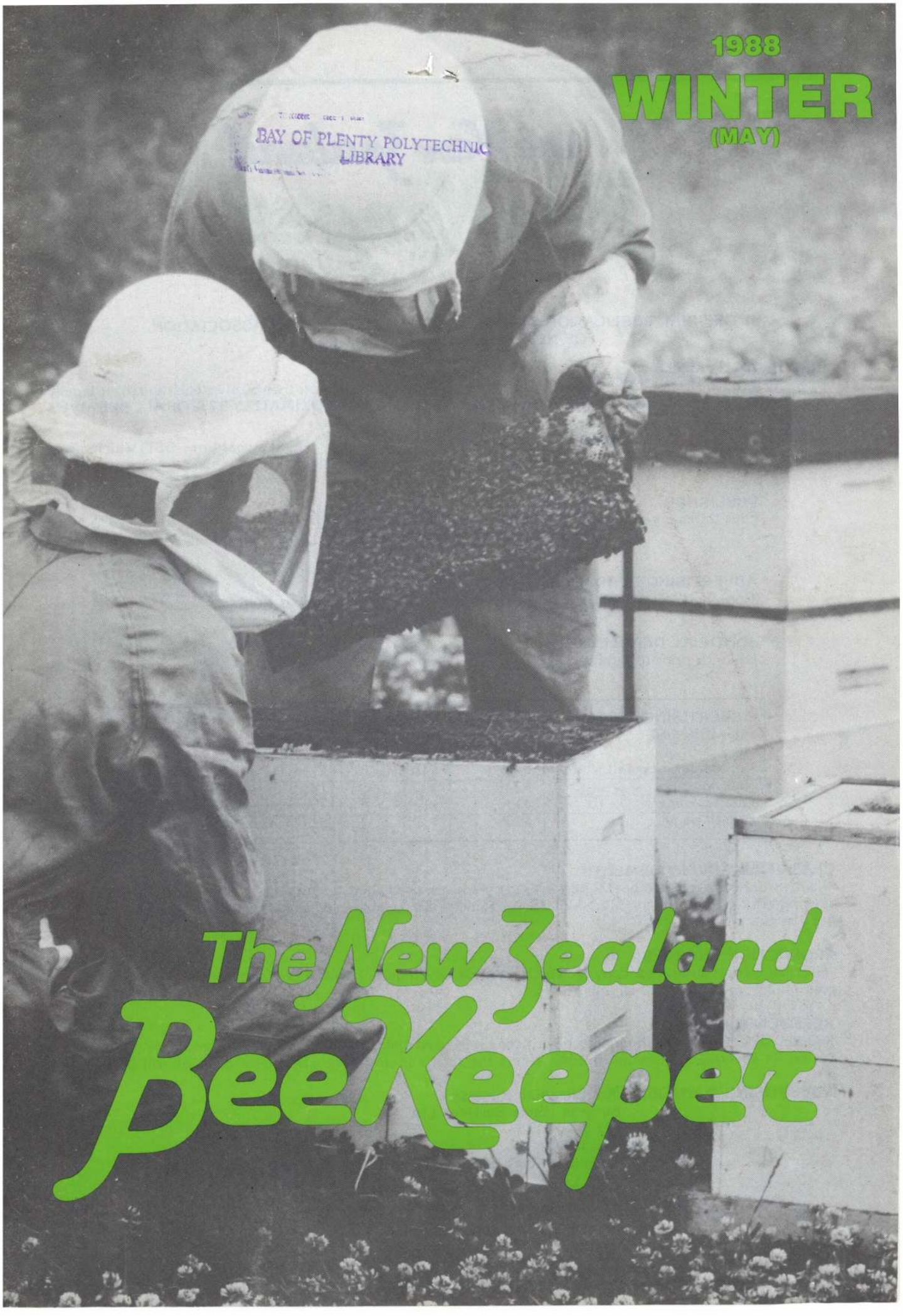

1988

WINTER

(MAY)

The New Zealand BeeKeeper

The New Zealand BeeKeeper

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

CIRCULATION, 1,550 . . .
To Members of The National Beekeepers' Association of NZ Inc. who own more than 50 hives each and so are legally subject to the annual hive levy. **THESE HIVE-LEVY PAYERS OWN APPROXIMATELY 87% OF ALL BEEHIVES IN NEW ZEALAND.**

To Beekeepers with less than 50 hives who subscribe to the journal at $22.00 a year (incl. GST) which also includes membership of the National Beekeepers' Association of NZ Inc.

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FRONT COVER — Inspecting hives. Photo by Trevor Palmer Jones.

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WHY NOT?

On a recent business trip to Singapore, concerning the food industry, a director of Burgess Media Services Ltd was amazed to discover how poorly New Zealand products were represented in supermarkets. Some managers of food departments in these supermarkets expressed surprise to hear that New Zealand could offer products not only equal to, but often cheaper than those imported from elsewhere.

Interesting news; even more interesting when we learn that one supermarket chain in Singapore appears to be substantially owned by companies well known in New Zealand.

Nothing is ever as simple as it seems. The channels of importing-exporting are tortuous, devious, and beset with the rocks and snags of politics. Hence the wranglings over our butter exports to Europe. Frequently a skilled and intelligent political input is needed to achieve the best results.

This raises a question: is the New Zealand Government, be it Labour or National, really geared for this productival cut and thrust?

It is said that we have a Westminster-style parliament. However, there are some marked differences between our system and that of the British. The British Prime Minister, for, instance, may co-opt someone from outside Commons or Lords into a ministerial post, should she think that person most qualified for the job. A recent example is that of Sir David Young, created Minister without portfolio with special responsibilities for employment.

Soon after, Sir David was elevated to the peerage, so entering the House of Lords, thus tidying up the situation for the purists. However, the fact remains that the British Prime Minister has that power, the New Zealand Prime Minister does not. All cabinet ministers in New Zealand must come from the ranks of those elected to the House of Representatives.

When it comes to certain portfolios, fine. Lawyers seem attracted to politics so there is seldom a problem in adequately filling the positions of Attorney-General and Minister of Justice. Other ministerial positions are not so easily filled. How often is the Minister of Health a medical practitioner or a hospital administrator, or the Minister of Trade and Industries a businessman?

Possibly the pecularities of politics fail to attract many so qualified. We are usually stuck with a choice from the various "good joes" whom, in our wisdom or lack there of, we have elected, perhaps solely because they worked hard to provide a telephone booth at the local tennis courts or managed to get a narrow raod widened.

Such people may excel at parochial matters, but those achievements seldom qualify them for cabinet posts where they are exposed to the sharpest and keenist minds of the large nations.

This brings us back to Singapore. Our director saw one brand only of New Zealand honey. There might be others, but certainly she saw none and none were mentioned.

The thought arises: are we being sold short by our political system? Sure, it worked well enough when we were Britain's dairy farm, were little more than a crown colony with Mum keeping an eye on us in case the bottom fell out. But that is no longer the case. We are now on our own and like the mouse that fell into the pail of cream we either drown in the sticky, gooey stuff, or struggle and churn ourselves a raft.

Certainly it would appear that we need to do some churning to increase the presence of our products in South-East Asia and maybe in other parts of the world. Perhaps we should change our Constitution, take a leave out of the British book, and appoint a zapped-up businessman as our Minister of Trade and Industries.

Michael Burgess

Dear Sir,

I am a great admirer of your magazine and complement you on doing a fine job.

I would like to acquire back issues if it is possible. If any are available please let me know by mail which ones and what they cost.

Gary Oberton
RRI
Randall, Minn. U.S.A.
56475

Obituary

Francis D. White (Frank) passed away in Whangarei on 25 December 1987 aged 73 years. Frank was one of New Zealand's outstanding queen breeders and well known for his quiet strain of Italian bees. He served the industry for nearly 40 years with quality queens.

Frank began keeping bees while still at school. When riding his horse to school he would catch swarms in a damp sack in the morning, hang them in a tree, and collect them on the way home in the afternoon. For many years he produced honey but in 1948 developed his queen producing business, helped by his wife Thelma. He was forced to give up his bees completely five years ago due to ill health.

The beekeeping industry owes Frank a lot for the service he gave under very difficult conditions.

Taranaki Sawmills

Taranaki Sawmills Limited started in 1982. It is a modern timber processing plant located on Hudson Drive at Bell Block. Involved is the kiln-drying of Timber, Timber treating, Timber machining, sawmilling and finger jointing of short lengths of timber. 43 new jobs have been created in the province by Taranaki Sawmills since 1982. Modern bedsaws used mean that timber waste is minimal and the sawdust waste that is produced is used to produce heat for the kiln-drying of timber.

Taranaki Sawmills Limited parent company, Jones and Sandford Limited is one of the main merchant outlets for the timber produced. There is also an export market for some lines of timber.

Tongariro Timber at National Park, also part of the Jones and Sandford group, also supplies timber for processing to Taranaki Sawmills Limited at Bell Block.

Botulism and Honey

By Andrew Matheson
MAF Apicultural Consultant, Tauranga

Botulism has again been linked to honey as a health risk for infants. This latest scare has affected some New Zealand exporters, especially those shipping honey to Japan.

The link between botulism and honey was made in the late 1970s, although until now we haven't heard much about it in New Zealand.

Botulism is a type of food poisoning that is very rare but also very serious; depending on the exact strain of the disease up to 50% of affected people may die. The poisoning results from a toxin produced by the bacterium **Clostridium botulinum.** This toxin is said to be one of the most poisonous substances known; one gram of it could kill over 14,000,000,000 average-sized humans.

The bacterium **Clostridium botulinum** is very common and occurs nearly everywhere, including on the raw vegetables we eat. The spores have been regarded as harmless to humans, as they can't germinate inside our intestinal tracts. We only contract botulism when we eat foods in which the bacteria have survived cooking, then produced toxin before being eaten. Botulism is usually associated with faulty preserving or canning, especially of vegetables, meat or fish. (The word comes from the Latin **botulus** for sausage.)

In 1976 all these ideas changed. It was found that the botulism toxin could be produced after spores were ingested, but only in infants less than six months old. Their gut flora is less developed and the digestive tract is less acid than in adults. It is fortunate, though, that toxin production in infants after spore ingestion takes place only slowly, so the condition can be treated fairly successfully. Mortality rate is low.

When this story hit the airways in the US in the late 1970s a lot of detective work was put into finding a link between the affected infants. Quite a few had been fed honey, and some honey samples were found to contain **Clostridium botulinum** spores.

This caused a great stir in the US honey industry, with suggestions being made that honey containers should have health warnings about infant feeding.

Since then further studies have shown that:

- Very little honey contains spores of **Clostridium botulinum** (about 10% of retail packs);
- The spores can be found in plenty of other food (including the honey substitute corn syrup). Spores are also common in other substances eaten by babies, such as soil and household dust.

The types of botulism found in honey do occur in this country, but no botulism has yet been found in New Zealand honey. If you are asked for documentation about **Clostridium botulinum** for any of your exports your should contact MAF's Lynfield office for sampling and certification.

OH DEAR!

By George Nichols

The editor has just trodden on one of my pet corns with his "wicked scientist in his laboratory mucking nature around." Scientists are people who know we are all just at the very beginning of knowledge, that every material thing in our world is chemical, that man himself is worth about $5 chemically.

I have seldom in my life heard such an ignorant statement as "he forgets that aeons of trial and error have eliminated natural imperfections." I knew that NATURE was one of the greatest thought stoppers of all times, but to think that disease, starvation, deserts, infertility, floods, bush fires, excess heat and cold, liver flukes had been eliminated! Usually it is the dear old cluck who says "It is his nature, dear" when her wretched dog has bitten you.

Then we have "If the cow did not defaecate on the grass —." Very nice to have cow dung to help! If all of a cow's dung and urine are spread you get back about 17% of the chemicals she has used. The chemicals she puts back are mostly nitrogen, phosphorus, potassium, calcium, sulphur. These are precisely the same chemicals as you obtain from urea, superphosphate and so on. Of course, on phosphate deficient pastures she puts back even less phosphorus since she does not grow it internally so if we want to produce more and better grass we try to balance the chemical mix to make up for deficiencies.

To grow more nutritious food we should probably turn to hydroponics to do the job properly i.e. grow our vegetables in chemicals in water. Do note the word "probably" and remember that a scientist uses probability and never proof.

When you realise that the scientist, hand in hand with the farmer has, for the first time in history, produced enough good food to feed every man, woman and child three square meals a day you can understand my anger.

Nowhere in the editorial referred to were scientists, "wicked" or otherwise, mentioned. The point was that Man has allowed a great deal of this planet to be misused and polluted frequently because of short-sighted or — dare I borrow the word — "ignorant" policies.

Michael Burgess
Editor.

HONEY EGGNOG

4 to 6 egg yolks
4 tablespoons honey
4 cups milk
nutmeg

• Beat the yolks of eggs until lemon colored. Add honey and mix well. Add milk slowly. Fill glasses. Add a slight grating of nutmeg. Serve at once.
To make an Orange Eggnog, replace milk with orange juice. Omit nutmeg.

Disease Control and MAF Funding — Some of the Issues

By Allen McCaw, President NBA

For the past three or four years the issue of providing funding for MAF apicultural services has been hanging over the beekeeping industry in New Zealand. Ever since the concept of "user-pays" was applied in earnest by the Labour Government, and we saw a major restructuring of MAF into separate divisions, each requiring to earn at least part of their operating revenue, it was obvious that things would never be the same again.

Equally obvious was that if the beekeeping industry wanted to retain its world-acclaimed disease control system, developed over a number of years under the Apiaries Act, then the time would come when it must be financially supported, or it would be lost. There is little doubt that moment is upon us now, and the fundamental issue we face is — TO FUND, OR NOT TO FUND.

From the responses of beekeepers, and NBA Conference decisions since 1984, it can be perceived that the majority of beekeepers in New Zealand value the registration and disease inspection service provided by MAF. It is also obvious that continuation of the present system of destroying hives infected by Bacillus Larvae is preferred to using drug control options. Not so clear-cut is the question of how much should we have to pay for such a system, and who should meet the cost.

Having, as we do, a beekeeping environment free of European Brood Disease, bee mites and Africanised beestocks, there seems to be an acceptance that this is a situation worth perserving. To introduce drug control methods may in fact jeapordise some of our trading opportunities through the potential problem of chemical residues in honey, such as sulphanomides, and chlordimeform, currently causing concern in other countries. Realistically, to resort to drug feeding for the control of the one major disease we have, that being AFB, is a little like using a sledge-hammer to crack an egg — somewhat overdone!

Generally, there is agreement that some form of control system is vital to our industry, since it also forms the basis of our product certifications, Emergency Response Procedures in the event of an exotic disease outbreak, and provides the data base for the NBA. It was on this basis that the NBA Executive considered the options available for establishing and funding a registration and inspection service for the industry, utilising the resources provided within Apiary Section of MAFQual.

This matter was discussed at length at the Industry Planning meeting held at Flock House in March this year, and of the many options available to us, four were finally considered as viable possibilities. There were as follows:

OPTION 1

Total cost recovery based on collection from hive levy payers only (50 plus hives). **Estimated cost:** $1 per hive.

OPTION 2

Cost recovery based on Government contribution, with balance recovered from hire levy payers. **Estimated cost:** Government contribution: $100,000 Hire levy payers: 50 cents per hive.

OPTION 3

Cost recovery based on equal fee for all beekeepers, possibly on sliding scale of hive holdings. **Estimated cost:** $40 to $50 per beekeeper minimum.

OPTION 4

Don't pay anything, and let the service lapse.

Of these, the second was selected as providing the most workable, cost-effective option. Government are to be requested for a direct contribution in recognition of the wider public interests served by beekeeping, and the inherent administrative difficulties in collecting a fee from all 7,600 beekeepers in New Zealand, the majority of whom are hobbyists with no direct connection with the NBA.

On this basis, a submission is currently being prepared seeking the approval of the Minister of Agriculture for the necessary commitment from Government, and amendments to the Hive Levy Act. Subject to receiving Government approval, an application for an additional levy of 50 cents per hive will be made after this year's NBA Conference in Auckland.

No doubt the debate within the industry will continue as to the structure and equity of this option, and opinions will vary according to each individual's position. As a member of the NBA Executive, I have been personally faced with finding a solution which is both workable and sustainable, bearing in mind the costs of administration, which are considerable; the diverse needs and opinions which exist within the industry; and the economic climate which is most unfavourable at present.

As a beekeeper, I am concerned at any rise in costs especially with continuing increases in such areas as ACC, road-user charges, rates, etc. I also share some sympathy with those who express the view that all beekeepers should be levied, irrespective of their hive numbers. On the surface this appears the most equitable solution, but the likely administrative difficulties and costs appear prohibitive.

In the discussions which will occur over a levy of 50 cents to pay for the services of MAF, there are a number of points which should be considered:

a) MAF will not levy and collect bad debts from hobbyist beekeepers — this is stated policy. Equally, the NBA would have great difficulty in administering such a system.

b) If the industry rejects the levy, or witholds significant amounts by under-declaring hives, then the MAF service will be reduced accordingly.

c) The intention is to establish a contract with MAF for apiary registration and an inspection audit system. This differs from the past arrangements whereby we had to accept the service provided according to the requirements of the Apiaries Act. This should lead to an improved service.

d) The NBA will be required to negotiate a contract according to the needs of the beekeepers. This will include a condition that as far as possible, beekeepers will be used for inspection work, thus returning a portion of the funding back to the industry.

e) If AFB gets out of control, or EFB becomes established, then drug feeding will be an inevitable requirement.

The whole question of drug feeding is also worthy of some consideration as I perceive there are both negative and positive aspects to this option. It is not expected that drug feeding would necessarily follow immediately behind cessation of the present control system. In fact, on overseas experience, it could take two to four years to establish the necessary legislation and systems for widespread use. Some form of control would definitely still be required, since at present such drugs are listed under veterinary supervision licensed under the Animal Remedies Act.

Other points to consider in the drug feeding option are:

a) Export certificates would need to be renegotiated. Honey exports would be subject to more stringent testing for residues, especially into Japan and West Germany. The fact that we do not feed drugs at present is probably the only market edge we have for our mixed floral sources, and this edge is very thin in the present oversupplied world scene.
b) Import controls on foreign honies will no longer be required, or tolerated by Government, as they would represent a trade barrier.
c) Based upon present known prices, (oxytetracycline) drugs would cost **minimum** of 66c per hive per annum, (two feeds of 1 gram per hive), plus the carrier which is usually sugar, estimated to cost about 20c per feed. This is a total of **$1.06 per annum,** assuming no extra time is spent in feeding drugs, other than normal hive work. The proposed levy is only 50 cents per hive.
d) ALL hives would require drug treatment, including nucleii. At present these are not subject to payment of a levy, so their maintenance cost would increase markedly.
e) Once started, drug feeding must be maintained — there is no going back without considerable difficulty.

As mentioned, there are some positive sides to the use of drug control for bee diseases, and these should also be considered:

a) Fewer hives burnt due to AFB — (based upon overseas experience, there are still around 0.5% of colonies which have to be destroyed as they show resistance to drug treatment.)
b) Less time needed to check brood for disease — may be able to operate more hives. Pollination hives will still require as much attention — perhaps more.
c) Some beekeepers, especially hobbyists will cease beekeeping because of ill-thrift in their lives, and being unwilling to feed drugs.
d) Less stressful for beekeepers — drugs do give a measure of security against disease, if treatment is maintained.

As these issues are debated I urge you all to consider the wider implications of any decision which is made with regard to funding. There is no easy option, and it is highly unlikely everyone will be satisfied with the final outcome. We are faced with a serious situation, as exemplified by the decline which has occurred in those areas where services have already been reduced.

It must be our ultimate aim to maintain, and improve our disease control system. As has always been the case, the responsibility rests with each beekeeper for the health of his own hives, and in this regard nothing has changed. What we must now consider is, can we as an industry afford to pay for the control system we have benefitted from until now? But even more importantly, CAN WE AFFORD NOT TO? Whichever way we choose, that decision has got to be made now — there is no more time.

"If honey is used with the fruit
The flavor will your palate suit."

A Guy (and his wife) Like That

"Yeah, I had a beekeeper like that in Warkworth", said Brian Milnes formerly Apiary Instructor in Auckland. We were discussing how easy it is for beekeepers to go from being a hobbyist one minute to commercial the next and we may not even have met them.

"I got this call from a guy called Mahon to go and grade some export honey", continued Brian, "and I had to look him up in the register to find out who he was". I didn't think anything more of our conversation until two years later when I was visiting my parents at Algies Bay, not far from Warkworth.

Stephen and Teresa Mahon.

"You must go and meet the lovely young couple in Warkworth who have bees", my mother said. So I did and thus began a long association and friendship with Stephen and Teresa Mahon.

Stephen is a New Zealander and his wife is Swiss, so if you ever get tired of speaking Kiwi and want to try some Swiss-German or even French then they will be happy to do business that way too. Teresa and Stephen had been teaching in Europe for nine years before they came and settled in Warkworth.

A swarm appeared in their garden one day and Des Sharp from Matakana was summoned to collect it. However, Stephen pestered him so much with questions about bees that Des said: "Get yourself a hive and when I find another swarm you can have it". Well, before you could say 'hive bottom' Stephen had 50 hives and was spending a lot of time "helping" Des and learning the finer arts of becoming a beekeeper and a "go-for."

Somewhere about then one of those seasons arrived that every beekeeper dreams about when every flower produces a bucket of honey. Stephen and Teresa produced one and a half seavans of perfect comb honey off their 60 hives, all destined for export to Switzerland. Could you blame them for wanting to give up teaching to become full-time beekeepers after that? Of course not and shortly thereafter Stephen had 400 hives, a new honey house (well, a double garage actually) and an old truck. Teresa got four children, a new house, and an old station wagon! I'm not sure who got the best bargain, but in any case they continued to produce, pack, and export comb honey to Switzerland. They practised their beliefs in the importance of product quality, professional label design, and meeting the needs of the customer. These attitudes are company policy today and no doubt account for much of the success of Ceracell.

As it was in the beginning.

However, fate decreed that Stephen wasn't to last as a beekeeper. Yes, you guessed it: beekeeper's back. So it was time to diversify, and making foundation wax seemed a logical move. This new endeavour was a saga in itself as the foundation machine was faulty. Stephen had never made any foundation in his life and nor had anyone else in NZ who was prepared to help.

But he got there and also began to

As it is now.

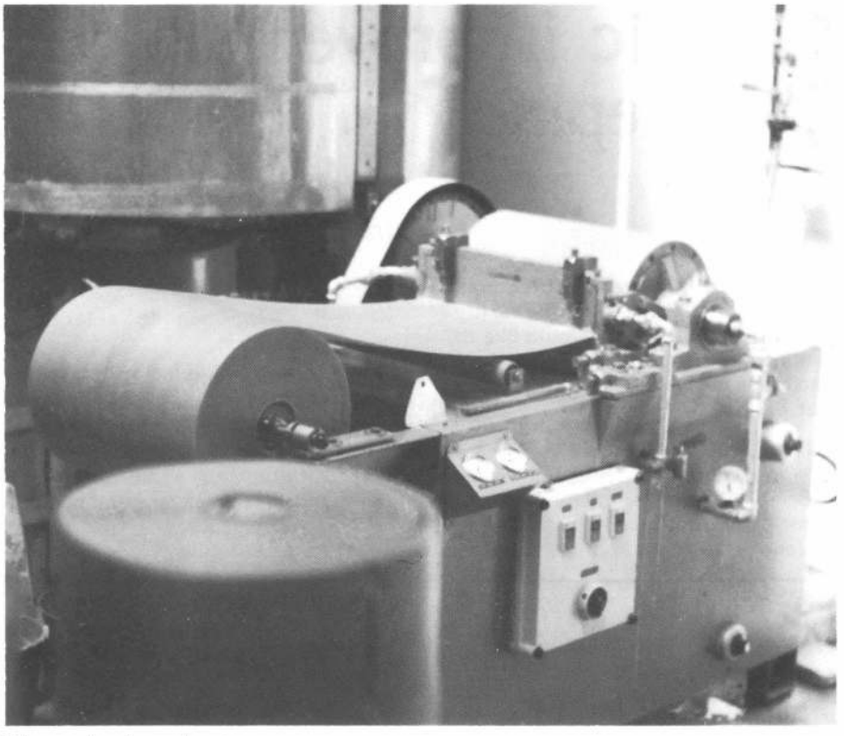
offer a comprehensive range of other bee supplies to go with the wax. This development forced another decision.

"We were so busy setting up the wax foundation and bee-supply business that my hives were being neglected", said Stephen. "So we gradually sold more and more of them, but we kept the honey processing and exporting".

It was decision time again and every indicator said: "go south young man". Auckland it was to be and history is proving that Stephen and Teresa made the right decision.

Their bee-supply business at Tamaki is growing steadily and their motto is: "If we haven't got it, we'll get it for you". Today their business is a happy mix of bee-supplies and packing honey and honey-fruit spreads for both local and export markets. If you haven't dealt with Ceracell yet or one of their agencies why not give them a call?

Are you aware that since 29/2/88 New Zealand Post or the Trading Banks refuse to accept overseas postal money orders without referring them back to the country of origin? To refer them costs $15 each money order.



Wax extrusion plant.

Genetic improvement for New Zealand Beekeeping

B.P. Oldroyd, Apicultural Research Officer
Plant Research Institute, Department of Agriculture and Rural Affairs, Burnley Gardens, Richmond 3121, Australia.

This article is based on the lectures I delivered to NBA meetings during my February consultancy. I would like to thank the dozens of New Zealanders who made me feel so welcome during that period.

The article is divided into three separate sections: Bee Breeding, Races of Bees, Hybrid bees, and the Pros and Cons of Importing Bees into New Zealand.

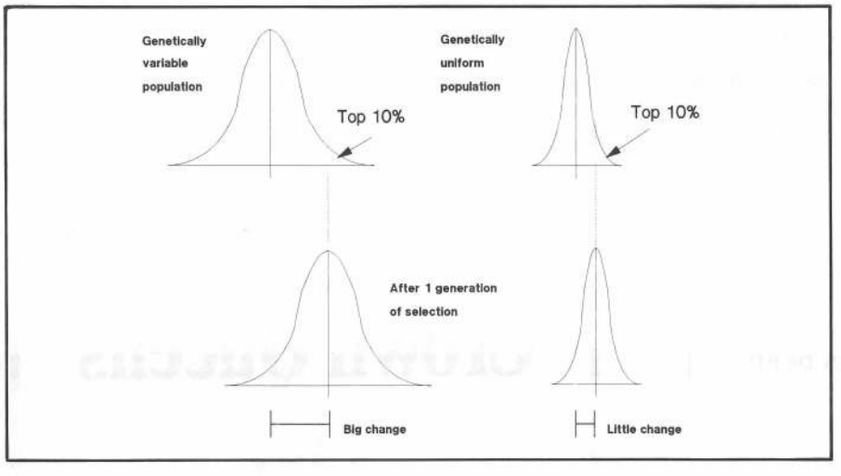


Figure 1. A more genetically variable population has the potential for greater response to selection.

BEE BREEDING

1. What is genetic improvement?

It is the objective of most progressive beekeepers to obtain bees that perform well under their system of management. Genetic improvement is the process of modifying the genes held by an animal or plant, so that it is more suitable for exploitation by humans.

A geneticist might define the process of genetic improvement as: "an increase in the frequency of favourable alleles in a population". The way to achieve genetic improvement is to mate the best animals with the best animals. This process works because the best animals usually carry more favourable genes than poor animals.

We can estimate how quickly genetic improvement will occur in a bee breeding programme by the following formula:

$$R = 2/3\ h^2\ s$$

where R = Response to selection/ generation

2/3 is a fudge factor to take account of the fact that selection cannot be made among drones.

s = standardised selection differential, a number that reflects the selection intensity eg 1/100 or 1/20.

and h^2 = heritability.

Heritability is the most important number in the formula. If the heritability of the character selected is large, then response to selection will be large.

Heritability is made up as follows:

h^2 = Additive genetic variation / Total variation.

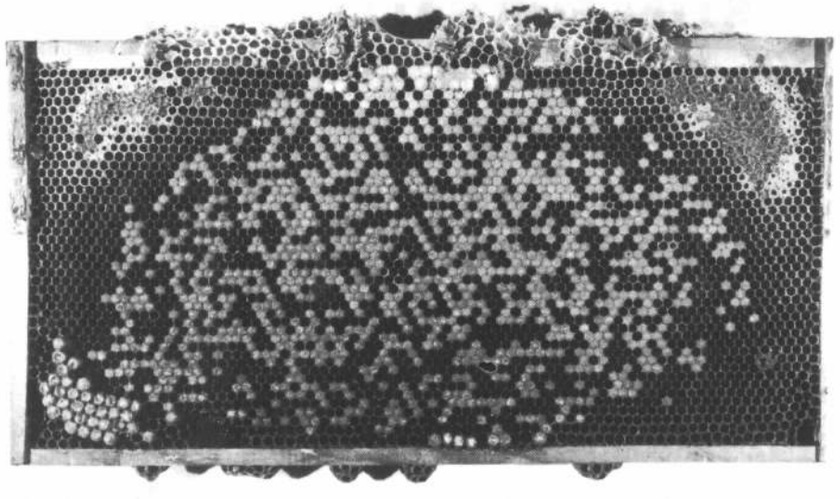
Additive genetic variation is that variation in the population that is due to genes.

Total variation is that variation that is due to genes, plus that variation that is due to environment.

Therefore we can increase heritability (and so our response to selection) in one of two ways. First, we can increase the top line of the equation by increasing genetic variation. This can be done by introducing new "blood" into a population. It is fundamental to bee breeding, that the base population must be highly variable, and obtained from a number of widely differing sources. Figure 1 shows how response to selection can be increased by having a genetically variable population.

The second way to increase heritability, and thus the rate of genetic improvement is to minimise environmental variability. This helps to decrease the bottom line of the heritability formula. Ways to decrease environmental variability include:

Figure 2. Brood of a highly inbred queen mated to related drones.



★ Do all evaluations on the one site.
★ Start with even-sized colonies; even age queens.
★ Prevent drifting of bees.

2. Special problems with breeding bees

The foregoing discussion was applicable to nearly all plants and animals. However bees have several special problems which make bee breeding more difficult than for other species. These are:

i) Choosing breeders

Beekeepers can rarely agree as to what constitutes a good bee. Some select on a good brood pattern, others on colour, others on spring build up, others on wintering ability.

However, none of these things will put money in the beekeepers pocket directly. In my view, we should only select on those characters that are of direct economic importance. These may vary with the beekeeper, but for most it will be colony weight gain, and docility.

ii) Inbreeding

With any selection programme, there will be a tendancy to mate relatives. Inbreeding depression is the inevitable consequence of mating between relatives. Inbreeding leads to a loss of vigour, and will increase the numbers of genetic defects that are expressed.

For bees, the problems of inbreeding are more severe than for other species of livestock. This is because of the sex determining mechanism in bees. Where an inbred queen mates with a single brother drone, half of the larvae which hatch from her eggs laid in worker cells will be diploid drones. These diploid drones produce a special pheromone that will cause worker bees to eat them. This leads to severe patchy brood. See Figure 2, for an example of this kind of brood.

Because of this sex determining mechanism, bees are more prone to inbreeding problems than most other livestock. Any bee breeding programme must therefore take all possible steps to avoid inbreeding.

iii) Control of mating

Bees mate on the wing with an uncontrolled population of drones. Without some control of mating, genetic improvement will be 1/2 that if there is control of mating. If there is no control of mating, the rate of genetic improvement slows to nearly 0 after 5 generations of selection.

Practical ways in which mating can be controlled are:

★ Isolated mating on islands or areas where wild bees can not live.
★ Artificial insemination.
★ Flooding an area with selected drones.

3. A practical bee breeding programme.

A system which takes account of all these problems is a "within family selection scheme". The mechanism by which such a scheme could be run is shown in Figure 3.

To commence such a scheme, the 30 best queens available should be obtained. They should be chosen from as widely varying sources as possible. About 10 virgin queens are raised from each queen. These are then inseminated with the homogenised semen collected from drones from all of the original 30 queens.

All available queens are then evaluated on a good honey flow. The best queen from each family is then used for the next generation, on the basis of weight gain.

Such a scheme accommodates all the special difficulties associated with breeding bees in that: 1) It minimises

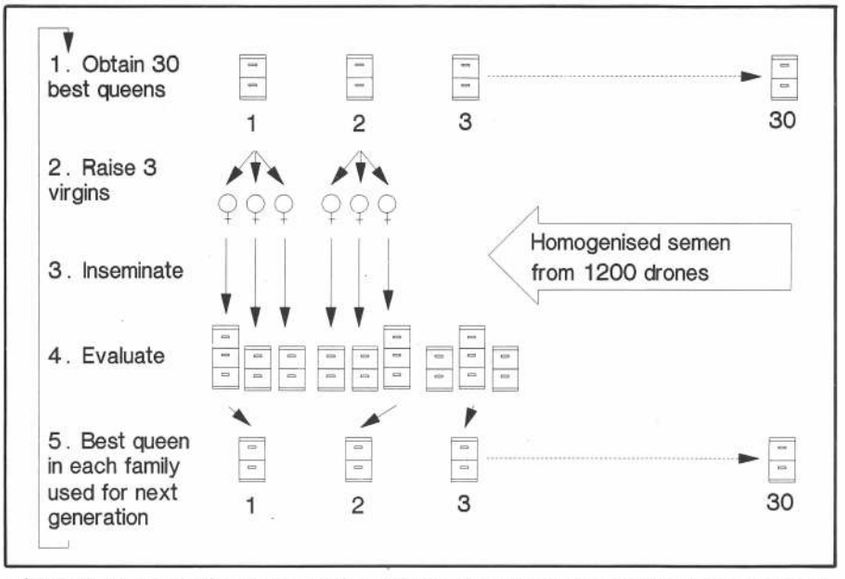


Figure 3. A within-family selection scheme for honey bee genetic improvement.

rates of inbreeding. 2) It controls mating. 3) It has objective selection criteria.

3. The Western Australia Department of Agriculture Bee Breeding Programme.

The West Australian Department of Agriculture has been running a bee breeding programme with Italian-type bees for some years now. The programme is a within-family selection programme similar to that described above. However, it has the added precaution against inbreeding, in that new blood is screened in from industry every year.

This programme employs approximately three government personnel, and is also supported from an industry research fund by about $20,000 a year. Thus it is a very expensive programme to run. However, it is very successful, with the breeding nucleus bees exceeding the production of screened in colonies by substantial amounts, and enjoying enthusiastic industry support.

RACE

1. Defining a race.

A race of bees may be defined as: "western honeybees that evolved in a certain geographical area". About 22 races of bees have been named, and they have been divided into three broad groups: 1) The northern European group (including "black bees", *Apis mellifera mellifera)* 2) The southern European group which includes Carniolan bees and Italian bees and 3) The African group.

Classifying bees on visual appearance alone is difficult or impossible. Therefore a special technique known as discriminant function analysis has been developed.

2. An introduction to discriminant function analysis.

If two meansurements are made on the body parts (e.g. wing length and leg width) in two populations of bees, and then plotted against each other, a diagram such as that in Figure 4 will be produced. If we than took an unidentified bee, and measured the same two characters, we could plot its position on the graph. If the plot of the unknown bee fell firmly in one or other of the ellipses, we would be pretty sure that it was of the same population. But if it fell in the overlapping area, we would call it unidentifiable.

Discriminant function analysis is a statistical method of improving the resolving power of the above graphical method. The analysis takes account of any correlations between the characters, and allows the use of more than two characters. Effectively, it forms a graph of many axes in different dimensions. Several functions are produced, and there are ways of choosing the best function. All this is beyond the human mind, and needs a computer.

One function that has been shown to be effective is:

X = 2.7 (Forewing length) + 2.6 (Hind wing length) + 27.9 (Femur length) - 19.5 (Tibia length) - 46.6

So we measure the wing lengths, and the segments of leg, multiply these measurements with the coefficients above, and produce the magic number "X".

If X is greater than -0.9, it is likely that the sample is European. If it is less than -0.9, then it is likely to be African. The computer will also tell us what the probability of the sample being African or European is.

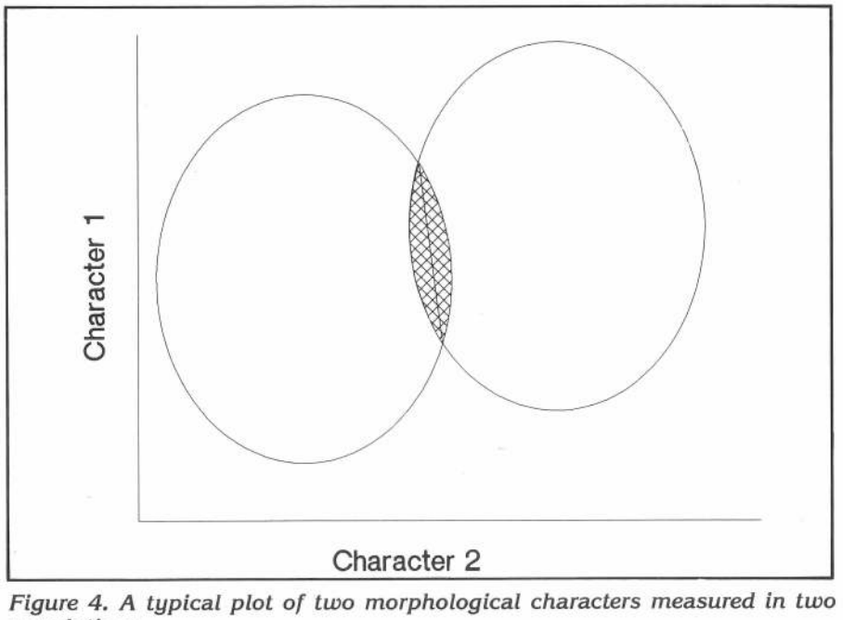


Figure 4. A typical plot of two morphological characters measured in two populations.

Using techniques such as these we can get an idea of the relationships between the races of bees. It has been shown that Italian bees and Carniolan bees are very closely related. Indeed, some have said that Italians are merely blonde Carniolans, or, if you prefer, Carniolans are brunette Italians. On the other hand, morphometric analysis has shown that black bees *(Apis mellifera mellifera)* are very distantly related to Carniolans and Italians.

3. Racial differences in honey production.

In 1983 I conducted a study which compared the honey production of nine lines of bees from three different races. The results were as follows:

Table 1. Deviations from apiary average of nine lines of bees (Kg. weight gain).

Line	Race	Deviation from Average
1	Italian	+ 5.66
3	Carniolan	+ 1.34
5	Caucasian	+ 0.93
9	Mixture	+ 0.79
6	Caucasian	- 0.02
7	Italian	- 0.33
4	Carniolan	- 1.20
8	Italian	- 3.25
2	Italian	-3.93

This table shows that the best line and the worst line were of the same race: Italian. It also shows that the top three lines were of three different races. We can therefore conclude that not only do Carniolan bees and Italian bees differ very little morphologically, but that it is rediculous to state that one race of bees has superior production to another.

RACE HYBRIDS

What happens when we cross two races or lines of bees? This is probably best explained by a figureative example. Let's make the following assumptions:

- ★ Genes take different forms known as "alleles"
- ★ Favourable alleles are denoted by capital letters
- ★ Unfavourable alleles are denoted by lower case letters
- ★ Favourable alleles are dominant over unfavourable alleles

Assume that we have two good lines of bees which are pure breeding. Because they are pure breeding, they will have identical alleles at each gene locus. We then cross these two lines as follows:

Parents:

aBCdEfGhI	X	AbcDeFgHi
aBCdEfGhI		AbcDeFgHi

Offspring (F1)
aBCdEfGhI
AbcDeFgHi

The offspring of this first cross are nearly always better than their parents because they have a favourable allele at each gene locus. Some breeding programmes (especially plant breeding programmes) try to maintain first crosses in order to exploit heterosis or hybrid vigour. But what happens to the next generation (called the F2)?

If we mate two F1 crosses:

aBCdEfGhI X AbcDeFgHi
aBCdEfGhI AbcDeFgHi

We get a random assortment of alleles in the offpsring as follows:

abcdefghi aBcdefghi abCdEfgHi
AbcDeFgHi ABcdEFGHI ABCDEFGHI
abcdefghi abCdefghi AbcDeFghi
abcDEFghI ABCdEFgHI ABCDEFGHI

Very poor-------Average-------Very good

The average performance of the F2 will be the same as the average of the parents. However, there will be some very poor individuals in the F2, and some very good ones. If the very good individuals can be identified, then these can be bred from, and the initial cross will have been worthwhile. However, if the F2 is just allowed to freely mate in a uncontrolled manner, then the benefits of introducing new stock will be completely lost.

PROS AND CONS OF INTRODUCING NEW BEE STOCK INTO NEW ZEALAND

i) Bee breeding is expensive. It would undoubtedly be less expensive to import improved strains of bees rather than produce your own.

ii) If imports are not allowed, then smuggling may be encouraged. In Australia, this was recently witnessed, when blackberry rust was illegally imported after years of delay with official import. Proper testing of host specificity had not been completed, and the most effective strains may not have been introduced.

iii) Some have claimed that New Zealand has insufficient genetic variation in the honeybee stock to allow a viable industry in the long term. In my view, this is not a valid argument as even casual observation reveals that there is a wide variety of stock in New Zealand.

iv) Some potential export markets may require certain genotypes which are not available in New Zealand. For example, some people have a particular desire for "Carniolan" type bees.

2. Arguments against importing queens into New Zealand

i) There is a very very small chance that quarantine could fail to stop a new disease, or fail to detect Africanized genes. This risk can be considered insignificant, but it is not zero.

ii) There may be some marketing advantages in being able to say to the rest of the world "we have made no imports of bees into this country since the 1950's. Our disease-free status is excellent, and we are keeping it that way."

3. Conclusion

It is not my intention to recommend to you whether or not queen imports should be made into New Zealand. What I have done, I hope, is provided sufficient information for your Industry to make an informed decision on the matter.

"A little honey in the canning
Mixed with the juices is good planning."

South-western at the Levin

photo 1
Jackie Ashcroft and friend.

photo 2
Educational display board.

photo 3
Pollination display board.

◀ *Photo 1*

Photo 2 ▼

Photo 3 ▼

Horticultural Field Day 19-20 Feb, 1988

Photo 1

Photo 2

photo 1
More public interest.

photo 2
Merv Farrington, Longburn, by the observation hive.

photo 3
Public interest in the displays.

Photo 3

South Canterbury

Another beekeeping season has passed and generally local beekeepers should feel satisfied with the honey crop. Coastal areas gave above average returns, further back and the foothill country gave below to close to average crops, while the high country would average out quite well especially in areas where Vipers Bugloss is well established.

Honey crops on the plains were patchy: the light land dried out early so returns there were not so good but the heavy land produced very well. Nodding thistle did not appear to grow abundantly this season and did affect the honey production in those places where there is usually prolific thistle growth. Perhaps the introduced weavil to control the thistle is having some effect?

Autumn requeening is now finished and with most beekeepers well under way with wintering down everyone should be able to look back on the season with some degree of satisfaction and look forward to the usual winter spell away from beekeeping.

The black blot in the industry is of course the price honey buyers are offering, as low as 80c per kg. Sellers should ignore these offers as indications are prices will improve later this year.

With the deregulation of the sale of sugar, good deals can now be made with importers, making sugar feeding for overwintering very attractive.

The local Branch of the National Beekeepers' Association appears to be in the doldrums at present. No meetings nor Field days to report on. However perhaps the annual meeting will revive activities.

Unfortunately I must end these notes on a sad note, the death of Vince Cook in England will be mourned by many beekeepers. Vince was a man respected by all who knew him, a man who gave a great deal to the New Zealand Beekeeping industry and our sympathy is extended to his wife, Susan, and their family.

Harry Cloake

Southland

Branch activities for the year have followed the usual pattern of meetings and Annual Field Day.

An extra item this year was a Forum, organised to present a varied view of the honey market and consider options. Hopefully it at least helped raise awareness of the seriousness of the situation beekeepers now face. Invitations were extended to Otago and Southland beekeepers to attend. Question time after the invited speakers showed the keen interest of the good representation of producers present.

Regular Branch meetings attendance is still very poor — perhaps reflecting economic conditions but probably I suspect just due to apathy. If the beekeeping industry is important to you surely you must want to be involved in discussions on practical and political matters affecting its future viability.

Our Annual Field Day this year was held at Fiordland Apiaries, Te Anau. Our thanks go to Ross and Ivy Saunders for making their facilities available to us. It proved to be a most satisfactory venue and the weather was ideal. There was a good attendance of beekeepers and many favourable comments on the programme content.

Branch members were invited to an evening at Telford to hear and meet Dr Ben Oldroyd, a geneticist from Melbourne, in New Zealand on NBA sponsorship to evaluate our bee stocks. It proved to be a most informative evening, presented by a very able lecturer. It is a pity that more beekeepers did not avail themselves of the opportunity to listen to and learn from this very interesting speaker. I am sure that all those present felt the effort of attending was amply rewarded.

Our thanks go to AAO Clive Vardy and NBA Executive Member Keith Herron for their regular reports, keeping the Branch up to date with developments in their respective fields.

Secretary Russell and his wife have again contributed much to the Branch's efficient functioning, both in secretarial services and socially. My special thanks to you both.

Alister Lee

Otago

Except for some early flow before Christmas it was not until late January that the weather changed for the better.

The crop gathered in most places ranges from 10 kg: to more than 40 kg. per colony. That is surplus over winter stores.

Some areas were a wash-out so a good bit of shifting hives and temporary relocation took place. The honey shows, in general, a lot of colour, and less water white than usual. Interest in cut-comb and high-moisture honey is growing as producers look for alternatives to the production of traditional extracted honey. Returns for that product are a matter of great concern at present and some beekeepers are undoubtedly facing serious financial difficulties. Price cutting on the internal market is not helping things one little bit.

The report made by Allen McCaw at our AGM did nothing to help lift the prevailing depression. It would be a pity if so much which has been created in the past for the good of the industry and agriculture in general is lost as a result of what must surely be temporary circumstances.

Paul Marshall, known to many of you, was elected President and Neil Walker Secretary. Neil has done a stint before.

John Heinman

Hawkes Bay

March 8, 1988 will go down in our history books as the day when the East Coast from Hicks Bay to Hastings was devastated by Cyclone Bola and the floodwaters that followed. Obviously our neighbours in the Poverty Bay and East Cape areas suffered much worse than we, but just how many beehives in the Northern Hawkes Bay area were blown over, half buried in silt, or washed down the creeks and streams will never be known. But if nothing else, Cyclone Bola turned what was to have been an extremely poor season into one that was a total write off. Nevertheless the spirit of our Branch is still a "fighting one." Members have salvaged what they can from the wreck and are now busy battening down for the winter.

Two very good Branch meetings were held recently. Our February one was attended by two members of the pest destruction board whom we hoped would tell us the secrets of eliminating the wasp problem, and at the March meeting Mr Berry, a leading accountant from Hastings, gave a very interesting and educational lecture on the financial problems of a "good keen beekeeper."

A happier note was the visit to the Waikato Branch Field Day on March 12 by a car and bus party of our members and supporters. Undoubtedly the highlight of the trip up was the discovery that we had a birthday girl on the bus. Someone produced a cake and candles!! Imagine 15 beekeepers hanging out of a bus on the road-side at Tirau singing happy birthday. I can assure everyone that a piece of that same birthday cake for supper at the motel that night was just delicious.

It was very interesting comparing a field day put on by another branch with ours, and the fantastic barbeque tea afterwards was — well! Imagine beautifully barbequed kiwi venison going begging on the hot plate at 8'o'clock at night. But it happened.

The trip home Sunday was via Kihikihi to visit Mr and Mrs Clements honey house and packing depot, and down the southern Waikato where we saw numerous hives that had suffered in the storm and thousands of acres of pine forests destroyed by the same cyclone.

By the time this is published we shall have had our annual general meeting but we are assured of a good turnout. We shall then know who will be our president, secretary and committee for the coming year.

Gordon Sutton

Marlborough

The season had a slow start with a bitsy December which maybe caused the dominance of manuka/kanuka honey. By the end some were pleased and some not.

The lake Roto-iti weekend at the end of January was a brillant success, in all respects: weather, venue, company, speakers, and discussions. Thanks to all those who attended and made it a success. At the end it was decided that Nelson should organise a similar event in two-three years.

After listening to Dr Denis Anderson's talk on Half-Moon Disorder it is obvious that the management of sticky egg-hives will be more important in future if we are to avoid those hives, good at the end of spring but failing to perform as honey collectors. As a follow up Denis gave me a hand collecting honey for a day while waiting for his plane. Of the two sites of 24 hives each that we visited, each site had four hives that produced less than half the average: ie. duds. There were five sticky-egg queens and three with bad chalk brood.

The visit of Dr Ben Oldroyd inspired some of us to go over the hill to Nelson. For every question answered, several more cropped up.

We recently held our AGM. Guest speaker was the local MAF apiary disease inspector, Dave Grueber, who told us of his highs and lows as the replacement of Andrew Matheson on hive inspection. He had problems with his allocated 10 man days and 1,000 kms. He discovered an area with an 83% disease rate — his superiors gave him extra kilometres but as he has run out of man days, he could not use them. Sounds as if MAF will have to sort themselves out if they are to inspect 10% of all sites on contract to the NBA.

The Blenheim court had its first conviction under the Apiaries' Act. Some of us think the accused got off lightly. How can beekeepers be so thoughtless?

Coming events this winter include a honey promotion day in one of the local shopping malls.

While I'm feeling venomous ... Good on you Hororata for telling me in a circular that you would not price cut but put your money into promotion.

James Jenkins

North Otago

It is with great regret I have to report the death of Vince Cook in England. A former Oamaru AAO, Vince would be well-known throughout the South Island, not only for his beekeeping expertise but as a public speaker to groups such as Rotary, Lions, Roundtable, and the Women's Division.

Vince had a theory that if your could get a farmer's wife interested in the importance of bees around the farm you had the farmer also interested. He also pushed the barrow for beekeepers and made sure that farmers remained farmers and not farmers-come-beekeepers.

Our sympathies go to Susan and family.

Our honey crop expectations of three tonnes a hundred seem to be out the window, due to the weather. Two to two and a half tonnes seems to be the average. Only a few are a bit better off.

Our Branch meeting in April should be interesting. Allen McCaw and Clive Vardy will discuss hive levy proposals and the MAF current position as well as a market report.

G.R. McCallum

Nelson

Summer has been and gone and its most pleasant feature was the absence of wasps. We had some heavy rains which, plus damage from the wasp parasite, seems to have cut them down to size.

The earlier part of the season was perhaps more favourable for the local area, although heavy rain during the middle of January adversely affected the topping off of a lot of supers.

Beekeepers who gathered at St Arnaud were blessed with pleasant weather. At a later date we all enjoyed the visit from the Australian expert on the genetics of the honey bee.

No forecasts for the coming winter and spring.

Ron Stratford

Westland

Winter is just around the corner. In retrospect much of our autumn seems to have been merged with late summer and the summer work programme, which lingered on due to a reasonable showing of rata, interrupted regularly by unsettled and, at times, unseasonable weather.

Reports from other members indicate a reasonably good crop with average or better production and lighter, milder grades of honey produced. With that achieved, our thoughts now turn to markets, prices, and whether or not these exist, and if so, will they yield satisfactory returns?

Although reports indicate that at present prices are a little better than the 70-80 cents per kilo rumoured at the beginning of the year, they are still considerably below last year's prices, which, while we understand many of the reasons why, is certainly far from reassuring. But then we're not in that position alone — that's for sure! Westland's economy in general is sore-pressed.

The tail of cyclone Bola caused some damage to the Karamea area before it dissipated in the Tasman Sea. But, for the rest of us, we were spared that onesider encounter. No doubt there will be considerable comment of damage received to beekeepers elsewhere in this issue. We sure sympathise with those who felt the brunt of the storm.

Well, back to wintering down and that ever-necessary repair and maintenance work.

Sandy Richardson

Northland

Manuka was a bit of a washout but then the weather improved and we had a good flow from blackberry, clover, and the usual pasture plants. Towai flowered all right but the bees did not collect much of it. Perhaps they prefer white rata which was on at the same time.

The cyclone stopped production for a few days while the power lines were repaired. Only five of my hives were blown over.

George Nichols

Bay of Plenty

The kiwifruit pollination season went well with most hives in good order and doing a good job. The conditions for pollination were favourable so those who supplied poorer-quality hives will have got away with it. When conditions are more difficult orchardists will discover the difference between realistically-priced hives and the cheap ones.

The KPA assessors did a splendid job of monitoring hives and managed to assess hives belonging to over 90% of members. The vast majority of hives achieved the standard set by the KPA with only a few borderline or below standard. Thanks are due to the three assessors: Doug Briscoe, Alan Murray, and Jack Higgins for a job well done.

Distance between apiary sites is a continuing problem in this area with some beekeepers persistantly putting hives right next to established apiaries, sometimes only a few hundred metres away on the same farm. It is very annoying (to put it mildly) to place ones own apiaries at suitable distances apart, or away from a neighbouring beekeeper, only to have that neighbour or another beekeeper move into the gaps.

Another factor is the tendency of some beekeepers from other areas to set up permanent apiaries on the sites they've used as dump sites just before pollination (100 metres from a local beekeeper's apiary). The hives are still there.

By all means bring hives here for pollination but do it at a realistic price. Site dump sites carefully and take your hives away promptly afterwards.

The Branch held a Field Day in February at a local park. It was a pleasant day in an attractive location with some interesting speakers and a barbecue. Mark Goodwin was able to throw more light on the effects of sugar feeding during pollination with the result that an effort is being made to perfect sugar feeding methods to speed the job up and reduce the risk of robbing.

The honey crop has not been good this season with some beekeepers producing very little and most receiving a reduced crop. Wasps don't seem to be quite so bad this year, probably because of the wet weather.

This area escaped serious damage from Cyclone Bola but our friends in the Gisborne and East Coast districts were not so fortunate and some suffered serious losses. We extend our greatest sympathy to them and hope they can return to normal as soon as possible.

Peter Townsend

Cost effective timber coater

A timber coating machine, introduced by a British company, allows small to medium sized building companies to treat their own timber. It is claimed that the resulting savings allow the cost of the machine to be recovered in a few months.

The UTC, from Trentham Associates, handles plain or moulded timber of section up to 300 x 100mm, in any length from 750mm. Output is 45m/min.

The motor is explosion proof allowing low flash materials and solvents to be used safely. The starter has overload protection.

The machine can be easily wheeled around a site or from one site to another. Optional material change tanks allow the coating type to be changed in minutes. Most gloss paints, stains and varnishes can be handled.

"All candy calls for flavor sweet
And honey therein can't be beat."

Improving Bee Nutrition

By Reg Clarke

Beekeepers are a conservative lot; but then the craft has been practised for some 3,000 years. Soon the sharp spurs of economic necessity may urge us to be more innovative.

Listening recently to Dr Ben Oldroyd convinced me that under today's business conditions, we cannot afford to ignore the potential for increased production that would result from the application of modern genetic science. Is the Industry ready for some positive action on that at the coming Conference?

In the meantime, let us consider another science negleted too long — bee nutrition. There is only sparse research to draw on, and most of that is published only in obscure East European languages. I can offer only a layman's general grasp of the subject, but until others, better qualified, join the debate this is at least a start.

First, a couple of basic principles.

1. At the cellular level there is remarkable similarity between the chemistry of all living organisms.

2. Each specific organism has its own precise needs and capabilities. The substances known to be essential include some 40 chemical elements and compounds, classified as minerals, trace elements, amino acids, vitamins, etc. Some creatures are able to manufacture their own vitamins, but in that case the diet must include all the ingredients needed.

In every branch of farming that has progressed beyond the peasant level, these precise needs are catered for, by applying minerals and trace elements to the soil, and supplying other more directly via salt licks, drenches, injections, etc. Only the soil applications are available to bees, and then only in farmed areas. We use none of these techniques, and the reason lies in the nature of beekeepers and the traditions of the craft, rather than the bees having some unique exemption from the laws of nature. The bees must obtain all their needs from the pollen nectar and water available within their flight range.

Not all needs will be fully met, and this imposes a nutritional stress. In the long run of evolution, creatures adapt or perish, and cope with an imperfect environment as best they can. If the bees, and ourselves are to thrive, these stresses should be removed, and optimum conditions provided.

We should first give attention to the trace elements. Soil scientists can tell us with precision what is lacking in the soil and where farming practice has not corrected this, we can supply what is missing directly to the bees at little cost. Unfortunately, bee scientists have so far given us few clues to the bees needs, and until they do, we should be guided by general principles. The scant research available does show that bees have extremely high needs for some nutrients in comparison with higher animals. Expressing these on a per kg basis, and assuming about 5kg bees per hive, we find:

Vitamin C — 30 times human need

Cobalt — 80 times sheep or cattle needs, or 1,000 times human need

Selenium — Beneficial effect at levels toxic to humans.

Bear in mind that the nutritional needs of any creature are always greatest in reproduction, and that optimum function of that phase is absolutely crucial to beekeeping in all its aspects.

So much, then, by way of introduction. In future articles I hope to look more closely at some specific nutrients. Some readers may have valuable expertise in this field. If so, please get in touch with me. Better bee nutrition can lead to increased productivity, if only we can draw on and apply in a practical way the scientific knowledge required.

Winter Work

By John Heineman

Your hive or hives should now be snugged down for the winter. If proper attention has been paid by you to their requirements as outlined in the previous issue of the Beekeeper, you can rest easy in the knowledge that they will survive the rigours of the winter.

Don't worry about a bit of cold weather. If colonies can survive harsh climates such as Canada, Norway, or Sweden with deep snow, severe frosts, and days with only a few hours of light, our concern is minimal. No need for sacks, tar paper, bats, double-walled hives or pieces of old blanket, be it North of Kaitaia or down at Bluff. Plenty of stores, dry conditions, no disturbances, and a strong enough colony with a good queen are the right ingredients for good wintering.

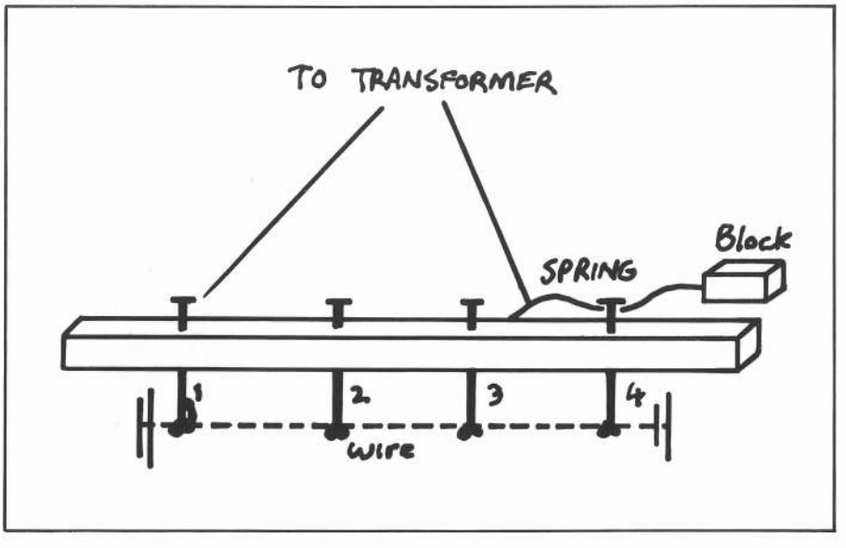
Mind you get all the muck from the groove in the top bar and prick the wire holes in the end bars through. An odd nail here and there is called for to stiffen wobbly frames. Re-wiring comes next. Andrew Matheson's book PRACTICAL BEEKEEPING gives a good plan for a wiring board (page 44).

On page 45 you find a description of an embedder. The one we use is a little different but works well and has done for the past 25 years. It has done tens and tens of thousands of frames. The wiring board too has served us all that time.

We use an old 3 v. radio transformer, picked up for a couple of dollars. This is gentler than a 6 or 12 v. source and still fast enough. There is a little less trouble with cutting right through the sheet of foundation if you are not quick enough. The embedder itself has not cost one cent. Materials needed: a 25 x 25 mm stick 650 mm long, four 100 mm nails, an old spiral bed spring, and some light electrical wire.

Cut stick to length and sandpaper. Drill holes for nails so as to get a tight fit. Insert nails. Space between nail one and four 420 mm. Space between all four nails 140 mm.

Hammer the points of the nails flat on a hard (steel) surface till a spatula shape is achieved. File or grind edge to spatula end. Turn nails ¼ turn so that ends will touch across frame wire. Straighten bed spring, cut to right length, insert into stick between nails three and four and other end into block. Bend spring in such a way that with light finger pressure contact can be made with nail four. Spot solder wires to nail one and to spring. Nail two and three to ensure even pressure on frame wire. Nails must all protrude for exactly the same length.



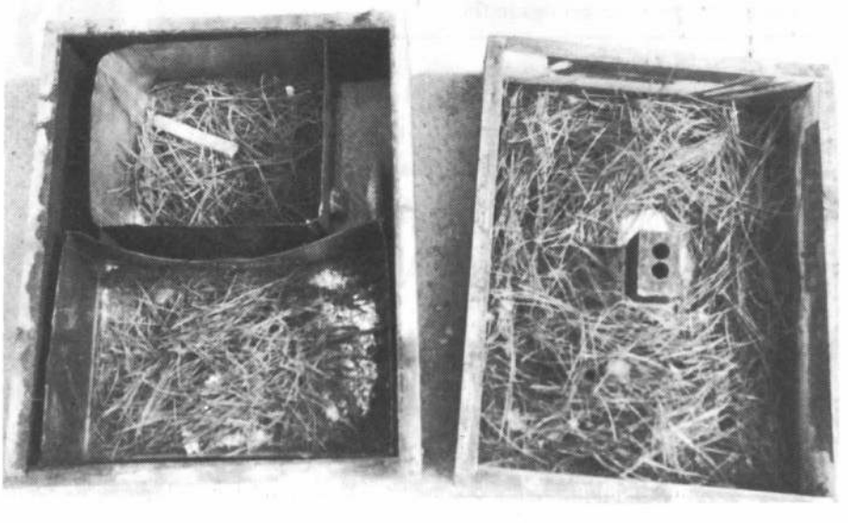
Left is a cut down full-depth super 125mm high. Containers old 4 g. tin cut lengthwise and bottom of another. Capacity 12 ltr.

Right well made with hard board bottom and block with 2 x 20mm. holes as tunnels. Hard board is inserted in groove as with inner covers. Tight fit and glued. Corners also glued as is block. All corners first painted and then the whole feeder parafin waxed for preservation and waterproofing. Besides glueing, nails or staples have been used. Capacity 14 lts.

So, for a while we should leave our colonies in peace without interference. Nature wants it this way and I think that a golden rule in beekeeping management is to always try to work with nature, not against it. Being at cross purposes with nature leads to failure.

All this however does not imply that you should forget your interest for the next three months. There is maintenance to be done and if that is up to scratch you may want to extend your hive numbers. And you can do worse than to set some time aside to learn a little more about what you love and improve your understanding.

As for maintenance, first your combs and frames. Culls have been cut out and there are a number of frames which can be re-used. Clean them first. On a small scale a good boil-up will do the trick.

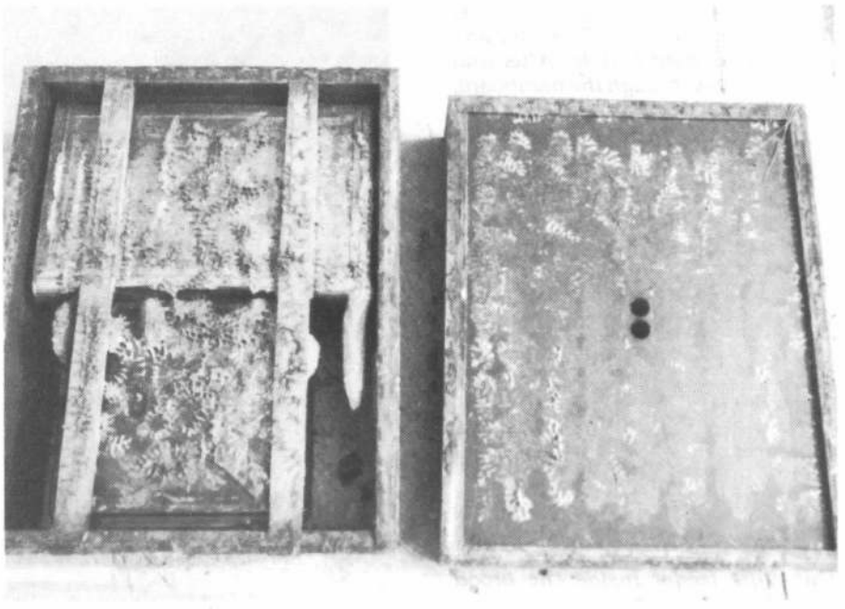


Making yourself a wiring board and embedder is good fun and if well made they will give service for many years to come.

Remember that wire will expand with heat and that wax foundation does get brittle in cold temperatures. So for your own comfort and to avoid later slackening of wires and breakage of foundation do the job at room temperature. It is wise to have your parcel or box of foundation set in a warm place for a day or so: it becomes much more pliable.

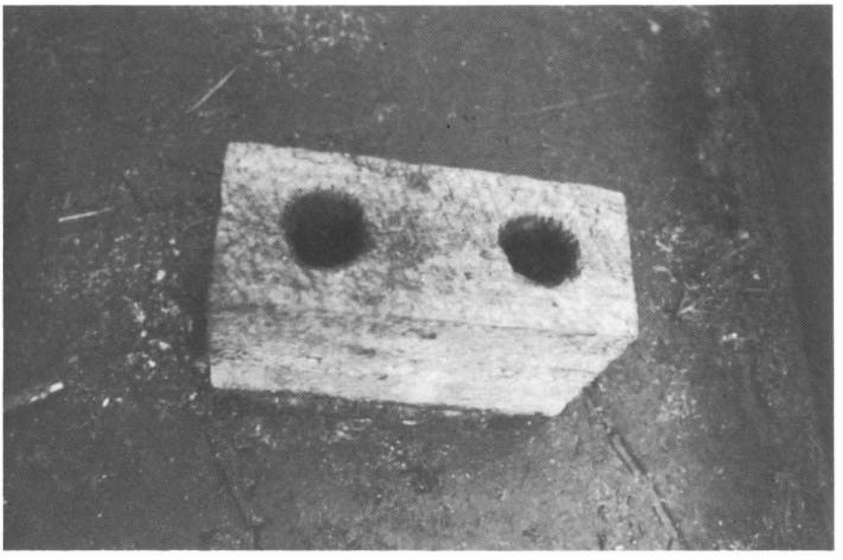
Some of your other gear may need some attention. A nail here or there. Cut out a rotten piece from a super. When it is a bottom edge cut out the whole length and replace. Be accurate or you will find gaps. A full depth can often be cut down to ¾ depth. When supers are painted keep that protective coat in good order. It preserves and looks better. It all means a stitch in time saves nine. And that is a consideration seeing the prices of equipment.

If you don't count your time you can certainly save money by making some equipment yourself. It is also a challenge and an extention of your hobby, if beekeeping is that to you. If you do have a good home workshop with the right tools (in good condition), and

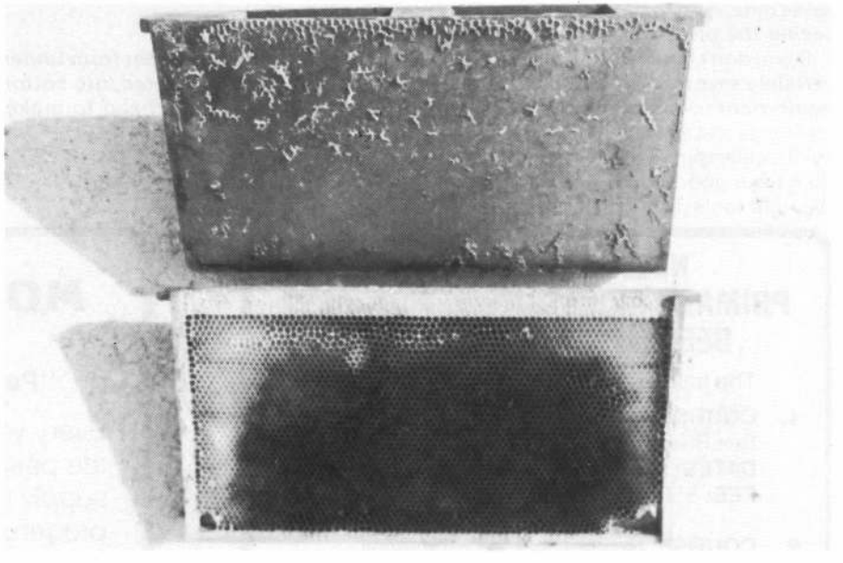


The same feeders as seen from underside. The left shows the two slats (25mm wide 12mm thick) slotted into bottom edge of cut down super. The feeder with the tins is easy and cheap to make.

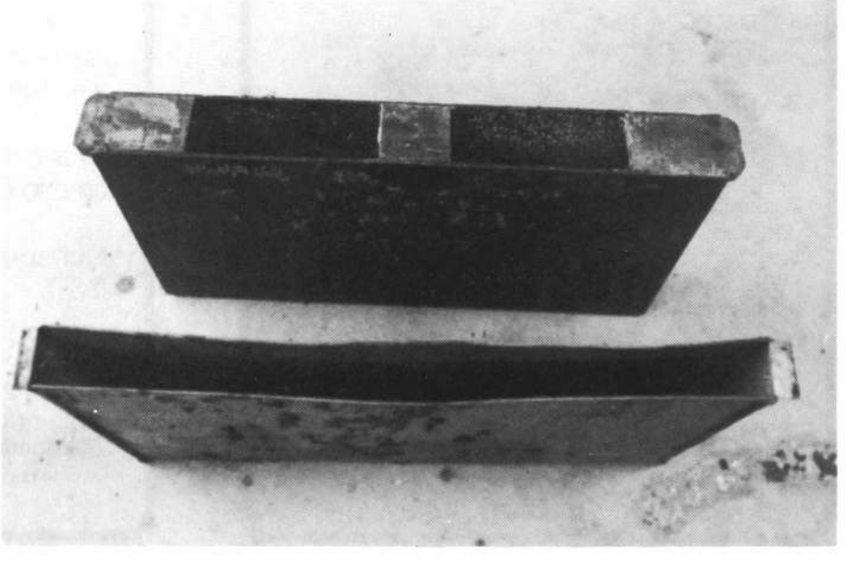
Close up of block. Auger the holes first through the block. Then glue and nail to hardboard bottom. After that bore the holes through the hardboard. Flotation used is pine needles. Clean and plentiful. This type feeder for quantity.



This type feeder inside the brood chamber takes the place of two combs, leaves room for eight combs comfortably. Comb underneath for comparison. Bottom and sides made from 45 x 10 mm slats. Glued and nailed. Lugs and centre piece of same. Hardboard sides glued and tacked. Waterproofed with parafin wax. Extra wax to be run along inside seams. Wax for final seal not to be too hot so that it congeals quickly to form a good skin.



Different view of same and for those who are handy with a soldering bolt one made of tin (G.I.). These feeders have a capacity of approx. 4 ltr. For flotation we use thin flat pieces of wood, other material will do the job just the same.



you like woodwork, you are halfway there. Use well dried timber for nothing is worse than warped boards which later develop gaps. Wood preservatives too don't work on timber with a too high moisture content. Dressed timber makes for greater accuracy. For making bee gear we can often use short lengths which may be available cheap. Shop around. However, I don't think you can expect to turn out a better product than that bought from a good manufacturer. I don't think it wise to tackle the item you need the greatest number of, namely frames. To do this you will at least need a good saw bench and a buzzer. There are so many cuts to made and shaping to be done in making standard frames that it only pays if you do really big runs at the time. Hofman frames are especially difficult, Manley frames are somewhat simpler. I certainly would not advocate some of the so-called simplicity frames. Better buy your frames and spend your time otherwise.

Supers can be considered. Check the corners, taking a short cut by just butting does not make for a satisfactory job. Again accuracy is important or you will have badly-fitting gear with all its consequences.

Andrew Matheson's book gives all the standard measures for equipment. Stick to it and you will have no trouble with inter-changing.

Try your hand at making a feeder.

N.B. When feeding syrup to colonies remember it will exite them and can lead to robbing. Make sure there are no gaps for evil doers to enter through. Feed towards evening if you can.

As the allotted space for this column will be filled by now, further equipment must wait till the next issue.

I hope both you and your colonies will winter well.

Coffee jar feeder. Hole in inner cover slightly smaller than lid of jar. This lid shows only five little holes (frame nail) and is meant for just a slow drip feed to keep a breeder colony happy. More holes will of course speed up the process. Small capacity and slow, will boost breeding. An empty super is placed on the inner cover, then roof on top.

A Successful Prosecution

On October 3 last year Mr Dave Grueber, Apiaries' Inspector, Blenheim, received a phone call from a beekeeper informing him that old boxes of bee comb and other hive gear had been dumped at the local Blenheim refuse dump and that bees were robbing old honey.

Mr Grueber found 36 boxes of old hives lying about. Inspection showed the old brood frames were likely to be infected with American Foul Brood disease, although approximately 98% of the symptoms were reduced to scale.

Numerous bees had access to the hives and were seen to be robbing the honey and pollen from the old frames.

Two major flight paths were used by the bees who were obviously coming from two nearby apiary sites: one being a queen-breeding site.

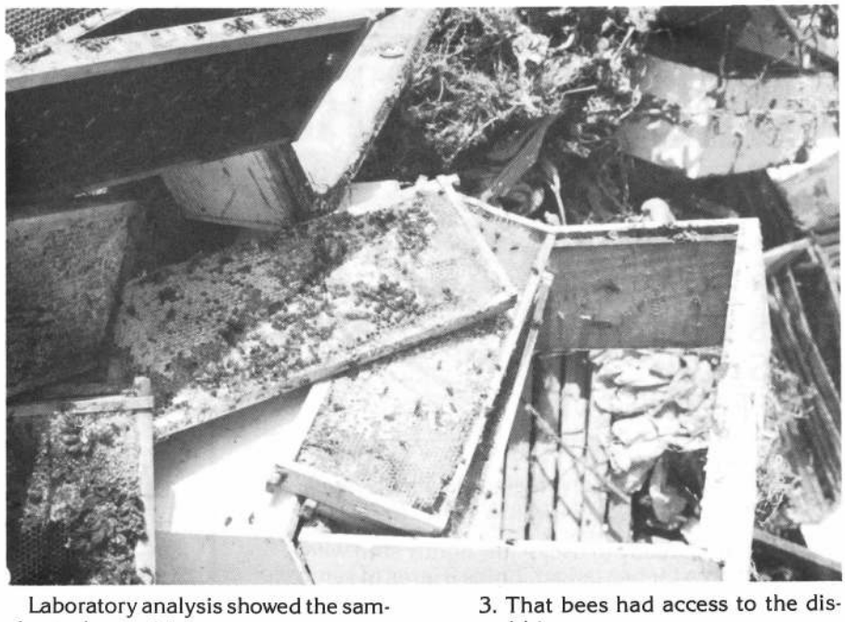
Mr Grueber estimated the number of bees involved in the robbing to be consistent with that found in a normally healthy and flourishing hive of approximately four full depth boxes in height.

Some of the boxes had a Registration No L868 printed on the sides but it was difficult to trace the owner by this registration number as it was a Canterbury number, cancelled many years ago, and did not appear on the local register.

However enquiries revealed that a Mr Thomas of Blenheim had dumped the hives earlier in the day. Mr Thomas could not be contacted immediately. As Mr Grueber suspected a schedule disease he dealt with the matter by burning; using his authority as an Inspector under Apiaries Act 1969.

Mr Grueber later interviewed Thomas who was asked why he had dumped diseased hives in such a manner. Thomas stated that he had cleared up a mess of hives at one of his sites and put them with other dead hives in his garage. The hives had become a nuisance in his garage so he had dumped them. He was not aware that the frames were diseased. Thomas said that he had asked the refuse tip manager to cover the hives for him.

Mr Grueber informed Thomas that he had taken samples from the hives for laboratory analysis and confirmation of AFB disease. If these samples were shown to be positive then he would apply to prosecute Thomas under Section 20(1) of the Apiaries Act 1969.



Laboratory analysis showed the samples to be positive.

Mr Grueber applied to prosecute Thomas and the case was heard on Tuesday 23 March, 1988. Thomas' defence was that he had not realised the hives were diseased and they should have been covered up.

Technically three points had to be proven.

1. That Thomas dumped the hives.
2. That the hives were diseased.
3. That bees had access to the diseased hives.

The ruling Judge said that Thomas had been grossly negligent and fined him $500.

Mr Grueber said that the initial feeling from the local apiarists was that the fine was not high enough considering the potential disease risk but after he attended the local annual general meeting and talked to beekeepers they accepted that justice had been done. The important aspect was not the amount

of the fine, but that the inspectorial system and the Apiaries Act were adequate to deal with incidents such as this. This case also reInforced MAF's commitment to safeguarding primary industry from the spread of endemic disease or the introduction of exotic disease which would wreck an industry such as apiculture.

Solar reflective surfacing for roofs

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It is particularly useful on commercial projects involving large roof areas, when heat gain can be significantly reduced, thus reducing air conditioning plant size and lowering operating costs. Re-application is only required approximately every seven years.

"With butter, egg and good honey
Your cake will moist and flaky be."

"If I had all of Croesus' money
I'd still subsist on bread and honey."

Tracking Tastes in World Food Markets

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Between September 25 and October 24, 1987, the New Zealand Market Development Board organised and partly funded a world tour for food technologists. Thirteen people joined the Global Food Tour including Dr Peter Kettle from MAFTech.

The object of the tour was to give food technologists a view of the world scene in food marketing. The tour conincided with the Seventh World Congress of Food Science and Technology, held in Singapore, and the ANUGA Food Fair in Cologne.

As well as Singapore and West Germany, the tour also took participants to markets in the United Kingdom and California.

In his report on the tour, Peter Kettle, MAFTech's national manager for animal research, listed some of the major trends in Western food markets:

- Taste has become of overriding importance for all food. This contrasts with the situation a few years ago when high fibre food became very popular, regardless of taste, because of anticipated benefits to health.
- Health trends are towards less meat and lower intakes of fat, sugar and salt. There is widespread concern about preservatives, dyes, flavour enhances and residues. Fresh fruit and salads are increasing in importance.
- Quality is usually more important than price except for the hotel, restaurant and institution market.
- There is a major trend towards eating out. Fast food is becoming particularly important with a growing emphasis on ethnic restaurants.
- Convenience foods such as microwaveable single portion meals are becoming very popular.
- Distinctions in local cuisine are being broken down as exotic foods are accepted and become part of the local scene. There is a merging of tastes in food as populations become more mobile, intermingle and intermarry.
- The variety of foods available is increasing at a fast pace as people strive to introduce new products to the market.
- Indulgence, associated with diet consciousness, is a recent trend. Dieters are rewarding themselves with luxuries such as chocolates, marzipans, high quality ice creams and dairy desserts following a period of restraint.

Terry Greatrex discussed with Peter Kettle the implications of these trends for New Zealand's food production and export efforts.

AgriSearch: How must New Zealand primary industry change to suceed in the international marketplace?

Kettle: The first thing we must do is to develop an image for our different primary products. New Zealand as a country always seems to invoke adjectives like "clean", "beautiful" and "green" but people don't seem to associate it with food. They associate it more with being a nice place to live or to visit.

We've been in the commodity market for a long time but there appear to have been problems with providing a consistent product.

Also, some of the people we spoke with made the point that we don't have to go to the top end of the market with all our products. For example, while we might be putting high-priced cuts of venison into Germany, there may be a market in the hotel, restaurant and institution area in the United States for meat for game stew and similar dishes. This particular market is enormous.

In any case, the aim is to deliver a consistent product so that we get consumer allegiance to our brand name.

AgriSearch: Are you saying we needn't aim for the top of the market?

Kettle: No, I'm not suggesting we don't aim for the top. But I don't think it would be wise to ignore these other areas. That is why I used venison as an example. The same could be said for lamb cuts. We could go into the top end of the market with specific cuts but also have other outlets for less expensive cuts. It is a matter of identifying the market niches.

But we must have a New Zealand identity rather than having different meat producers, for example, going over there and trying to undercut one another.

AgriSearch: At ANUGA, which countries did you see marketing themselves with a country brand?

Kettle: There was a very good effort by Britain to promote Food From Britain. There was also a Food From Greece promotion. The Americans, of course, were flying the flag high but they were more divided into state brands.

There are places like Switzerland and Denmark from where you expect the food to be spot on. The French have a pretty good name as well. The stalls from these places identified very closely with the respective countries.

And, as far as the clean, green image goes, we are not the only ones pushing that. Ireland is also adopting that approach using virtually the same gimmicks we are.

AgriSearch: What was the effect of the Chernobyl incident on the perceptions of food from different countries?

Kettle: The most interesting point that arose about Chernobyl was raised at the Singapore Congress. A Swede gave a talk there and I was surprised to find that people accepted after a while that, although radioactive levels were high in some foods, they could be eaten safely at certain intervals of time, say once or twice a month.

Brochures were sent to all the homes giving the radiation levels of different foods with guidelines on how often each food could be eaten. I found that very interesting because I would not have thought anyone would touch anything that was so highly radioactive you could east it only once every few months.

It looks as though things are returning to normal fairly rapidly in Sweden.

In the restaurants in Germany, it is now usual to state the country of origin and species of venison. So New Zealand Red Deer is stated rather than venison which may have been some sort of game animal from South Africa or anywhere.

AgriSearch: How quickly are trends in our overseas markets changing and how quickly must we adapt to meet the changing needs of our customers?

Kettle: It is hard to say exactly how fast trends are changing but all the evidence suggests that the move towards healthier foods will continue for a long time. Moving towards natural foods is probably the way that the western world will continue to go. It can afford that indulgence; the starving part of the world can't.

AgriSearch: Are we equipping ourselves to cope with that trend?

Kettle: Yes, we certainly are. An example is the Dairy Board subsidiary Dorman-Roth producing "Lite" cheeses which are low in fat and salt. On a more experimental scale at the moment, MAF's involvement in developing standards for organic produce is in keeping with world trends.

It is hard to say how far that will go. I don't think people will worry about completely organically grown products—the biological farming concept — but they certainly are wanting to be reassured that intervention through chemicals is kept to a minimum.

AgriSearch: How is this trend going to affect people's perception of something like irradiation of food?

Kettle: Irradiation is something we should be looking at very carefully because all of the evidence available suggests it is a very safe way of treating food. It is not a magical method but it is safer than using methyl dibromide, for example.

The point was made on the tour that probably everybody in Britain eats irradiated food at least once a year. The same is probably the case in the United States although that is a little less clear cut.

I would see that it's very likely, if San Francisco has an outbreak of food poisoning from crabs or some other crustacean, irradiation could be introduced for that kind of food. This kind of policy change occurred in Holland where people died after eating contaminated shrimps.

WHO and FAO gave irradiation a clean bill of health some years ago. They said at the time that there was no need to do further research to assess whether it was dangerous or not.

AgriSearch: Turning to the quite different issue of growth promotants, where the primary purpose is to increase production from the land: will we never be able to use these in exported meat?

Kettle: That was the impression I got. While there is no scientific evidence to suggest that growth promotants in beef are in any way harmful, because the levels of hormones are not above those that can occur naturally, the political reasoning is that there is not much sense in using a system of increasing production where you already have drastic overproduction.

I think it is also fair to say that some people are developing a deep distrust of science. There are concerns that people don't understand what is going on, that they are suspicious of science. And in the animal area they are becoming more and more conscious of their ethical stance regarding animal welfare. We have got to take all these things into account.

AgriSearch: These things could be taken as market signals. For a country that is promoting itself as clean and green, is there really any place for growth promotants in New Zealand?

Kettle: I would say that we could do without growth promotants. It would be to our advantage to stick with the image of pasture-grazed, natural and pure product.

AgriSearch: What will be the main difference in five or ten years time in the research emphases in meat production?

Kettle: We need to produce meat which has less fat. We need to produce animals which have a consistent conformation so you can cut off portion-controlled cuts. There is also the chance we might be able to modify flavour. For example, a key to cracking the valuable Asian market would be to eliminate the mutton smell. There would be every chance of selling a great deal of lamb to China.

Library Notes

Some interesting items to enter into your catalogue:

BREEDING THE HONEY BEE by Brother Adam. 1987, 118 p, UK, offers the average beekeeper and queen breeder an insight and understanding into what breeding means and involves. It is not just about queen raising but takes us to the very basis of selective breeding. It is also a record of Brother Adam's life-long involvement with observations and experimentation in this field. The book is in three parts covering Theory of Breeding, Practical Possibilities, and the Evaluation of Breeding Possibilities of the different races. Language used and clarifying diagrams make it one of the most understandable books on this complicated subject. Complicated, for even if Mendel's Laws do apply to honey bees, allowances have to be made for parthenogenesis and multiple matings. Highly recommended. Your opportunity to extend your knowledge and understanding of this most intriguing matter.

THE BIOLOGICAL CONTROL OF GORSE IN NEW ZEALAND, AN ENVIRONMENTAL IMPACT ASSESSMENT by Richard Hill and Dr. R. Sandrey, DSIR. 1987, NZ. A very full report about the systematic research, the consequences to the different interested parties, the advantages and disadvantages. All aspects of biological control seem to have been considered. The decision to allow this type of control was certainly not taken lightly. As it was, and still is, a point of controversy to many a beekeeper it is good to have this report in the library and available for reference.

MAF. TECH. SLIDE COLLECTION. This wonderful collection of 68 slides has come our way for the enjoyment and education of I would say everyone, not just beekeepers. The basis was laid by our late beekeeper friend Herman van Puffelen of Waitahuna, Otago, who was a very patient and excellent photographer. The collection has been dedicated to him. Other contributors are Messrs J E Squires, M Schrader, and R F van Toorn who also compiled the collection. The slides pretty well cover the life cycle, the tasks of the bees within the hive and outside it, as well as anatomy, pollination, communication and navigation, diseases, and predators. An explanatory text is included with these slides.

A real must for branch or Club evening, schools, etc.

Hire charge for this item will be $5, which is little considering the value involved and the small contribution asked from every member of a viewing party. Postage both ways of course for the borrower.

John Heinman

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OTHER PUBLICATIONS

INTERNATIONAL BEE RESEARCH ASSOCIATION (IBRA)

IBRA is a charitable trust providing scientific and practical information on bees and beekeeping worldwide. All members receive BEE WORLD. For full details of IBRA services and Membership contact: International Bee Research Association, 18, North Road, Cardiff CF 1 3DY, UK, Tel: (0222) 372409 or (0222) 372450 (ansaphone), Telex: 23152 monref G 8390.

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What do you know about the INTERNATIONAL BEE RESEARCH ASSOCIATION? The many books and other publications available from IBRA will deepen your understanding of bees and beekeeping: an IBRA membership subscription — inclusive of *Bee World*, a truly international magazine published quarterly in the English language — will broaden your beekeeping horizons. Details from IBRA voluntary representative for New Zealand, Trevor Bryant, Ministry of Agriculture and Fisheries, Private Bag, Tauranga, New Zealand; or from International Bee Research Association, 18 North Road, Cardiff CF1 3DY, UK.

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