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The New Zealand **Beekeeper**



1985

Summer

JUL 1985

The New Zealand Beekeeper

OFFICIAL PUBLICATION OF THE NATIONAL BEEKEEPERS' ASSOCIATION OF NEW ZEALAND
INCORPORATED

CIRCULATION 1,450

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By Murray Ball



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Beekeepers, like sheep and cattle farmers, will find themselves more and more on their own as time progresses. All will find that with protection being steadily eroded the south wind do blow exceeding cold.

This trend to let primary producers stand on their own feet is not confined to New Zealand. Peculiarly enough, the present right-wing government of the United States is treating its corn and wheat farmers similarly. Clearly then, this thinking transcends political boundaries: possibly in the new countries because increased efficiency has decreased the number of people employed in primary industries and therefore their effect on the ballot box. Whatever, it is a fact of life somewhat frightening for us when we consider the protectionism that remains in parts of the world, particularly Western Europe.

However, an act of protection is like a lie: install one or tell one and you soon need another to maintain the credibility of the first. In the end the result is to have such a conglomeration of regulations, and officials to implement and police them, that the simple matter of raising a field of wheat, a sheep, or possibly a hive of bees, becomes so complex that it is hardly worth the candle. Perhaps, therefore, it is just as well the deck is being cleared.

So where does this leave the New Zealand beekeeper now the Government shelter belt is being chopped down? Simply he must promptly plant his own while he looks to his act. Going for him immediately is the efficiency of his industry.

And agronomy in New Zealand is efficient. The late Sir Keith Holyoake, while serving as Minister of Agriculture some years ago, returned from the USSR with the message that Soviet farmers used 30 people where we used one. That in itself is a strong cost-factor strike in our favour. However, it is a base to start from, not a laurel to rest upon.

The beekeeper must look to further improve his efficiency without allowing himself to be sidetracked by such excuses as our strong dollar (it was much stronger years ago and we survived then), the price-cutting of supermarkets (that surely is simply business?), and the umpteen other excuses the negative thinkers will produce.

The simple fact is that the more the beekeeper helps himself the more he will legitimately be helped. The MAF has already stated its policy of helping the industry to the degree the industry deserves to be helped. Therefore, help from that source clearly depends on you.

Certain factors stand out.

Primarily honey must be marketed as a spread at least equal to that jam advertised by the "man on TV". We

know it is as good, if not better, so the world must be told. Its varieties of flavour, depending on source, need highlighting. The market needs creating the way the wine market was created. Forty years ago the wine market was a jar of sweet sherry for the women when you bought the keg. Now it has become a multi-million dollar business. That wine is presently being overproduced is a side issue.

Equipment and methods. These lie in your hands. Far more inventions and modifications have come from backyard bicycle sheds than the most heavily-endowed research laboratories. So clear out your shed and get weaving.

Disease prevention and health. Much has been said and written about this recently so let's not labour it here. Let it suffice to say that you know that a healthy, disease-free, bee will produce far better than an unhealthy one.

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Michael Burgess

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To The Editor

Dear Sir,

I am visiting New Zealand from October 1986.

I don't know enough about the varied possibilities of getting a job on bee farms located in various parts of your country. I don't know which of the newspapers would be the most useful to me.

I have been told that the formalities (working permission, passport etc.) take no longer than two to three months.

I think beekeepers read the 'NZ Beekeeper' more carefully than their daily newspapers, so I am a Finnish beekeeper, age 23, looking for job (beginning October 1986) on a larger bee farm. Please write: SF-35550 Salokunta, Finland.

Juhani Lunden

Dear Sir,

At a recent general meeting of the Canterbury Branch members were unanimous in their disappointment at the lack of support for their remit concerning biological control of gorse. We appreciate that at the moment the value of gorse is more critical in some areas than others, but Canterbury notified all other branches of the importance of gorse in its area.

Mr David Butcher (Undersecretary for Agriculture) said in his opening address at Conference . . . : "I look forward to learning the outcome of the debate (on gorse) that will surely follow". He was obviously seeking the opinion of the whole industry since he had already heard the opinion of the Canterbury Branch when he attended its AGM.

Remit 8 (Southland), passed unanimously by Conference, and asking the National Body to make submissions to the Government on the economic importance of gorse, had already been undertaken by the Sandry Report.

The Canterbury Branch sought support in vigorously opposing the biological control of gorse. The concern of some delegates that this might upset farmers is of little value in presenting the industry's viewpoint. Federated Farmers are perfectly capable of presenting their own case.

To achieve anything in an industry as valuable as ours we must appear united. This unity which is so vital was sadly lacking in the ultimate outcome of the debate.

Canterbury Branch Executive

Dear Sir,

The bright spark who instigated the concept of the proposed levying of 10 or more hives is truly one of the greats. If he lurks within our ranks he can be blessed for one thing. This is that at long last perhaps the rift between the levy payers and hobbyists will be smoothed over.

The negatives of the idea include an open-faced

playing into the tax collector's hands. Nice touch that one. If funds to MAF weren't being tightened, and therefore reducing apicultural interest within the department, the whole thing wouldn't seem so bad. My cynical but utterly pure mind cannot equate this lot. Will beekeepers be informed of just where the revenue will be heading? Will it go into rural roading, (a network of pockmarked tracks), Rural Bank bins for later distribution to beekeeping loan seekers (humans with deformed limbs to assist them sliding along the ground), health (you're on a waiting list for so long you either die or forget what is wrong with you), or education (seems its more important for a thirteen-year-old to be aware that kinkies see bovines only as leather and who cares if pies are squared).

No, I suspect it will go where the apples and milk went in Animal Farm. We the horses, cows, and sheep must work even harder on windmills. We mustn't worry about strained backs and taut bellies — we are being thought of.

Victoria Whittle

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Comment

from Lindsey Hansen

At the tender age of 36 I have now retired from commercial Beekeeping. It's a very fitting time, because my father Raymond has passed on in his 75th year. He became involved in keeping bees 61 years ago and left with as much feeling for the bees as when he started.

His reasons for leaving the bees are obviously quite different to mine. It has struck me for quite some time that we live in a very temporary world, and the burning desire to accumulate assets or "liabilities" is surpassed by a keenness to experience more of the world around me.

I see a very special need if this industry of ours is to prosper for us to:

- Present a united front in at least one of the many areas essential to our well being.
- Agree to agree
- Agree to what our problem areas are
- Agree on what we are worth
- Agree that true friendship between each of us is essential
- Agree on what MAF's place in the industry is or should be
- Openly discuss with each other the effectiveness or otherwise of the NBA
- Put aside our preconceived ideas and listen to our fellow beekeepers.

I believe there is a great potential for the beekeeping industry if we can only open up true communication and not be told the topic, whatever it may be, "doesn't have time on the agenda" for grass roots discussion, or that there's "no comment", or that you don't have "right of reply" etc.

Our industry, like many others, is very much manipulated by our bigger brothers in Government, Banks, Finance Companies, Chain Stores etc. and, dare I say it, MAF.

Which brings me to the reason I was asked to write an article for the NZ Beekeeper.

It came from a discussion with our man Mike at Conference. In the bar of course. After a handle or three, I approached this cigarette-wielding accented, large gentleman from the north end of the globe with some not too praiseful comments on the content of the said NZ Beekeeping journal.

After another handle or three, Mike made the valuable comment that the general direction the editor took was directed to a fair degree by, believe it or not, the NBA.

Now, you may ask: "What do a bunch of beekeepers know about magazines?"

Apart from the continual financial burden from lack of honey for sale, or lack of sale for honey, or insufficient prices for our honey pollen etc., I feel well satisfied with my involvement with the bees and the industry that I must make the following comment:

- It may not be an easy industry in which to make heaps

of money, but it sure is one where you can have a great lifestyle. After all, is that not what life is all about anyway?

- All work and no play, makes Jack a dull boy.

To dispel any gossip, look on through the pages, and you will read my advert. I assure my many customers that I am still very much involved in our industry.

Here in the Waikato and, I believe, in most fertile areas of NZ land use has bought about change and with it comes change to the beekeeping fraternity. It is I believe very important to realise this change and move ahead with it.

I see in our marketing area the very real need of keeping ahead of the trends.

Maybe time has arrived where a central marketing office could handle all sales of honey for both local and export markets?

A small individualistic industry such as ours requires, I believe, a formal front door to the market place, be it local or overseas.

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Viruses of New Zealand Honey Bees

By Dr Denis Anderson,
DSIR Entomology Division,
Auckland

Most New Zealand beekeepers have at some time experienced sacbrood and paralysis disease in their colonies. Sacbrood, a disease of larvae caused by sacbrood virus, and paralysis, a disease of adult worker bees caused by chronic bee paralysis virus, may occasionally cause severe mortality in infected colonies. As well as sacbrood virus and chronic bee paralysis virus, there have been about 13 other viruses isolated from honey bees in other countries. Virtually nothing is known about their life cycles or their economic significance. Most are thought to persist in colonies as inapparent infections: that is, the bees appear to be healthy even though they can be shown to be infected with viruses when special techniques are used.

Virus diseases are generally regarded as less damaging to bee colonies than American foulbrood (AFB), a disease of larvae caused by a bacterium, *Bacillus larvae*, or *Nosema* disease caused by a micro-organism called a microsporidian. Nevertheless, the results from recent research are beginning to show the impact that a virus disease, such as sacbrood, has upon a colony. It is now becoming clear that the reduction in honey production that sacbrood may cause by infrequently killing many larvae may be less than the losses caused by sacbrood

virus infections that cause no physical symptoms.

Viruses reproduce (or replicate) differently than bacteria and other micro-organisms and as we learn more about viruses we increase the likelihood of finding methods for controlling them. In this short article I will describe general aspects that are common to the life cycle of most insect viruses before discussing two viruses, sacbrood virus and Kashmir bee virus, which I have recently found in New Zealand honey bees. In a later issue of the New Zealand beekeeper I will discuss two others, chronic bee paralysis and black queen cell viruses, which I have also recently found in New Zealand.

Virus diseases are not new to insects and have probably existed in them as long as virus diseases of other animals. The particles of different insect viruses may have a distinctive shape and size. However, the particles of sacbrood and Kashmir bee viruses are identical in shape and size (see Figure 1) but can readily be distinguished by special laboratory tests.

Viruses are some of the smallest micro-organisms known and most can only be seen when highly magnified by an electron microscope. The small size of viruses consequently means that their structure is relatively simple. The simplest virus particle consists of just a

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Viruses of NZ Honey Bees, cont.

strand of genetic material surrounded by a coat of protein. A virus particle can only reproduce inside a living cell and relies on the machinery within that cell to make copies of itself (i.e. to replicate). Hence all virus particles are parasitic. Some virus particles grow only in cells of a particular type while others may be able to infect several types. An infected cell will continue to produce virus particles until the cell eventually bursts (lyses) to release thousands of virus particles which may infect neighbouring cells and so continue the cycle.

Sacbrood Virus

Sacbrood has been reported in most countries where honey bees are present. More is known about the virus that causes this disease than any other.

Two-day-old worker larvae are most susceptible to sacbrood. They become infected after eating contaminated honey or 'royal jelly', a secretion produced in certain glands (hypopharyngeal and mandibular) of young nurse bees after they have eaten contaminated pollen collected by infected, foraging bees.

Newly infected larvae continue to eat and grow normally until shortly after being sealed in their cells, whereupon they fail to pupate and remain stretched on their backs with their heads pointing towards the cell capping. The unshed, final larval skin becomes a transparent sac and fluid accumulates between this and the body of diseased larvae. Then, beginning at the head and spreading towards the rear, their body colour gradually changes from pearly white to pale yellow. Shortly afterwards, they die.

Even though a larva with sacbrood contains enough virus to infect every larva from more than 1,000 colonies, in most colonies sacbrood remains slight. This probably is due in part to two inherited behavioural traits that enable worker bees to overcome the severity of the disease. One of these traits is that larvae, in the early stages of infection, are removed from the colony by nurse bees before they produce large concentrations of virus particles. The other is that nurse bees do not remove dead larvae until at least three weeks after they have died, when the virus particles in them are no longer infectious.

When either of these strategies fails, nurse bees become infected while cleaning the hive. Even then, the spread of virus appears to be restricted by subtle, virus-induced, changes in the behaviour of infected nurse bees. They cease to eat pollen, to attend the queen or drones, or to rear brood. They are more susceptible to chilling and try to fly and forage sooner. However, most infected foraging bees collect nectar, not pollen. The few infected bees that do collect pollen contaminate their loads with virus by way of glandular secretions that are added to the pollen loads. However, the behavioural patterns still limit the spread of the disease.

Recent research has also shown that larvae may become inapparently infected when fed smaller amounts of virus than is needed to cause sacbrood disease. These larvae then become inapparently infected workers but their fate is not known. However, if they behave in the same way as nurse bees who become inapparently

infected when cleaning out cells, the effect of sacbrood on a colony could be very significant.

Sacbrood virus is thought to persist from year to year in adult worker bees, in which virus multiplies without causing symptoms. Outbreaks of sacbrood are common during the spring build-up or prolonged drought when there is often a shortage of young workers to attend developing larvae. Therefore older, and perhaps infected, worker bees often assume rearing duties. This increases the likelihood of developing larvae contacting infected adults. During late spring and summer, when the division of labour in a colony is well established, the incidence of sacbrood decreases. Sacbrood also may be transmitted between colonies by robber or 'drifting' bees.

Kashmir bee virus

Very little is known about this virus. It was first discovered by Dr L. Bailey at the Rothamsted Experimental Station, England, in extracts of dead Eastern hive bees (*Apis cerana*) which were sent from Kashmir. It has since been found in Australian honey bees (*A. mellifera*). The virus was originally thought to be unique to *A. cerana* and somehow passed to Australian honey bees. However, the virus may be present in honey bees worldwide, as I have recently found it in both New Zealand and Canadian honey bees. Bees from other



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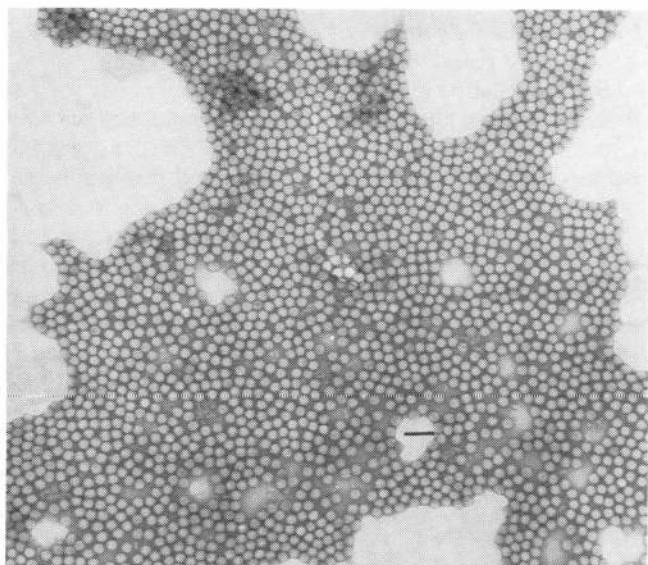
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Viruses of NZ Honey Bees, cont.



Sacbrood virus particles highly magnified by an electron microscope. The black bar = 100 nanometres.

countries are being examined at the present time to determine the extent of its distribution.

The reason why Kashmir bee virus has not been found in honey bees from the northern hemisphere previously is perhaps because the virus exists in colonies without causing symptoms. Recent research indicates that Kashmir bee virus is present in 'healthy' pupae and adult worker bees in most Australian honey bee colonies. No disease symptoms were observed when the virus was fed to young larvae. However, the virus readily established inapparent infections in them. In the laboratory, Kashmir bee virus grows and causes death when injected into bee pupae and adult worker bees but not when fed to them. These results suggest that the virus exists in nature as an inapparent infection of the bee gut and does not normally harm the bees.

In the field, the virus appears to kill only when other primary bee pathogens are present. For example, in Australia, honey bees Kashmir bee virus is usually found in association with *Mellisococcus pluton*, the bacterium which causes European foulbrood (Hornitzky, Australasian Beekeeper, May, p261, 1981). In New Zealand, I have frequently detected Kashmir bee virus in association with *Bacillus larvae* (American foulbrood). These findings are consistent with the idea that Kashmir bee virus normally infects cells of the gut, where it appears to do little harm and goes unobserved. But following an infection of the gut by another primary pathogen, the virus may escape to other tissues and replicate to detectable levels.

Control of Virus

More research is needed before virus infections can be controlled. The presence of a virus in a colony can mean that the virus has merely adapted to the host defence mechanisms. In the honey bees, the defence system depends on the genetic make-up of the individual bees. A change in that make-up may result in bees which are less susceptible. However, in every virus population there

may be a few individual virus particles which are better adapted to the 'new' genetic make-up. These particles will eventually be selected until they become the major type, and because of their greater efficiency, the bees once again become highly susceptible. For this reason it has often been shown that colonies infected with virus diseases will recover after they have been requeened. We may therefore win a battle but the war goes on.



The flip side of a postcard used at a recent international conference of beekeepers in Sweden, and sent to The NZ Beekeeper by Dianna New through her father, Ernest New of Invercargill. A good idea for us to have something like it?

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The President's Report

JOINT MEETING

At our Executive Meeting held 9-10 Sept. 1985, the NBA Executive met three representatives from both the NZ Honey Producers Co-op and the NZ Honey Packers' Association. This was in response to the following remit from our 1985 Conference:

- "That the NBA Executive meets with the Co-op and the Packers' Association and that the three parties endeavour to formulate a common marketing policy"

Four hours of useful discussions were held under the Chairmanship of David Dobson. The following resolutions were passed:

1. That the NBA Executive Secretary co-ordinate an information and crop-forecasting service with the assistance of the Co-op, the Packers, and the MAF.
2. That a committee be charged to further investigate the market research opportunities, together with costs, and report back.

The Committee, now set up, consists of Dudley Ward, NBA; Peter Bray, Packers' Association; and John Nimmo, Co-op. It hopes to hold further meetings with different sections of the Industry and that the discussions will result in benefits to our Industry.

THE HONEY MARKET

Despite our strong dollar there has been keen competition by exporters for the remaining stocks of lighter grades of the 1985 crop. This demand is apparently due to a below-average crop in some Northern Hemisphere honey-producing countries and will mean stocks of honey carried forward into the new season will be quite low despite our record crop last year.

If, as seems likely, this export demand continues into the New Year, we must take care to ensure enough honey is retained in NZ to satisfy our domestic market and so avoid pressure to import foreign honey with its risks of disease.

INDUSTRIAL RAW SUGAR

Judging by the substantial quantities of this grade of sugar supplied by the NZ Sugar Co. to NBA members, more members are now taking advantage of this scheme to save in their feed-sugar costs.

HIVE LEVY INCREASE

Minister of Agriculture Colin Moyle has agreed to arrange an increase in the hive levy to 25 cents per hive for 1986. He does however express concern at the high rate of administration costs of the NBA.

1985 CONFERENCE

I feel sure everyone who attended the Greymouth Conference was impressed by the efforts of the West Coast Branch in hosting such a successful and enjoyable Conference. Financially the Conference was a bonanza. Even though the costs to members were less than the previous year the Seminar showed a profit of \$245.00, the Conference a profit of \$649.00, and the Branch a profit of \$574.00, and how did they manage this? West Coast Branch Secretary Daphne Feary has compiled 20

pages headed: "Conference Preparation and Organisation Notes". These should prove a great help to future host Branches.

Seasons Greetings to all!

Ian Berry

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Equipment

Easy Rider Takes On The Spring Work

By Mark Schrader

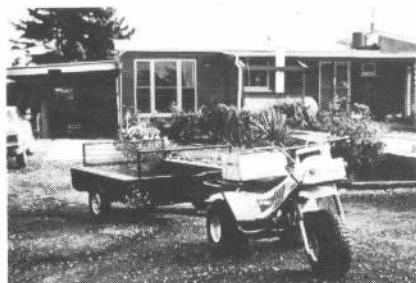
Eric Stevenson's childhood trike is long gone, but he's bought another — a real beaut. This year spring checks have cost him less, saved him time, and given him fun.

Mainland beekeepers won't need to think too far back to remember planting their truck's belly firmly into the mud. The all-too-familiar search for the farmer, half an hour spent starting the tractor, and an hour later . . . out . . . perhaps?

Each year a different paddock provides you with yet another "stuck in the mud" story.

Eric hasn't found a way to stop you sinking your truck, but is using an alternative which will prevent him from joining the cast sheep in the paddock. The two-stroke motorised trike has a tight turning circle, large mud-flinging balloon tyres, and is light: this makes it his ideal ticket for these trips. The trike is small, but so are his equipment requirements at this time of the year: a smoker, hivetool, and a hood veil.

Traditional square veils are not suitable for the trike. Eric's choice of the hood veil means that once it's unzipped, he can really see where he's going. A bonus with the veil back is the cool refreshing breeze generated as the trike trundles across the countryside.



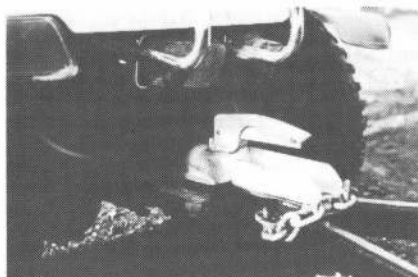
(1) Ready to go — trike with trailer in tow.

If you've ever ridden one of these three wheelers, you'll already know some of the special trike skills. Two quick tips: on the uphill, lean forward, otherwise you'll join Fred Dagg and it's over we go Trev as you tip over backwards.

Secondly, and a bit more difficult to do without actually riding a trike, is, when turning, lean the opposite

way to that which you would on a bicycle. This really is a trap for young players. Novices who dismount from a bike and leap onto a trike can, when negotiating their first corner, go head over heels and into the dyke. Seeing is believing!

Unlike a beekeeper's extracting gear, the trike isn't used for a couple of months and left idle. It has novel uses about the business and, like most things in beekeeping, its uses are restricted solely by your imagination. For instance, Eric designed a neat saw bench which is driven via a large band by the back wheels of the trike.

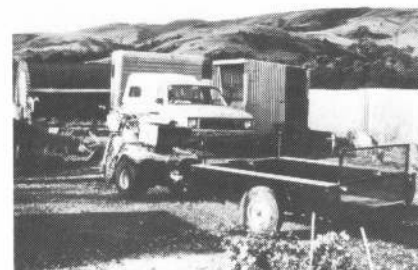


(2) The coupling between trike and trailer.

Now, how does he get out to the apiary? The answer is simple and cost him \$420 — a nifty trailer towed behind his ute. The trailer is well-designed and has a bulbous lip at the front to accommodate the trike's front wheel. This helps to keep the trike stable during towing. The steel grid deck was a good choice because it allows for easy sliding of boxes across its surface and with a couple of squirts from the high pressure hose, it's clean. It's large enough to transport six hives (if you take the trike out) but can take half that number by inserting a sliding steel bar down about amidships. This will stop the hives or boxes launching into one another during transport.

It seemed a bit silly to restrict the trailer's use to the ute, so on to the trike went the tow-bar and out went the loaded trailer tucked in behind the trike; off to visit those out apiaries.

The trike was "a bit of a snip" (you know, a friend of a friend . . .!) but given the present trend by cockies to move to quadikes (?) (four-wheeled



(3) Trailer and trike. N.B. The bulbous lip at the front of the trailer for the trike's front wheel.

minitractors), trikes should not be too difficult to pick up. What's more, they should be cheap.

Eric's a bit like one of those credit cardholding turkeys on TV except with him it's his trike — he doesn't leave home without it. Worth a thought, isn't it?



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Beekeeping Monitoring Part II

By Trevor G. Bryant, AAO, MAF, Tauranga

For the benefit of beekeepers not currently involved, the information gathered is put into the MAF computer and a cash flow spread sheet giving forecasts and actual figures is provided for the beekeeper.

From these computer printouts all the figures are used to work out the district 'model' of each operation. These figures are not necessarily averages as each operation may have something peculiar to it and such variables are removed but noted. Usually breaking each item of expenditure down to \$ per hive will give a very representative picture with surprisingly little variation between operations.

Cash items which do vary considerably are — personal, financial charges, capital and development expenses, and very obviously income.

A summary of financial data from Tauranga since 1983 with the 1983 Gore figures is shown in Table 1.

TABLE 1: Tauranga Financial Summary 1983-85 with forecast for 1986. Gore in parenthesis.

Year	1983	1984	1985	1986	
Beekeeping income	(8537)	68550	79643	118140	136860
Beekeeping expenses	(18867)	30480	41231	57403	72142
Beekeeping net income	(-10330)	38070	38408	60737	64718
Less drawings, taxation					
financial charges	(11485)	24825	22392	34718	43089
Surplus for ploughback	(-21815)	13245	16016	26019	21629
Less development and					
capital purchases	(-)	12500	15000	15921	11600
Plus new borrowings	(25000)	10000	5250	16000	
CASH SURPLUS:	(3185)	10745	6266	26098	10029
PRODUCTION HIVES:	(725)	750	860	1150	1250

An analysis of the figures in Table 1 shows that cash expenses per hive have risen each year; 18% 1983/84, 4% 1984/85, and a forecast of 15% for 1986. Incomes rose 1% in 1984, 10% in 1985, forecast of 7% for 1986.

Trends not shown in the summarised figures but recorded in the accompanying note are: that personal expenses in Tauranga have increased 59% in two years, taxation by 1100% and equipment on average 45%. Vehicle expenses, while being one of the major costs, rose by only 9% in the same period despite petrol/road user charges increases. This can be attributed to better, more efficient vehicles now being operated by the beekeeper and efficiencies of size and management, and in the case of personal expenses, a wish to lift their standard of living and reward themselves and families after years of hard work. It has also helped reduce the overall taxation commitment.

Table II is the complete results for 1985 with the forecast for 1985/86 season. From this the influence of pollination is of note but to truly appreciate this form of

income it must be realised that it goes into the bank at a time of the year when those reliant on honey are feeling the pinch.

Pollination fees are a guaranteed form of income, providing you can retain your clients and obtain the necessary contracts. This 'guaranteed' income has enabled beekeepers to make greater use of short term finance, reduced seasonal overdrafts and made long term finance much more obtainable.

The amount of cash being handled by beekeepers is not without its problems however. They have of necessity had to become much more business-like in their approach to beekeeping, more bookwork is required, they now have to deal with a small percentage of bad debts. Good public relations and time spent with clients or users of their service is essential if beekeepers wish to maintain their clients' confidence and business.

These 'burdens' to some beekeepers have placed strains and stress on family life as suddenly beekeeping is no longer a 'way of life'; others however thrive on it.



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Beekeeping Monitoring (cont.)

TABLE II:
Tauranga Apiary District Date: 2.5.85
Established Commercial Beekeeper:
 PHYSICAL DETAILS RELATING TO PRODUCTION

Total hives	1150	Spring	1984	920
Total producing hives	1080	Autumn	1985	1346
Servicing rounds /season	10.2			
Vehicle mileage:				
Truck	17735			
Utility	8255			
Total kilometres	25990			
Km /hive	22.6			

SUMMARY OF OPERATION:
PRODUCTION

Honey production (tonnes)	Actual	Projected	Price / tonne
Bulk : local	23	25	\$1557
: export			
Packed : local	7.6	8	\$2249
: export			
Comb : local			/doz
: export	446	450	\$26 /doz
Wax (kg)		250	\$6 /kg
Pollen			
Pollination (no sets)	754 \$65 /set	860	\$71 /set
Other			

TOTAL HONEY (t /100) 2.87 2.58

EXPENSES SUMMARY

Crop:	Actual	Projected
Sugar /t	3019 2.63 /hive	8211 6.10 /hive
Queens 6.25 each	2509 2.18 /hive	2019 1.50 /hive
Fencing		
Chemicals	167	240
Foundation /carton	463	675
Clothing	380	410

Wages:

Permanent /hr	14448 12.56 /hive	18500 13.74 /hive
Casual \$5.60 /hr	3548 3.09 /hive	4200 3.12 /hive

Processing /Marketing:

Drums	228	360
Packaging /kg	4285	5250
Honey Purchased 1.75 /t	2820	
Electricity	965	1351
Fumigation	165	201
Freight	1397	1606
Advertising	388	520

Contract Extraction /box		/hive	/hive
--------------------------	--	-------	-------

Comb honey charges	826	920
Commissions	565	610

Vehicle Expenses: 9463 8.23 /hive 12181 9.05 /hive

Repairs & Maintenance:

Hives	2990 2.60 /hive	4240 3.15 /hive
Other	2068	2800

Administration, Levies: 2808 3400

Insurances: 781 860

Other: (Specify) 3120 3588

Farm Protein

TOTAL EXPENSES: 57403 49.92/hive 72142 53.60/hive

INCOME SUMMARY

Honey:

Bulk : local	35800	38000
--------------	-------	-------

: export

Packed : local	17091	18500
: export		
Comb : local		
: export	11600	12600

Wax: 1500

Pollen:

Pollination: 49047 61060

Other: (Specify) 4602 5200

Farm, contract ex nucs, rent

TOTAL INCOME: 118140 102.73 /hive 136860 101.68 /hive

FINANCIAL SUMMARY

Total Income **Actual** 118140 **Projected** 136860

Less Expenses 57403 72142

OPERATING SURPLUS: 60737 52.82 /hive 64718 48.08 /hive

LESS:

Personal expenses 14510 17500

Taxation 5610 6150

Principal Repayments 4472 5250

Financial charges 10126 8.81 /hive 14189 10.54 /hive

SURPLUS FOR PLOUGHBACK: 26019 22.63 /hive 21629 16.07 /hive

LESS:

Development 7100 5400

Capital purchases 8821 6200

PLUS:

New Borrowing 16000 13.91 /hive /hive

CASH SURPLUS: 26098 10029

SUMMARY OF CAPITAL

Land & buildings 161000

Hives 128800

Plant & machinery 24000

Vehicles 31000

Stock 10500

Farm 6100

TOTAL CAPITAL 361400 314.26 /hive

Less Liabilities: 136000 118.26 /hive

Nett Worth: 225400 196.00 /hive

Internal Rate Return:

Operating Surplus: 60737

Less operators labour*: 13754 46983 Return on Equity Capital

Return on Equity Capital /Net Worth = 20.84 % Rate of Return.

* Operators labour equals award wage equivalent plus 1 % of net worth.

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Recent Research Into Half-Moon Disorder In Honey Bees

By Andrew Matheson, AAO, MAF, Nelson

Recent research is beginning to throw some light on a disorder of honey bee brood that has been called "half-moon disorder" or HMD. This is an unusual condition of brood, with an unknown cause. The disorder is widespread in New Zealand, but at very low levels. Beekeepers do not consider it a problem.

Symptoms of HMD are:

- Larvae die mainly at the four-day-old stage, when they are uncapped and lie in a "C" shape in the cell.
- Dead larvae turn cream-yellow and may coil half way up the cell or around its mouth, rather than in their normal position at the base of the cell.
- The air tubes or tracheae become quite conspicuous.
- Ultimately the remains dry out to a mottled dark-brown scale which lies in a half-moon or crescent shape around the mouth of the cell.
- The larvae retain their segmentation, and their body contents are not ropey.
- Some larvae die after they have stretched out along the length of the cell. These may spiral up the wall of the cell in an unnatural position.

Dr H. Shimanuki of the US Dept of Agriculture worked in New Zealand for six weeks in 1984. One of the reasons for his visit was to work with fresh specimens of HMD, and some of his findings were presented in August at an invertebrate pathology symposium in Ontario, Canada. Dr Shimanuki won't call HMD a disease, as no organism has yet been shown to cause it. He calls it "half-moon syndrome" (HMS), rather than a disorder.

He comments that:

- Transferring brood combs containing dead larvae (cadavers) failed to establish HMS in other, small colonies.
- Requeening often resulted in disappearance of the symptoms of the syndrome.

Shimanuki and a co-worker then tried to isolate bacteria from cadavers, and found one which they identified tentatively as *Bacillus coagulans*. When a million colony-forming units of *B. coagulans* were fed to one-day old larvae, about 60% died. Those displaying the syndrome died within one-four days after inoculation and were curled in their cells. In some cases a brown scale formed. It wasn't possible to kill two-day or three-day larvae in this way, though the bacteria could later be isolated from their gut contents and faeces.

B. coagulans has so far also been found in:

- Adult worker bees in Egypt and the United States.
- Adult queen bees in the United States.
- Gypsy moth larvae in the United States.

It is still not certain that *B. coagulans* is the cause of HMS/HMD, though it is interesting to see that the

bacterium is present in bees in other countries.

In any case, perhaps the same syndrome is found in other countries under different names (eg Victoria disease or X disease), or is masked by the presence of diseases like European foulbrood. It responds to oxytetracyclines, so it may not be obvious where these drugs are being fed.

References:

Gilliam, M.; Valentine, D.K. 1976. Bacteria isolated from the intestinal contents of foraging worker honey bees, *Apis Mellifera*; the genus *Bacillus*. *Journal of Invertebrate Pathology* 28:275-276

Vandenberg, J.D.; Shimanuki, H. 1985. Isolation and characterization of a *Bacillus*, species from larvae of the honey bee, *Apis mellifera*, suffering from half-moon syndrome. *Proceedings of the Society for Invertebrate Pathology 18th annual meeting, Ontario Canada, August 1985* (in press).



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Certificate In Beekeeping

The Bay of Plenty Community College, in conjunction with the National Beekeepers Association, is pleased to announce that enrolments will now be accepted for the following course prepared by the College:

CERTIFICATE IN BEEKEEPING

This course is a two-year programme based on self-study of written material and attendance at short courses. It is intended to provide a structure of study in beekeeping primarily for those with commercial intentions.

It is a structured reading programme to broaden both your knowledge and appreciation of bees and beekeeping. It is not intended to teach you how to keep bees; its intended more to supplement what you learn in your day-to-day beekeeping, to help you to know why you do things you do.

Self-employed beekeepers just starting out, sideline beekeepers, and employees of beekeepers will all find the course of value.

Minimum entry requirements are that you be at least 18 years of age and have at least one year full-time beekeeping experience or two years of part-time experience that could be equated to full time. The course consists of 10 written modules and two short courses, as follows:

Introductory Module — This initial module has been prepared to give the student an overview of the work to come, including a discussion about the best ways to study, list of books, information about access to libraries, and a questionnaire to assist the tutor in ensuring that the student gets out of the course what is intended.

Module One — Hive Management — History of beekeeping. Beekeeping in New Zealand. Regulations effecting beekeeping. Basic management for honey production. Bee stings and allergies.

Module Two — Entomology — Classification of insects. Social behaviour in insects. The three castes of the honey bee. Sensory perception.

Module Three — Hive Equipment — The concept of the bee space. Basic hive equipment. Preserving beehive equipment. Ancillary equipment.

Module Four — Apicultural Botany — Plant biology. Nectar, pollen and honeydew producing plants. Honey and honeydew poisonous to bees and to people.

Module Five — Colony Behaviour — Division of labour in the colony. Activities of the worker bee. Communication among bees. Pheromones. Queen rearing impulses.

Module Six — Hive Manipulations — A two-day short course covering topics related to practical beekeeping. Swarm prevention, feeding, requeening, shifting bees, wintering hives.

Module Seven — Pollination and Agricultural Chemicals — Importance of bees as pollinating agents. Crops needing or benefitting from insect visitation. Mechanics

of pollination. Management of hives for pollination. Agricultural chemicals.

Module Eight — Diseases and Pests — Diseases and pests affecting bees in New Zealand. Diseases and pests of bees that are not present in New Zealand. Importations of bees and equipment. Other pests that attack the colony or combs.

Module Nine — Honey Harvesting and Handling — Vehicles for beekeepers. Taking honey off the hives. Extraction plant and process. Food hygiene regulations.

Module Ten — Packaging and Marketing of Hive Products — Honey marketing. Quality control. Packaging. Other hive products.

Module Eleven — Business Administration — Beekeeping organisations and advisors. Budgets and cash flow forecasts. Loan procedures. Taxation.

Module Twelve — Queen Rearing — A two-day short course dealing with queen rearing theory and practice.

The written modules include required reading from *The Hive and the Honey Bee*. It is suggested that each student obtain a copy of this book from one of the bee equipment suppliers.

The two short courses will be held in a number of venues around the country, in conjunction with a Community College, Polytechnic, or Technical Institute.

Students are required to complete the first five written modules before attending the short courses held in September and October. In order to complete the written modules before attendance at the short courses, students are advised to enrol early in the school year.

Students will also be required to visit selected beekeepers who are members of the National Beekeepers' Association in order to have an oral and practical examination at the end of each year of the course.

There will be no formal written examinations at the end of the course, though there will be a written test during the two-day short courses. Students will be assessed on the answers to study questions at the end of each written module.

The course has been accepted for validation by the Authority of Advanced Vocational Awards. At the completion, you will receive a certificate issued by the National Beekeepers' Association, validated to the Ordinary National Certificate level by AAVA.

Course fees have not been finalised for the coming year, but should be less than \$100.00 for each year of the course. This entitles the student to all the written module material, attendance at all short courses, and material provided there.

To obtain a registration form, or seek more information, please contact:

Certificate in Beekeeping
Bay of Plenty Community College
Private Bag
RD 3
TAURANGA



From the colonies

OTAGO

It is with great regret that we report the passing of Charlie Foote, Life Member of our Branch, and well-known to many outside Otago. As you may have read from our Branch notes in the spring issue, Mrs Foote preceded Charlie by just a few months. Our thoughts go out to their son and daughter. John is our secretary and he certainly has had a most difficult time and is faced now with many problems and a mountain of work.

Going in and out of the paddocks has been a dream this spring. I would not think it possible that any Otago beekeeper has been able to get his truck stuck. It really is still very dry in many places. However Labour weekend has been cold with some rain, hail, and snow. Perhaps not enough but it all helps. One of our cockies further inland towards Middlemarch has had no need to cut his lawn since Boxing Day 1984.

A Spring field day, held in Alexandra, was well attended. Subjects for the day were bee diseases and the coming implications of GST. Russel Poole, accountant-beekeeper-HMA chairman, well known to many in our

industry, very capably explained much about the new tax as it will affect beekeepers.

Some demonstrations were given and Ernest Adamson's nearby honey-house at Earnsclough was open for inspection.

John Heineman

NORTH OTAGO

A meeting-cum-field day, held at the honey house of Bill Irving, Kurow, just prior to the honey flow, was well attended by local beekeepers. Despite the poor season last year because of the drought, and the continuing drought, there was certainly no gloom or doom shown. Everyone hopes for a better season this year. The poor season last year meant that much more sugar was used, but as we all know there is no profit in a dead hive. In the general discussion it was felt that, with the exception of any new areas that might be opened up, there was and is more than sufficient hives to gather the available crop. Any extra hives would be capital outlay that would not be

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From The Colonies, cont.

economic. We should endeavour to increase production from existing hives and look for better prices for our product.

George Winslade

SOUTH AUCKLAND

As a result of a mild winter and a lot of brood rearing by the bees much sugar has had to be fed to keep the little beasties from starving. This spring has given us some very fine days with high temperatures, and what happens when the bees start rearing brood in earnest? We get about three nights of frost which produces dead bees around the hive!

How time passes! In about 19 days, or about the time you read this, we should be working at night shifting bees into kiwifruit.

At present there is quite a nectar flow from buttercup and barberry. The barberry flow is patchy compared with last year, although it seems to be producing the nectar. The question now is: how will the honey season go? If it is above average will we be able to export honey given the high rate of exchange?

Dave Young

SOUTHLAND

Well, spring here (Waikaka) lived up to its promise. Good bee weather. Little wind with plenty of sunny days

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whilst the rainfall for the three months to November 2 averaged 67.5mm per month. The countryside consequently is looking well with trees and shrubs showing early bloom although we had a couple of late 6° frosts.

Arrangements are in hand for our Annual Field Day which will be held on February 1 at Mr J. McDonald's place at Five Rivers: approximately 86km from Frankton and 14km from Lumsden. We are hopeful that one of the speakers may be a honey buyer from West Germany currently expected around that time. We look forward to seeing some of you at Five Rivers.

Russell Rhodes

NELSON

In their endearing but perverse way our colonies invariably manage to get one step ahead of us. It is said that: "Time waits for no man". How true this rings in matters of nature. No sooner does spring breathe on us, then we're checking stores, setting up for cell-raising, making splits, when — Hey Presto—swarms are on us and before this goes to press pollination for 1985 will be history — except for the cheque through the mail.

As the kiwifruit acreage increases and the vines mature, many of our members are becoming pollinators rather than honey producers. In this economic climate the skills of preparing honey-producing hives are being overshadowed by the manipulations aimed at producing the IDEAL pollinating unit.

As can be expected the IDEAL needs focusing and clarifying. So what better topic for a practical field day? Mr & Mrs Rex Bolwell kindly provided the venue and goodies at their home. A variety of hives provided the entertainment and chastisement, while Andrew Matheson, our AAO, set the scene and the traps. The imagination needs little stirring to picture the scene: a score or more gallant warriors in teams of four taking turns at demolishing that number of hives. Bees can perform miracles in house-repair jobs but not quite that fast.

But all for a good cause, and now the interpretation of IDEA has been regulated. The chief criteria are: the surface area of brood, the degree of occupied bee space, and of course elbow room for Her Majesty.

Having recovered from our Christmas function at the Boulevard, Richmond, December 11, we shall hopefully be hosting our friends from the Marlborough and Wellington branches over the weekend of January 24-26 at the Rotoiti Lodge. A great spot! The best of company! Someone else will wash up this time! I'm quite looking forward to it.

Fred Galea

WESTLAND

Glancing back over our Branch Notes for autumn and winter it is noteworthy to realise that the weather, which plays such an important roll in our beekeeping endeavours, has been exceptionally good since last February. No extended periods of wet weather to contend with, both physically and mentally, has surely lifted the horizon of our optimism considerably.

Spring, apart from a couple of short rough patches,

From The Colonies, cont.

has been excellent . . . one of the best in years. Just the ability to get out and work the hives at will is a real treat. You can even plan a work programme!!

Apart from the beekeeper's moral, this favourable weather has, of course, treated the bees kindly, much to their liking, and the result is in the hives themselves . . . good populations, adequate pollen, and well-nourished bees and brood. What a contrast to many of our past springs!

Understandably, stores of honey were consumed more rapidly than normal and so sugar-feeding resulted with a higher usage than expected. But the results are pleasing, and if the weather remains settled for the next two months, November and December, we should have an average or better crop.

Members this spring have been keeping a low profile, head and shoulders bent over their hives. Consequently, little social contact has resulted, but they will surface one day, hopefully with smiling faces.

In the meantime there's a pair of gumboots for sale. Ah well, maybe just for hire.

Sandy Richardson

SOUTH WESTERN DISTRICTS

Seventy people, a warm and calm October Saturday,

and a backdrop of native bush — that was the scene for a most successful field day at Gary Tweedale's apiary at Whangaehu, near Wanganui.

Coming from far and near we were all introduced to our new apiary advisor, Ted Roberts (formerly on the Massey University staff). Gary Tweedale showed us his method of taking off nuclei above a queen excluder from strong hives. Preparation of hives for kiwifruit pollination and honey production were also feature topics of the day.

September and October weather has been excellent for bees. One or two degrees warmer than usual and perfect to catch the willow flow.

Our stronger colonies have required more frequent supplementary feeding. Everyone is pleased with the industrial grade raw sugar and deliveries have been prompt.

Only two short rough spells of weather during our spring have caused concern — not to the bees but to the kiwifruit growers. Frosts, hail, and strong winds hit some orchards causing enough damage to reduce their beehive pollination requirements.

Our NBA Branch has adopted a pollination protection agreement patterned on the one used by Northland beekeepers. My checklist, which includes an appraisal of pasture composition and hive strength, points to readiness for another good honey crop.

John Brandon

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From The Colonies, cont.

HAWKES BAY

Last months' meeting saw both Ted Roberts, our new AAO, and Murray Reid present.

Murray told us of MAF cutbacks and its new policy of covering costs by passing them on. Ted gave us his background and qualifications, then outlined his goals and objectives for his first year.

The Hawkes Bay spring has been dry with warmer than normal temperatures earlier. However, we had two late snowfalls to make up for it, and right on manuka flowering time.

Pollination time has come and gone again with its usual array of problems. One of our members has been doing pollen-collecting experiments on kiwifruit in conjunction with MAF. It has been an annual event over the past three seasons. This year the results have been analysed with the two-shift pollination method and proved successful. This method involves taking 50% of the hives required into the kiwis at 20% flowering followed four days later by the other 50% of hives.

Our Branch now has a monthly newsletter which is posted to all members. It notifies everyone of our next meeting and gives a summary of the previous meeting, plus useful information, recipes, and "For Sale" and "Wanted to Buy" ads. Michael Jeeves is the new editor as Dean Compton has headed overseas. If you have any useful hints or information please get in touch with Michael.

Here's hoping Hawkes Bay has a good crop. See you all in March.

John Walker

WAIKATO

The Waikato experienced a very mild winter with very few frosts and little rough weather. The middle of September brought a change and we had to cope with a very unusual period of extremely cold gusty winds and showers ranging from east to north for several weeks. There was then a change to SWW with very cold, gusty winds and showers again.

About this time of year beekeepers go through a form of purgatory, setting bars of queen cells, trying to split

hives, as well as all hives needing regular feeding. Working alone as I do, it's a very stressful time.

The bad weather continued up to November 5 but from then until the time of writing we have been having warm fine days and the pastures are now showing masses of yellow buttercup flowers and the bees are pouring the nectar in and are starting to build up nicely. Young queens are mating and starting to lay. I began to think they would become geriatric before the weather came right.

There is still a lot of honey unsold in the Waikato although I am told it should all be moved by Christmas. There have been several large containers exported recently at reasonable prices.

Members should pay attention to maintaining friendly, helpful relations with farm owners. I have been told of an instance where a farmer went to put his milking herd into a paddock in which a beekeeper had hives, but found he could not get the cows through because there were 100 or so hives spread about the paddock. The beekeeper concerned was using the paddock as a staging post for kiwifruit pollination hives. The farmer, needless to say, was not at all happy.

The season looks like being a long one. It would be a good idea to put a well-graded crop into export quality drums so it can be sent overseas without further processing.

Seasons Greetings and best wishes for that bumper season we all hope for every year!!

Ray Robinson

POVERTY BAY

Hives in this area wintered very well because of the mild, warm winter. Come spring a big surprise was in store with the willow producing a good, strong flow. Hives located near this moved ahead and stored much nectar. Since then, as I write this, the weather has been unsettled and nectar sources, such as citrus, have not yielded. Unless the weather warms up and becomes more settled we could be in for a poor season.

Kiwifruit pollination is only two weeks away, so local beekeepers are busy preparing for this annual event.

A good three-day field day was organised by the MAF for the Poverty Bay beekeepers to travel over to the Bay of Plenty to meet and talk with commercial beekeepers there. Much knowledge was exchanged and the trip proved to be a valuable experience. Many thanks to those who organised it and for the hospitality of the Bay of Plenty beekeepers. We look forward to seeing them all in Poverty Bay in summer when a return trip is planned.

Let's hope the weather warms up soon.

Peter Lamb

SOUTH CANTERBURY

"A good willow flow, a poor honey crop" so goes a local saying. We have had the best willow flow for many years, and now the worst drought so we live in hope that the old theory falls down.

As I write, rain is quietly falling but we do require 75-100mm now to set things right.

Bees came out of winter in very good condition and

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From The Colonies, cont.

with the good willow flow have plenty of stores. We just want that rain and everyone down here will be happy.

Queen mating has been normal (80-90%) this spring. It can be attributed to fine, warm weather with little wind.

Branch activities have continued around the usual meeting to report Conference business, and we have had a meeting with Inland Revenue officers to discuss GST. Those present realise just what will be involved and how complicated record-keeping will be.

To me, an old-timer in the industry, it is interesting to note the changes in the local beekeeping scene. Tailgate loaders, "Hiat"-type cranes, and now a "Bobcat" has arrived. No more hand yacker to load honey or hives.

Several beekeepers have begun palleting hives for fast moving to promising areas or into the high country. Autumn re-queening with two-three day old queen cells is becoming the norm. This, together with contracted extracting and improved extracting plants, is allowing more hives to be operated per man hour and with greater efficiency.

It is interesting to look back at production figures for this district. The quantity of honey produced is increasing substantially each year. Much of this is because of increased efficiency.

Harry Cloake

NORTHLAND

At the time of writing the honey flow has just started and we all look forward to better things. The far north

honey flow was just about a washout. Weatherwise, we have had one of the most difficult springs for many years with strong winds and rain to go with it. Hives were strong early but have used larger amounts of feed and more sugar than usual has been fed in the area so far.

The Northland Pollinators Assn organised seminars with the fruitgrowers in Kerikeri and Whangarei late September. The aim was to let the fruitgrowers see what is involved in setting up pollination hives. Members and MAF officers spoke on different aspects of pollination and the problems that can arise. It certainly opened the eyes of the fruitgrowers who attended.

Merry Christmas to all.

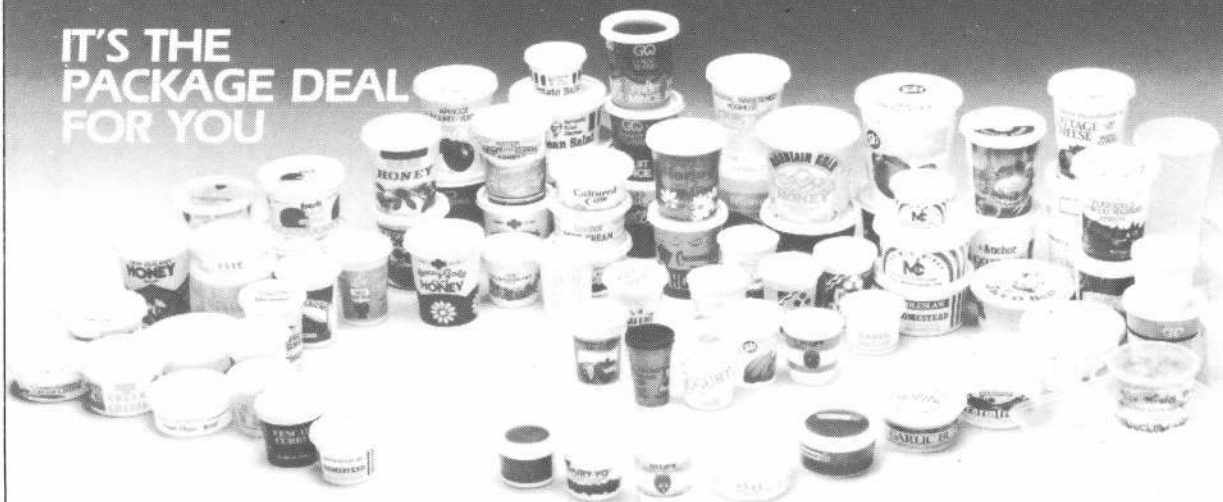
Pat Gavin



You've heard the Biblical story of Christ turning water into wine. Well, here are two Waikato beekeepers turning wine into honey!

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Supering Up Your Hives

By Skep

“Putting supers on the hive? What’s the problem with that? You just wait until the honey flow starts and put them on when the hive needs them.”

That makes it sound very simple, doesn't it? In fact, there are quite a few fine points to adding supers to hives that I want to cover in this article. None of them will take the place of adequate spring preparation of the colony, but then beekeeping can never be reduced to only one or two procedures. Your crop at the end of the season is a result of a whole series of activities (and luck!) that must be closely observed. Supering up is just one of these.

Some beekeepers who do not use queen excluders actually use their supering up to take the place of the excluder. Assuming that you are using two boxes for the brood chamber, putting on the third box at the right time can serve to keep the queen down in the bottom without using an excluder.

If you super too early, before the bees have brought in enough nectar to serve as a 'barrier' across the tops of the combs in the second box, the queen may very well move up into the third box. If you super too late, the bees will have packed out the brood nest with honey and forced the queen into cutting back her egg laying. Putting

on the super at just the right time gives the desired results.

Personally, I don't feel very confident in doing this. I prefer the surety that a queen excluder gives me. When it's on, I know where the queen is.

Most beekeepers wait until the honey flow is underway or just before to add a third box. For a beginner, though, this decision may be hard to make. One clue to look for is the storage of fresh nectar in the brood nest area, nectar which can be easily shaken from the comb. Another is the presence of fresh wax, often just small small flecks of white that appear on the top bars and other places on the comb. This shows that the honey flow is well enough advanced that the bees have begun to secrete wax and start comb building.

Another helpful hint comes through the use of 'bait' frames. Back in early comb-honey production beekeepers found that it helped to lure the bees up into the supers by using partly-drawn sections saved from the previous year. If you are using drawn combs and have a moderate honey flow, it may not be a problem, but if you are adding a full box of foundation, you may find the bees unwilling to move up into it to start working. If this is the case, you

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Beginners' Notes, cont.

can lift one of the outside frames from the brood nest into the added super. Since the bees are already working on this, they continue, and then work naturally in the adjoining frames.

Beekeepers disagree over one other area of supering with foundation. Some prefer to get the combs drawn 10 to the box, while others prefer to mix in sheets of foundation into boxes containing drawn combs. Whichever method you use, be careful when you place foundation to the outside of the box. Not only will the bees often not draw it out, but when they do, it may be attached with brace comb to the side of the box.

A very interesting finding by some American beekeeping researchers is that the presence of empty comb actually stimulates the bees to gather more honey. This bit of information came as a sidelight to other work relating to selection of breeder queens. It appeared that in the lab, working with small 'hoarding' cages with 50 bees, the bees stored sugar syrup more quickly if they had more comb area available. The researchers then tried it under field conditions. Using 20 hives, they supered half in the normal manner, just adding boxes as they were needed. The other half of the hives were given a whole stack of supers at the beginning of the flow and left.

Lo and behold, the second group gathered significantly more honey. Just to prove the point, they took off the honey, reversed the experimental groupings and took them to another area whose honey flow was just beginning. Again, the group with plenty of storage area collected more honey.

Now before you rush out and stack all your hives up, let me qualify that. Both of the honey flows were quite strong. In an area where the flow was not so heavy, you'd probably end up with half filled combs and boxes which would be a lot of trouble to extract. As the experimenters wrote:

"... beekeepers who have practiced restriction of super space in an effort to crowd the honey crop into a minimum number of well-filled combs might profitably experiment with supplying extra comb space during promising nectar flows."

And as another caution, the same researchers carried the idea to an extreme to see what happened and found that really large amounts of empty comb area, six to eight empty supers, resulted in a smaller crop. If you want a 'human' interpretation of it, I too would be discouraged with all that empty comb area and the expectation that it needs to be filled!

Once the first honey super is on and the bees are working hard to fill it, when should you add the next? As a rule of thumb, wait until the first box is about half full before adding the second super. Again, if you wait too long, the bees will start to store down in the brood nest area, restricting the queen's laying.

And where do you put this super? "On top of the other, of course. Isn't that the way all beekeepers do it?" Not necessarily. Back in 'the old days' when beekeepers worked hard and chiropractors had not yet been invented they always did it differently.

Especially our comb honey production, the empty

super was most often placed below the partly filled one. I've tried this over several seasons, but not in any controlled manner. The extra work is considerable. I can't help but think, however, that these early beekeepers often knew what they were doing in areas of bee behaviour.

When it comes time to add the third super, both the previous supers must be lifted off the hives. It's easy to see why few beekeepers super in this manner now.

Rather than continue to add supers if the flow is good, most beekeepers begin to extract the honey already stored. This has several advantages. It means that you do not have to keep as many extra supers stored for that occasional 'boomer' season. It also means that the hive does not get stacked up so high to become a target for stock, wind or vandals to push over. Some beekeepers feel that adding back a super that has just been extracted gives the bees added incentive to keep working as well.

Often when the flow is strong, bees will ripen the nectar but not bother to seal the cells until the flow is finishing. In this case, you can find frames of honey that will not shake from the comb, and yet it is for all practical purposes thoroughly ripened and finished by the bees. This is one of the only cases when it might be considered all right to extract unsealed honey. You could then extract enough frames to give the bees the storage area they need to carry on until the end of the flow.

Another variation that you might consider at this point relates to the size of boxes. Imagine yourself in the situation that you are expecting a late season honey flow, after you have taken off the main crop. From experience, you know that you will probably not get a full depth box of honey from the source. What an ideal time to use smaller boxes! A three-quarter depth box placed on the hive might be just the right amount of storage space needed. Yet another argument (as well as that of the bad back . . .) for using this size equipment. If your brood boxes are three quarter-depth as well, there's no problem with standardisation.

How many frames do you have in your honey supers? Even though 10 frames (and sometimes 11 if you use narrow 33mm end bars) can be fitted in a super, I would not suggest having them there in a honey super. Perhaps to be drawn out, so they are drawn straight and not joined with brace comb, but once you are using drawn combs, reduce the number of frames.

This gives at least two advantages. First of all, you need fewer combs. Most commercial beekeepers use eight frames in the extracting supers. Some use nine. I've known of beekeepers who use only seven, though when I've tried, they get pretty badly joined together and I damage them taking them out of the box to extract.

The second advantage comes when extracting. A comb from a hive with eight to the box is so much easier to upcap because the comb sticks out from the wood just that much further. Trying to uncap combs from frames ten to the box is a test of patience and ability.

So you see, supering up hives is not so straightforward as it would first appear. For almost every operation in beekeeping, you'll find some beekeeper to argue with you over the relative merits of one system versus another. As I said at the beginning of this article, none of these decisions on its own will mean success or failure. Paying close attention to advice (and evaluating the advisor!) and paying close attention to bee behaviour, are two of the best suggestions I can make to any beginning beekeeper.

Hard working, high productivity, gentle to man . . .

Some women are a special breed. They have a certain something, a *je ne sais quoi* that gives them **identity**. Hollywood women have it. You can recognise Hollywood women because they wear gold dresses and striped leotards and get their photographs in the Australian Women's Weekly. Beekeeping women have it too. They may not dress as elegantly, but they do have attributes that make ordinary females pale by comparison.

For one thing, they are not afraid of bees. Bees are their friends, their co-workers, their bank balances. Bees may be a darned nuisance but they are not enemies. Although not all beekeeping women attain to a casual no-gloves relationship with the little winged wonders, they do at least have a live and let live attitude — you keep off my washing and I'll lay off the swatter. Beekeeping women don't flap their arms about when buzzed by a determined stinger (They have usually learnt by painful experience that a speedy exit is much more effective.)

Who else uses melted down foundation trimmings to seal their tomato sauce tops? Or keeps their Christmas trees for weeks after the festive event? (Marvellous smoker fuel). And almost hatching queen cells in the hot water cupboard is just Ho Hum to your average beekeeping woman.

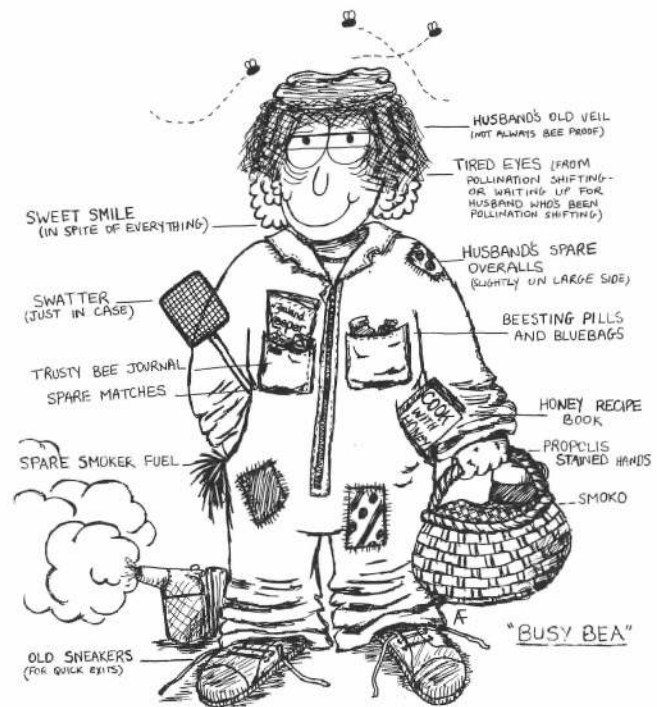
Have you ever noticed what beekeeping men call their beekeeping women? "Hi Honey," "Not sure when I'll be in for tea Honey," "Got five mins Honey . . .?" This last leading question soon enables a beekeeping woman to chalk up an impressive list of **experience**. Wiring and waxing, extracting and straining, become second nature to her. Business books, queen candy mixing, veil repairs, pollination shifting — you name it she has done it (or will do it just as soon as the kids are in bed and the dishes are done).

You don't have to like honey on your weetbix to be a beekeeping woman, but it helps — and so does she. A beekeepers best friend? You bet!

Cooking bee — honey muesli

This home-made honey-muesli is delicious. Lighter than the toasted varieties, tastier than the uncooked type, and very easy to make.

Melt 200g of butter in an electric (or other large) frypan. Add 10 cups (800g) of rolled oats and stir well to combine. Cook for 5-7 mins over med. heat, stirring frequently. Then add 250g liquid honey, 1 cup bran, and 1 cup wheatgerm. Cook for a further 5 mins stirring frequently (the oats brown quickly once the honey is added).



Tip the mixture into a large bowl and leave to cool. Add 4 cups raw rolled oats, 1 cup coconut flakes, ¼ cup pumpkin seeds, and a 200g packet of mixed, chopped dried fruit.

When thoroughly cool, store in a large jar or similar.

To serve, add top milk or milk and yoghurt. No extra sweetening is needed. It's also lovely as a quick dessert, sprinkled on fruit or yoghurt.

The coconut flakes can be bought from health food stores and are shaped like short, flat 'chips'. Using a packet of mixed chopped dried fruit is more economic than mixing your own and there is a nice variety of fruit.

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Out Of The Past

How Airborne Honey Began

Airborne Honey Ltd commenced commercial operations in 1910 at Duvauchelles' Bay, Banks Peninsula, when William Bayley Bray, and his brother Arthur, decided that perhaps beekeeping could be a way to providing a living for themselves and their families.

W.B. Bray received his first lessons in beekeeping from a French master in 1903, while he was attending Christ's College. He soon owned a hive bought from Mr Ambrose Johnstone who also took W.B. under his wing for the first few years.

In 1905 he joined the Bank of Australasia as a clerk at £110 a year. His interest in bees led him to form the Canterbury Branch of the Beekeepers' Assn and he became its first secretary. At the time of the Christchurch exhibition, in Hagley Park in 1907, where he was demonstrating beekeeping, he met Mr Isaac Hopkins who is regarded as the Father of Beekeeping in NZ. He learned that a position of Bee Inspector for the South Island had been created and that Mr Hopkins was, among other things, down to interview applicants. W.B. immediately asked to be considered but, at the age of 19, Hopkins said he was too young. "But I am rectifying that every day!" protested W.B. Several months later he was appointed to the position at £115 a year. The travelling and living allowances were generous and he was able to live on them, saving his salary for later.

In 1908 he joined the Department and embarked on a "Find the Hives" campaign. New regulations outlawing box hives had been enacted and his job must have been colossal. He had to locate hives, register them, teach the beekeeper how to transfer into frame hives, then burn the boxhives. His area was the whole of the South Island! At first he put a push-bike in the guard's van of the train and rode around looking for hives, farm to farm. Later a motorbike made it easier. Disease was rife: at many places as high as 100%.

Two years later he decided there must be a better way of life and, with

his brother, set up an apiary on the site of the present Akaroa Golf Club in Duvauchelles. Arthur sold his interest to Alfred Barrett within a year and then began one of the most successful partnerships I have known. It continued for 35 years.


Alf had left school at the age of 11, and had absolutely no training in beekeeping, yet he had probably the best bees W.B. came across during his inspections. They were Italian and very gentle and I think came from Lenz's in Masterton. By observation he worked out the life cycle of bees and how to produce queens. Alf was quiet and retiring and W.B. just the opposite which I think was the secret of their success. Without a formal education Alf acquired a fund of knowledge throughout his lifetime by observing and listening. He would always help those who were willing to learn and imparted much of his knowledge in a quiet, matter-of-fact way.

Later they moved to Barry's Bay where they set up a proper extracting plant and manufactured comb foundation. They made foundation in their very first years, probably about 1911. Their first mill cost £4. The business continued to make foundation through to 1950, when we decided to expand the packing side of the business. Anyway, Arthur and I hated making foundation and Arthur

found it so boring that he used to go to sleep!

Barrett and Bray operated out apiaries of 30-50 hives in most of the surrounding bays. Transport, of course, was a major problem and bees and horses never went well together. Their first hives were taken over Hilltop by bullock wagon. Not surprisingly they were one of the first to buy a truck: a four-wheeled spring cart with an engine (a Ford T), it could carry six full supers of honey! Alf never learned to drive; just how to hang on! Those Fords had a mag dyno lighting system which meant that you had to go fast to get good lights to see where you were going. Too slow you couldn't see, too fast you blew the lights. But they have improved Fords now: we have five of them.

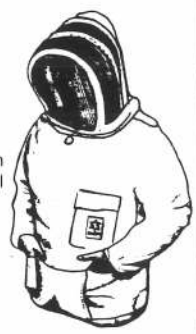
Handling honey was very laborious. Two sixty-pound tins to a case. At the more inaccessible yards they had small sheds and used a 4-frame hand extractor (later powered by one of Cloake's single-banger oil engines). The apiaries were set out on hillsides with zig-zagged terraces down to the top floor of the shed. No pumps, you see, and gravity was the only way. The honey was tinned and cased and taken to Barry's Bay where



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Out Of The Past, cont.

it was strained and blended. In one of their earliest years they produced four tons from 40 hives in Peraki. It was loaded on to drays, taken out to the small boat anchored off the beach, unloaded at Duvauchelles, processed at Barry's Bay, then shipped to Lyttelton. From there it was shipped to England. They got three pence per pound for it and thought they were made!

They had marketing problems in those days, too. One thing was to produce the honey, the other to sell it. Co-operatives didn't work then, either, and so in 1927 they registered two brands of honey: "Meadow" and "Airborne". Meadow was a light amber and Airborne a white clover honey. Honey was not readily accepted as a food source then, mainly because of poor quality and packaging. Many people wouldn't eat it because of the sulphur used to kill the bees in earlier extraction methods. Honey had to be promoted as a food, healthwise and palatewise.

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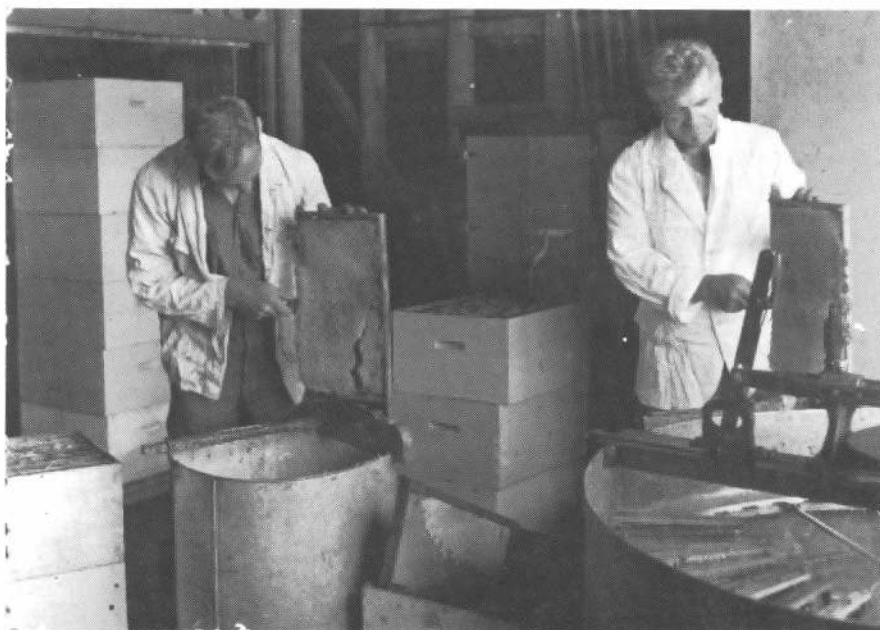
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They took space at shows giving tastes on water crackers. They used displays in shops, school blotters, talks to schools, recipe books. It took a lot of time and money of course but today New Zealanders consume more honey per head than anywhere else in the world and we believe that we have played our part in its successful marketing.

The first honey packing was started in an old church at Little River in 1927. The original packing machine can be seen here today and the tank is still in use in the packing room after 58 years.

About this time they started keeping bees out on the plains having bought some at Irwell. In 1929 the original two-storey shed, 40 ft x 20 ft, was built and has been added to, with almost monotonous regularity, ever since. Today we have plans to build on the vacant area just south of this building. Like most beekeepers we never have enough room.

When we first moved here there were no buildings on our present block. An electric lift was used to haul honey upstairs for extracting and remelting — on the old gravity system. Two major fires nearly wiped us out: the first in 1941 and the second in 1977. Upstairs is now a cardboard storage and workshop area and the lift is a fork lift. Following

the 1977 fire we needed more storage space so we bought the old Town Hall.

After the War, Alf Barrett retired and I took over his interest in the Company which was now W.B. Bray & Son. Later when W.B. retired in 1950, Arthur Gosset, who had been with us off and on for about 16 years, was taken into the partnership. In 1957 it was formed into a limited liability company — Bray & Gosset Ltd. What we hope will be our final name change occurred, when Arthur retired, and we became Airborne Honey Ltd which we see as an on-going name more in keeping with our occupation.

In 1960 we bought out a beekeeper at Hororata: Walter Betts. Walter had worked for us during the 1930's. As we already had a large proportion of our outfit on the outskirts it worked in very well and we established a man up there, firstly Wally Tyrell-Baxter and later Noel Rothwell, who for 19 years was manager and assisted in building Hororata up to an economic unit. Arthur retained Hororata Apiaries when he retired.

When Ron and Roy Newton retired in 1971 we were able to buy their hives in the Ashburton area. Added to our own, it too made an economic unit. We built a house and honey shed there two years ago and Phil

Out Of The Past, cont.

McArthur is now managing it.

The growth of the Company has not been dramatic, rather it has been steadily progressive. We continually strive to improve our production methods and our extracting, packaging, and packing techniques. With the introduction of 44-gallon drums, forklifts and Hiabs, output has increased. This plant was designed to handle at the most 10 tons a week. Now with new ideas, packing machines, etc, we can handle comfortably 25-30 tons a week. This has been largely due to the ingenuity of son Peter and the co-operation of our very able staff. John Bellman, who is new to the honey industry, is contributing very well to the efficient operation of the Company and brings new ideas from other walks of life.

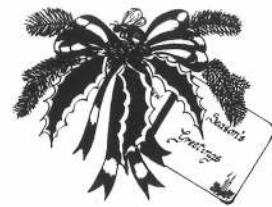
On the marketing side, the competition is as fierce as ever. It is necessary to move with the times. No longer can we sit back and let

honey sell itself. Unfortunately, there are too many who think selling is throwing honey into a pot and taking what they can get for it. We started buying honey in the 1930's, not on a regular basis at first, but when our own crop was down. We were developing quite a nice export business for packed honey when the War intervened and what with IMD, and crops commandeered, and HMA refusal to allow private exports, this went by the board.

In 1977 we established export markets for packed honey and have continued to export both packed and bulk since. Export is now about 20% of our business. Continuity of supply is, of course, the hardest problem to overcome. In order to keep a market, whether it be export or local, continuity in both quantity and quality is the most important ingredient. We feel that we have the support of our regular suppliers, and

their confidence in us gives us the confidence to develop new markets. New suppliers, who have come to us in the last three years, have given us that incentive, too.

You may ask: what will happen in a bumper year? Well, we've had some fairly good years in the past and have coped pretty well with what has been offered to us. Of course, if we had 6% money we could do just that much better. Perhaps we can do some more advertising even if just to prove that W.B. did know what he was talking about.



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BEEKEEPING IN PAPUA NG

Beekeeping in Papua New Guinea could not have wished for a more emphatic vote of confidence than the banning of all honey imports by the Government last May.

Starting from scratch just eight years ago, the industry is not only able to satisfy local demand, which runs at about 70 tonnes, but is also working up the capacity to fill export orders.

Twenty-four tonnes were shipped to West Germany last year, and interest was coming from the United States and Europe in the products (propolis as well as honey) of this smallholder-based industry located in the Highlands region of Papua New Guinea.

It all started in Goroka, capital of Eastern Highlands Province, in 1976 when the New Zealand Government, under its bilateral assistance programme, assigned beekeeper Gavin McKenzie, of Waimate, to work with the Department of Primary Industry for two years on a pilot project.

New Zealand inputs also included short-term expertise, hives, honey processing equipment, and queen bees.

At first the project depended entirely on official backing. But as smallholders were introduced to beekeeping, it became clear that this was an occupation which could fit in with subsistence tasks such as gardening and seasonal work such as coffee picking.

Gavin McKenzie went back on a second two-year (1980-82) assignment to look into commercial beekeeping around coastal Port Moresby, but production and quality problems ruled out the prospect for a lowlands industry.

The company has a policy of running three-month courses every year for prospective beekeepers.

Highlands Honey, for all the burgeoning interest and hard sell, contains one mystery — the bees' source of nectar.

"No-one knows for sure the main flowers involved," says Mr Mopafi. "But I've tasted honey all over the world and ours is tops — a bit like types of New Zealand bush honey."

In the Highlands, though, the industry went from strength to strength, and producers were heartened by the comments coming in about their honey — low in moisture content, well flavoured, and as good as any overseas product.

In 1983 production hit 77 tonnes, and in January 1984 the Department of Primary Industry leased out the Fimito processing factory near Goroka to a co-operative venture, Honey Producers Ltd. Four months later the Government signalled achievement of import substitution by prohibiting all honey imports.

Over 60 smallholders produce for the factory.

An economic number of hives is 150 but the smallholders have anything from one to 250 hives. The average is 100, which requires a total of 30 days' work per year.

The factory pays \$1.38 per kilogramme after deducting 26 cents for repayment of a bank loan raised to capitalise the project.

The company employs a staff of five and is run by nine directors, including chairman Ian Mopafi, who was Gavin McKenzie's counterpart in the early years. He studied apiculture at Gatton College, Queensland, for a year with New Zealand and Australian assistance, and has

made study visits to New Zealand, India, and Mexico.

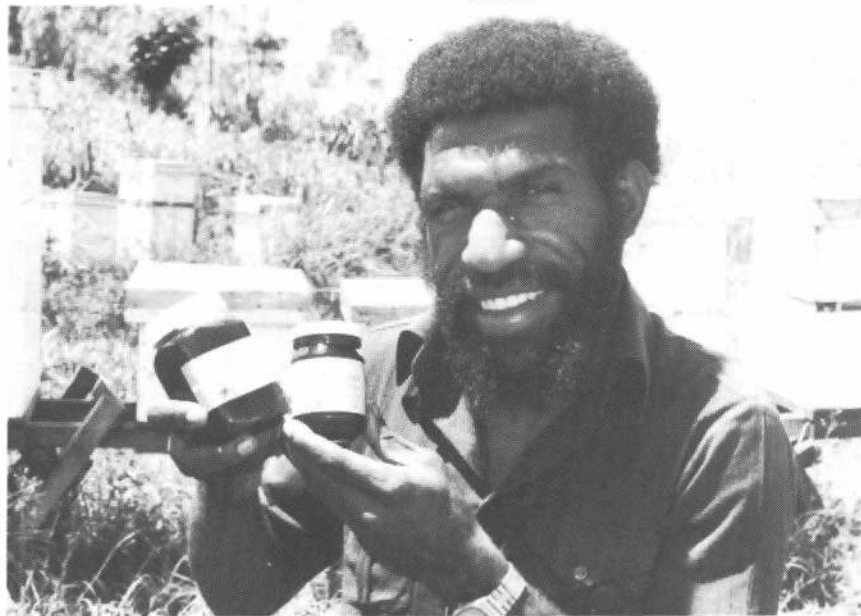
"The task in front of us now is to tap into a potentially huge home market," says Mr Mopafi. "There are over three million people in this country and a very small proportion, mainly expatriates, account for the bulk of the sales at present."

To answer the challenge, Honey Producers Ltd is introducing novelty containers and smaller packaging, and it is putting more resources into promotion, including free recipes which blend honey with local foods such as taro, bananas, and kaukau (sweet potato).

New Zealand assistance to the venture in 1984-85 was limited to a contribution of \$15,000 towards marketing and promotional work. An Austrian volunteer is engaged to assist with management of the factory and the marketing strategy.

Meanwhile, the average number of hives per smallholder is increasing. In some cases smallholders are pooling resources.

Fifty women from a village 35km from Goroka have sent a representative to the factory to serve a three-month attachment. Many of the smallholders now in business were employed on the project in its formative years.



Ian Mopafi, Chairman of Honey Producers Ltd., with samples of his co-operative's products.

Selection Of Honey For Medical Use

Dr Peter C. Molan, Senior Lecturer in Biochemistry, University of Waikato.

Honey is one of the oldest medicines and is still widely used in many of the familiar traditional remedies for coughs and sore throats. The oldest known written record of its use is on a Sumerian clay tablet found in Iraq, dated c. 2,000 BC. This describes several prescriptions incorporating honey. Around 300 of the prescriptions in the Ancient Egyptian papyrus Ebers (dated c. 1,500 BC) included honey. It was used also in Hindu, Greek, and Roman medicine, and reference to its use is in the Koran and the Talmud. In modern medicine it has been replaced by antibiotics for the treatment of bacterial infections: generally only those individuals who prefer to use traditional or natural remedies have kept up the use of honey.

More recently, though, there have been several reports of medical practitioners turning back to honey for the treatment of some infections. It is likely that an increase in this will be seen as still more bacteria develop resistance to antibiotics as a result of the over-use and misuse of these pharmaceuticals. A report in the American Bee Journal in 1979 (vol. 119, p. 792) cites the use of honey under dry dressings in an accident and emergency department of a hospital. It was claimed that it promoted healing of ulcers and burns better than any other locally applied substance. Another usage cited was in 12 cases of wound breakdown after surgery. Bacteriological sterility was achieved in three to six days, and complete healing in eight weeks without skin grafting being needed.

Another report in the American Bee Journal in 1982 (vol. 122, p. 247) said the medical practitioners at several Israeli hospitals are now using honey on open surgical wounds. It is claimed to prevent infection and speed healing, and is thought to work more quickly than many antibiotics because it is more easily absorbed. Bacteria cultured from surgical wounds that required treatment with honey were found to be killed by honey when tested in the laboratory.

There has been a considerable amount of scientific research done on the antibacterial properties of honey. Although there is much variability from one honey to another, honey is generally acknowledged to be quite potently antibacterial. Most honeys will prevent the growth of bacteria even when diluted to one quarter of their original concentration, and many still work when diluted twenty-fold. The growth of some bacteria is inhibited by the high sugar content of the honey and by the acidity (usually pH 3.2 — 4.5). The acidity is due mainly to gluconic acid produced by the enzymic oxidation of glucose. This action of the enzyme, glucose oxidase, produces a by-product, hydrogen peroxide. It is generally held that it is this hydrogen peroxide that is the main antibacterial agent present. Hydrogen peroxide is broken down by light, and it is known that honey can lose its antibacterial properties on exposure to light. The glucose oxidase is inactivated by heating, and it is known that honey can lose antibacterial activity as a result of

heat treatment. The activity is not always lost, however some honeys remain strongly antibacterial after prolonged exposure to light and after extensive heating. This raises the possibility of there being other antibacterial substances present, depending on the floral source of the honey.

Some of the earliest medical writers were aware of the need to select the source of honey used in the treatment of infections. Aristotle (c. 350 BC) specified particular types of honey for the treatment of eye problems. "The Greek Herbal of Dioscorides" (1st century AD) prescribes honey for the treatment of sores, ulcers, and throat, tonsil and eye infections: the best type of honey for these was said to be from Attica, the next best from Sicily. Sardinian honey was prescribed for acne. The same selectivity is not applied by modern-day users of honey despite the marked variability in antibacterial activity reported from laboratory investigations.

Some interesting data on the antibacterial properties of New Zealand honeys has come from research being carried out at the University of Waikato. The aim of the investigation was the identification of the substances responsible for the antibacterial activity. In order to

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Selection Of Honey, cont.

choose the best source of these substances a selection of honeys were assessed for activity. Such large differences were found that it was decided that it would be worthwhile making a wide-scale comparison of New Zealand honeys. The honeys were all diluted to quarter strength with water, and put in wells cut in agar plates containing a bacterial culture. The antibacterial activity was measured as the area of plate clear of bacteria around each well after the bacteria had grown on the plates in an incubator. The honeys used were all unheated, some comb honeys, but most extracted or scraped off the comb. They were mostly from the upper half of the North Island and were up to two years old. They were as true to floral type as could be determined by taste, smell, colour and known time and place of production. The bacterial culture used was *Staphylococcus aureus*. The results obtained are shown in the accompanying table.

The antibacterial activity was also tested with addition of the enzyme catalase which removes hydrogen peroxide. This allowed the activity of the other substances present to be measured. (*Staphylococcus aureus* is not affected by the high sugar content or the acidity of the honey). It was found that in all cases except the kamahi honey the presence of these additional flower-derived substances correlated with high antibacterial activity found before.

Manuka honey was investigated further. The antibacterial activity was found to be very stable on heating, no loss occurring after being held at 95°C for one hour and no measurable loss occurring during one year's storage at room temperature. It was found to be effective at twenty-fold dilution against cultures of a variety of bacteria involved in infections. Only three out of 12 species of bacteria tested were not affected. The effectiveness of manuka and other honeys on a broader spectrum of bacterial species is currently being investigated at the University of Waikato.

Further investigation is also to be made into the properties of penny royal and nodding thistle honey. A larger number of samples would have to be assayed before concluding that these would be as useful as

manuka honey as antibacterial substances. The possibility of mistaken identification is raised by the finding in the five samples of nodding thistle honey tested activity levels from zero to the highest recorded.

A survey, by gas chromatography, of the composition of a large number of honeys currently being carried out in the Chemistry Department of the University of Waikato will assist in identifying the source of the honeys tested. It will also enable the nectar components responsible for the activity to be identified. So far the active components of manuka honey have been found. These are a group of aromatic acids related to the commonly-used food preservative, sodium benzoate. Presumably they occur in particularly high concentrations in manuka nectar.

On the basis of results obtained so far it is recommended that anyone wanting to use honey as an antibacterial substance should use manuka or kanuka honey, preferably as fresh as possible, unheated, and stored out of the light.

Footnote: the honeys assayed for antibacterial activity were donated by many apiarists and were collected by Murray Reid, MAF Apicultural Advisory Officer, Hamilton. The investigation was started by Kerry Simpson and continued by Kate Russell whose work has been published in an M.Sc. thesis, "The Antibacterial Properties of Honey", K.M. Russell, University of Waikato, 1984.

The relative antibacterial activity of a variety of honeys tested on plates of *Staphylococcus aureus*

Honey source	No. of samples	Average area cleared (mm ²)	range in samples (mm ²)
kanuka	2	283	177-388
manuka	13	221	82-480
penny royal	3	221	82-480
nodding thistle	5	146	0-480
kamahi	3	141	28-330
buttercup	5	104	45-330
rewarewa	4	63	28-204
clover	7	38	13-126
mixed pasture	10	22	0-82
heather/ling	5	16	0-63
tawari	2	0	0
rata	2	14	0-28
towai	1	63	
thyme	1	45	
blue borage	1	5	

Library Notes (November 1985)

WORLD PERSPECTIVES IN APICULTURE by Dr Eva Crane, 1985, 184 pp. An IBRA publication of Editorials from *Bee World* covering Dr Crane's 34 years as its Editor. A wide range of subjects, all making interesting reading and all very informative. A book that will give those whose interests go a bit beyond New Zealand's shores a great deal of pleasure and much of practical value.

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*I wish my mind just didn't care
Then I could accept the trend
That all these modern thinkers share
The means that justify the end.*

*That nuclear weapons are OK
Because they give us peace
But there are people here who pray
The status quo may never cease.*

*Oh governments enjoy your power
Control the world by fear
But hope like hell it won't turn sour
And end all life, in a year.*

*Show us by consistency
You think on every word
'Cause even one discrepancy
Can prove your words absurd.*

*Hear me all, and please reform
You know just what the choice is
You never will foresee the storm
If you don't listen to the voices.*

*So I say to you who rule us
Don't make us live in fear
World revolt is now a foetus
And its birth is very near.*

*When spacemen land on this our
earth*

*They'll see that we are missing
A notice for what is worth
They've all gone nuclearfishin.*

*A world without its fauna
Is a world that's lost its sin
When we've destroyed each corner
God can create agin.*

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