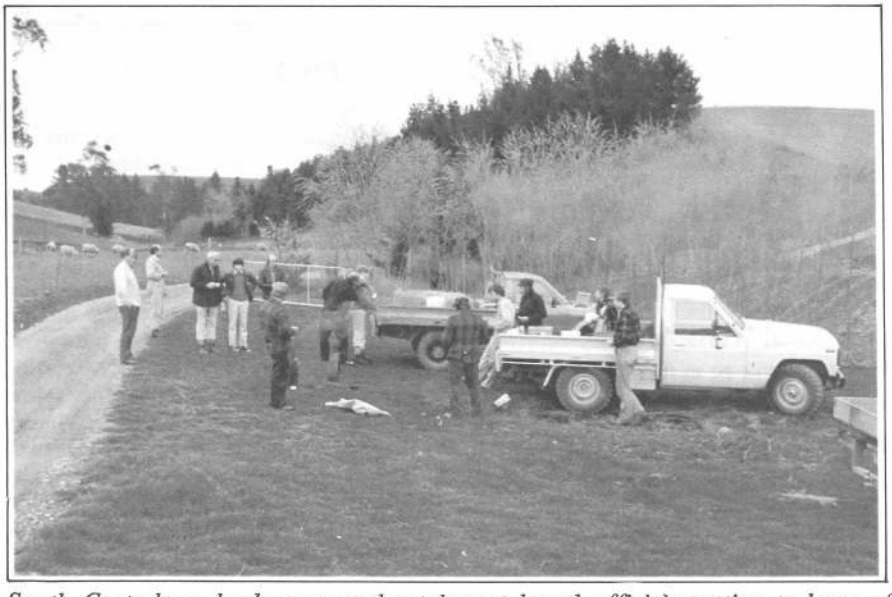
# Beekeepers can do something about disappearing bee tucker

**by Kerry Simpson, apicultural advisory officer, Oamaru.**

LIKE ALL beekeepers I feel depressed at the sight of bulldozed gorse or barberry hedges replaced with post and wire, and feel sickened at the sight of nasty maggots eating out beautiful purple thistle heads. Some nectar and pollen sources have disappeared leaving very depleted spring forage, the plains areas of South Canterbury for example. So what can we do? Complaining is cheap, easy, but will not achieve any results. Here are some positive suggestions that are being done, and which could become more widespread.

### Plant your own sources

This is most easily carried out on your own property or land on long term lease but in some areas, it could also be possible on wasteland or roadsides near apiaries. Impressive plantings on the properties of some of the well established beekeeping families show what can be done. The plantings done over the years by Bill Herron were a pleasure to see at the recent Southland field day even in indifferent weather conditions.



*South Canterbury beekeepers and catchment board officials getting to learn of each others needs.*

Many beekeepers who have blocks of land could do much by way of example to farmers by well planned multi-purpose plantings. Become a tree enthusiast and get to know what grows well in what conditions in your locality. Aim to plant and care for one, two or three hundred trees a year for the

▶ next few years, whatever you can look after well. There is plenty of advice and knowledge available. You do not have to make all the mistakes yourself. Join the local Farm Forestry Association or Tree Crops.

### Tree planting

By joining associations you will not only learn from others but can communicate too. We all know that many people think that you put boxes on hives in a paddock and honey and money fall out when you take them off. You will be able to explain the problem areas of spring deaths and exposed apiaries, but just don't overdo the moaning.

I have been pleased with the attitude of the local Farm Forestry Association towards the role of bee forage in planting. In the competition for the best planted farm, the committee has decided to have bee forage plantings as one of the criteria for judging, along with shelter, woodlots, rotation and pruning. The suggestion was made and supported by farmers without any pressure. Gentle public relations without either going overboard and overstating the problem or boring people with the same old stories works wonders.

Nectar and pollen sources should have an integral part in farm plantings and can fit in well with shelter, woodlot and amenity trees. That is the message and you also need to have specific recommendations of what to plant where. Most apiary advisers have lists of suitable species either available or in the process of publication. You may well like to add your own favourites (so long as they are not on the noxious weeds list).

A lesson could also be taken from Fred Bartrum's involvement in Parks and Reserves plantings. Instead of just complaining, he has actively assisted in a programme to refurbish the Pleasant Point domain. Many thousands of trees have been planted, watered and carefully tended by the use of temporary employment labour. I am sure that a visit to this area would encourage more beekeepers to become active in fostering tree planting in their own area.

### Planting programmes

The Ministry of Works and the Catchment Authorities produce and plant trees by the millions. Do you know what they do in your area and do they know your needs?

Very successful liaison has been established in some areas between NBA branches and Catchment Boards to the benefit of beekeepers.

Catchment Authorities are involved in two major forms of conservation, the prevention of water and wind erosion of soil. They have engineers who work on river control (and upset beekeepers by removing willows in some places), but they also plant willows in other areas. Their soil conservators work with farmers to revegetate bare soil which is subject to erosion and advise and administer subsidised shelter plantings in some areas too.

Two excellent days have been spent by South Canterbury and North Otago beekeepers finding out about the work of the South Canterbury Catchment Board and the Waitaki Catchment Commission. In both cases better understanding on both sides has resulted. A similar day is planned with the Otago Catchment Board in Central Otago later this year. If your branch does not have contact with the local board it could be very worthwhile.

From the liaison with the South Canterbury Catchment Board a very interesting development has occurred. A Department of Labour scheme run by the YMCA to train young unemployed has established a small nursery to produce carefully chosen bee forage plants. The Department of Labour supplies the wages and local beekeepers have donated several hundred dollars for equipment. As it is a work skills training programme the plants cannot be sold so they will be given to the beekeepers. They in turn will give them to farmers to include in existing and planned shelter belts and amenity areas. The actual planting may well be done by the work skills group.

It is an exciting and positive scheme and I hope it works out well. Could it eventually lead to beekeepers, to branches, getting hundreds of thousands of plants grown on contract for inclusion in Catchment Board shelter schemes? With trust funds and forward looking attitudes from beekeepers perhaps it is not just a hopeful vision. At least a start has been made in one area.



# Golden bees golden tempers

**by David Williams**

MELANISM IS defined as the development of dark colouring matter, hence Melanesian or melanite. Ronald Pearson's "Climate and Evolution" has one small snippet on melanism: "Gloger's Rule, that dark colour due to melanin pigmentation is more strongly developed in warm and humid environments, is clear in man but needs qualification elsewhere. Clearly the needs of crypsis in a dark coloured environment will lead to its selection."

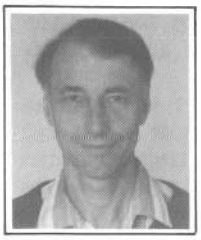
Which I take to mean that men dwelling in the tropics will be dark skinned but that organisms such as insects will tend to melanism where they need it to merge with the background.

To those who have known the brilliance of the tropics it is obvious that a light coloured insect will blend in well there while in the dark and gloom of Europe a blacker bee would be less noticeable to man and other predators. We should expect a strong correlation between mean summer temperature and melanism and this is obviously true. The English black bee was well known before being supplanted by better producing introduced strains, just as the dark bees of Germany are mentioned in numerous texts.

We can perhaps take it that the original honeybees were golden and gentle, luxuriating in the hot sun of Asia and the narrow winter/summer temperature range. Then as they slowly spread into less salubrious climes the colour gradually changed from gold to leather to brown to black over the millennia.

This was accompanied by a change in temper. We can certainly say that darker bees are worse-tempered even in New Zealand, thanks to Ivor Forster's research work, but it would be an error of reasoning to say that they are evil because they are dark. Rather, the same factors that changed their colour changed their temper and these were undoubtedly climatic. The same climate that changed from sparse and light to green and thick also meant a harder life for the bees, enemies fiercer, the struggle for existence more pronounced, the need for quick temper and fast response greater.

From this it further follows that the closer we get to the source, the more golden the bee and the more golden its temper. This is the aim of every amateur, to have bees that are kind to him.



**The second article in a series by David Williams on the bee today, yesterday and the day before yesterday.**

# Diet and efficiency

THE HONEYBEE probably originated from some carnivorous wasp-like ancestor, changing from flesh eating to a nectar diet. We do not know what initiated this change, nor why. There is a large element of chance in any genetic success and it is chance that gives us our honey surplus today.

What we can say is that the change was not necessarily an advantage to the species even though it has allowed the survival of that species. It may instead be merely a biological device to exploit the full range of food available.

## Plant propagation

The first land plants propagated by cellular division, a necessarily primitive system which later became more efficient as the speed of division increased and is still used today.

Eventually the spore-bearers developed, releasing vast numbers of minute reproductive cells with a low survival rate. These, too, are still with us.

Then came the gymnosperms, the "naked seed" species, of which the conifers are an excellent example, creating large areas of pure stands and reproducing by releasing vast clouds of light, dry, wind-blown pollen, the male element, some few grains of which would be trapped by the sticky female strobili to initiate fertilisation and seed set in the clusters we know as cones.

It has been suggested that the "age of the beetles" coincided with the rise of the angiosperms, of those plant species that have reproductive organs based on the floral systems we know today and that this was not, in fact, coincidence. What is conjectured is that the beetles were such a busy, scurrying, worrying, savaging army that the plants reacted by developing techniques to use them for pollination purposes rather than merely being gnawed and eaten by them.

To do this the flowers developed a reward system, one that would positively attract pollinators to them by supplying a food source, depletion of which would present no threat to the plant, and then by developing shapes and colours that would actively encourage their identification as such a source.

## The advantages

This means of getting male elements to female, by having them carried there attached to the bodies of visiting insects, had distinct advantages for the plant. Now it need produce only a fraction of the number of pollen grains required in aerial distribution and could count on them being randomly distributed, not merely sent down-wind. True, the grains now had to be heavy and sticky for attachment to the insect but stands no longer needed to be of vast area nor exclusively of one species.

Even a few scattered plants could confidently expect to be pollinated nor was it necessary for all plants of one species to be more or less the same height although this habit was generally retained for other reasons.

We can see why such a food source demands specialisation, not only of mouthparts for gathering, but also for processing and storage. In most climates and continents there will be vegetation to eat or prey to devour, possibly variable in quantity and quality with the season, but generally available. Not so for nectar sources except in some highly favoured areas.

The fact that the honeybee has survived so well in so many locations is a tribute to the efficiency and enthusiasm with which it has adapted to a specialised diet and to the limitations of that diet.


## What is food?

If we say that all mobile and some immobile organisms need protein for growth and carbohydrate for energy, we are in danger of grossly oversimplifying a most complex chemical process, but the concept will at least allow us to approach the question of diet from a layman's point of view. First, protein and carbohydrate. From a simple science dictionary (Godman, 1981): Carbohydrate – a compound consisting of carbon, hydrogen and oxygen . . . Starch, cellulose and all sugars are carbohydrates. Protein – a kind of compound formed by the chemical combination of many molecules of different amino acids.

To which we have to add that amino acids are the building blocks of life, so that even we humans must have an adequate intake of protein to allow renewal of various body cells as they break down.

## Expansion

Such a system having been evolved, clumsily at first but then with increasing variety and sophistication, other orders of insects adapted to take advantage of this food source – the flies, moths, butterflies, etc.

So Holroyd (1968) can say: "Obviously insects can have evolved the habit of visiting flowers for food, and any special mouthparts that may be needed, only since the flowering plants first appeared in mid-Cretaceous times. Three of the most advanced orders of insects, Lepidoptera, Hymenoptera and Diptera have flourished in that period, ▶

and in each case their evolution can be closely linked with that of the flowering plants themselves."

### Limitations of diet

In spite of our interest in this food source and our enjoyment of the insects (and even birds) that utilise it, it still remains a minor food item overall. Most living things either eat each other or the nearest plant.

There are excellent reasons for this. A flower is only interested in attracting pollinators until it is pollinated. After that the nectar dries up and the food source disappears.

If an insect is to rely on an exclusively flower-derived diet it must have floral sources available year round, or some method of gathering and storing an adequate surplus in a re-usable form, or be able to hibernate, to ensure that sufficient numbers survive dearth periods to guarantee continuation of the species.

### Digestion

As the incomparable Ariadne says: "Digestion is essentially just hydrolosis. By reaction with water, proteins are broken down into their individual amino acids, saccharides into simple sugars, and fats into glycerol and fatty acids."

Holroyd (op cit) adds: "All living creatures must have food, which they use for two main purposes: as raw material for the construction of new tissues, and as fuel to be oxidised and thereby quickly release energy."

Plants do this simply and efficiently. The animal kingdom, including the insects, must work harder at it. For simplicity we will subdivide the animals into two groups, the herbivorous and the carnivorous, the plant eaters and the flesh eaters.

Plants are largely composed of cellulose which is difficult to break down and digest. The real nutrient is in the cell contents. Plant eating species must ingest large quantities of material, process it as best they can, and get rid of large amounts of waste. They must spend a major part of their time simply eating and digesting and this goes all the way from caterpillars to giraffes. It is no surprise that the majority of insects developed other feeding systems, as did certain animals.

One of these systems is simply to let some other organism do all the work of processing cellulose, to concentrate the nutrient, and then to eat it. Lions do this well. They allow gazelle or zebra or wildebeeste to graze and grow fat and then eat them. A zebra may spend 10 to 14 hours a day grazing and much of the rest ruminating. Lions spend most of their time lying in the sun waiting to get hungry again.

Between these two opposing systems are the intermediate ones, the leaf miners, sap suckers, wood borers and the nectar sippers. It is the nectar sippers we are concerned with here and which we will be looking at in more detail.

### References

**"Ariadne" 1981** in New Scientist, 1 Oct 1981, p. 80.

**Godman, Arthur 1981** Longman illustrated science dictionary. Beirut: York Press.

**Holroyd, Harold 1968** Elements of entomology. London: Weidenfeld & Nicolson.

# Feeding liquid honey to bees - don't

MORE IN sorrow than in anger I report that I have an enquiry from a beginner beekeeper whose extracted honey began to crystallise in his plastic storage bin so he ladled it off into jars except for the last few litres in the bottom. This, he says, included large semi-solid lumps and a bit of heavy debris.

Not quite knowing what to do with this mostly liquid remnant, he put it into a large basin and put the basin resting on the top frames in one of his hives with a spare super round and lid above.

In spite of having ample floaters in the mixture "the bees drowned in their thousands". They always do. There are ways of recycling this stuff without loss BUT the best way for amateurs, and the only one I am going to recommend, is to simply put the stuff away in some suitable container in some cool place and allow it to set solid, just as all your other honey will. Then you may feed it back to the bees without losing a single one of them.

Put in the top as is, they can nibble away at it as they feel like it. Scooped out into a normal frame feeder, they will accept it as readily. All this takes place without the excitement and mortality associated with it in its liquid form.

The bees often remove the liquid fractions from crystallised honey and leave the white, sticky sugars behind. These may be left for them to work on or damped down from time to time with a little water to make it easier for them.

NEVER feed liquid honey or expose it or any frame containing it. That is just asking for trouble and, as the saying goes, them what asks, gets!

# Readers' queries

**Mail your questions to: 'A Fresh Start", 26 Otonga Road, Rotorua. They will be answered by Mr Williams personally and suitable ones submitted for publication.**

## COUNTING BEES

Dear Mr Williams,

A simple question: How can I accurately estimate the number of bees in a hive?

Before your tears of laughter make this sheet so sodden you can no longer read it, perhaps I should ask this: How do you accurately estimate the number of bees in a hive?

I'm speaking of a Langstroth hive, standard depth (9½" nominal), and I use 10 frames in both brood chambers for each colony. I've been keeping bees the past 10 years and am beginning to feel a bit comfortable around the little buggers. I also dare to brag that I think I understand some of the basics now. But colony population estimates are beyond me – and beyond everyone of my acquaintance though they'll be the last to admit such.

There must be a quick, competent method. This is one subject I've not seen addressed in print, but it seems everyone but me can state (with authority?) things like, "That colony is a little weak, only 32 000 bees." Or, worse, "Yah, that's a strong bunch, all right. I figger there's easily 58 500."

Try to pin 'em down with "dumb" comments like, "How come with 58 000 bees you have only two boxes?" "Aren't you a tad worried about swarming? So many bees and only one queen . . . you know, the pheromone may be some weak and . . ."

I can estimate brood area okay, because for years I've used a grid device that has educated my eye quite well. I can count (estimate) dead bees, as from a pesticide kill, simply because I've laboriously counted thousands of bees in given small areas to, again, educate my eye. But these things seem of no value when I'm trying to accurately guestimate how many bees are in a colony when I want to select those for wintering, or some other special purpose. Again I say there must be a competent method.

Can you help?

Yours,
**Dave Tozier,**
**Alaska.**

*Nice to hear from you. Of course there is no way to accurately estimate hive population! In fact "accurate" and "estimate" are antithetic in this context as far as I am concerned and probably equally so for all your acquaintances who boast of their skill in this, regardless of their claims.*

*Usually when I am asked this question I reply that they should count the legs and divide by six. If the questioner would obviously not approve such levity I say that colonies only come in three sizes, small, average and large. These may be difficult to quantify but we all know them when we see them.*

*For myself, I take as the roughest of approximations that one solidly covered frame, one on which the comb itself cannot be seen for the bees covering it two or three thick, as equalling five thousand bees. Lifting outer frames away and going up in multiples of five thousand and proportionately lesser amounts for less covered combs makes it easy. If the four central frames on each of my two brood chambers are well covered I take that as a moderate colony of forty thousand bees with perhaps another ten thousand bees out in the field. That would be in October and that colony would then develop into a nice eighty thousand strong hive by December, ready for our honeyflow.*

*Note that such estimation ignores brood. It merely estimates bees and this can be done in a few seconds at each examination and so can be used to check progress which in turn decides what I have to do next. If you really want to check your estimate, shake all the bees into a plastic bag, weighing the bag before and after filling, taking 7700 bees per kilogram. And good luck!*

*Sincerely,*
**David Williams.**

## FOR SALE

**Bees and Honey**

An excellent booklet, originally produced for schools and other educational purposes by the NZ Honey Marketing Authority.

Minimum order, 5 copies: $1. Additional copies 20c each.

*Write:–*

**Bees and Honey**
**P.O. Box 4048, Wellington**

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**Nectar and Pollen Sources of New Zealand**

A guide to bee forage plants. An updated version of a text first prepared by R.S. Walsh in 1967.

This 1978 edition lists source plants in chapters according to the seasons in which they bear nectar or pollen. Additional chapters are also included on the flight range of bees, the function of the flower and district planting notes (originally prepared by the NBA).

$2.50 a copy, from:–

**Nectar and Pollen Sources**
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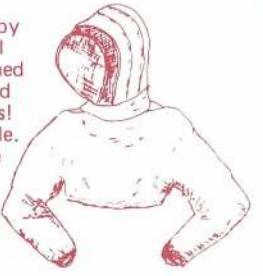

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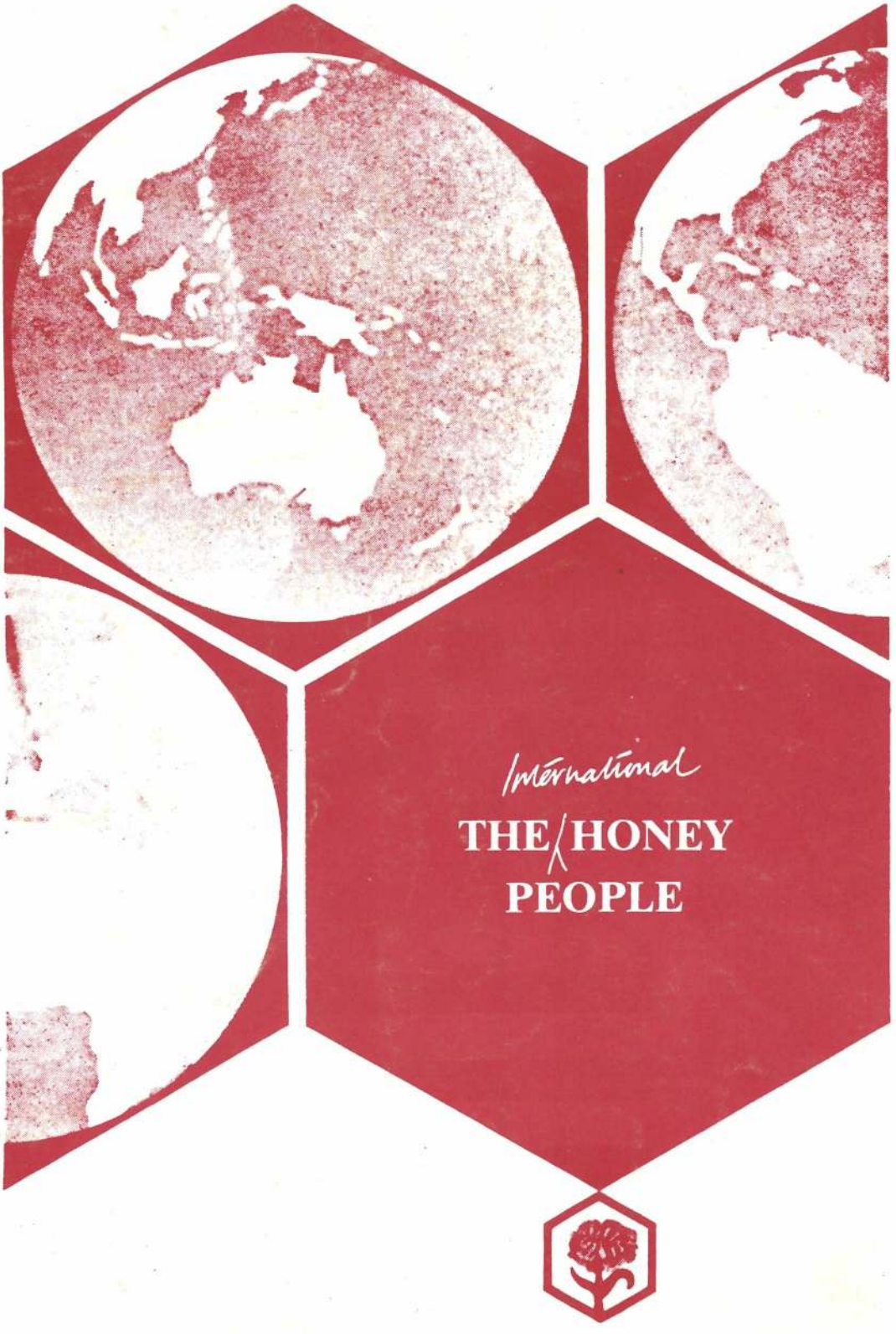

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