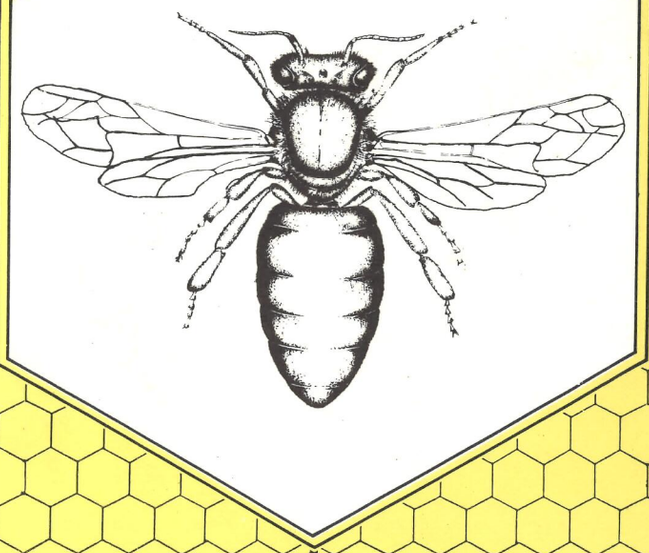

BAY OF PLENTY POLYTECHNIC
LIBRARY

beelines

Number 35 May 1988

MAF Tauranga Andrew Matheson Apicultural Consultant

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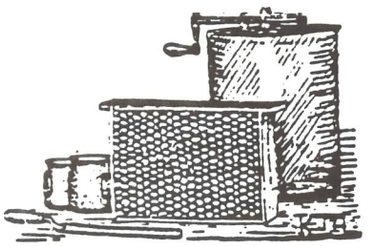
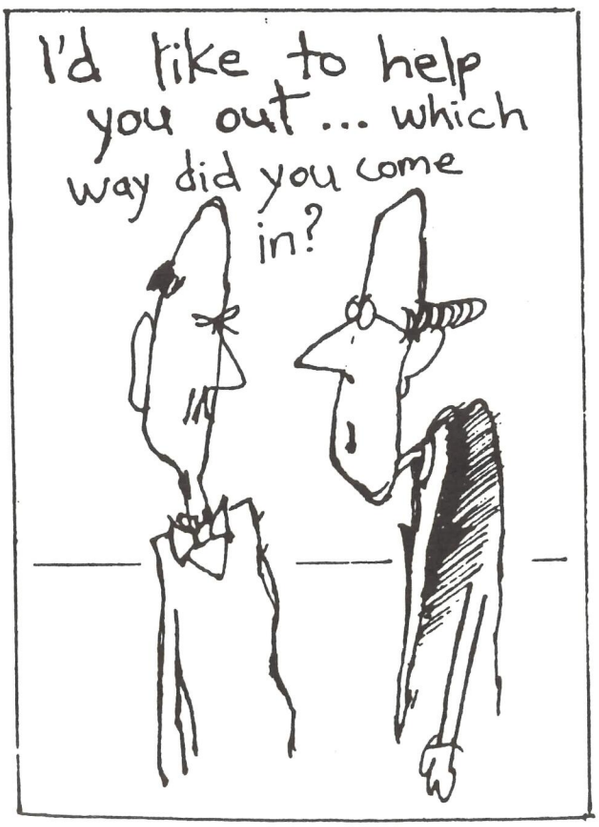




There's been a lot of discussion over the past few years on how to fund the disease control programme for your industry. There will be a lot more before this is all over, and the industry conference next month will probably be one of the most important ever.

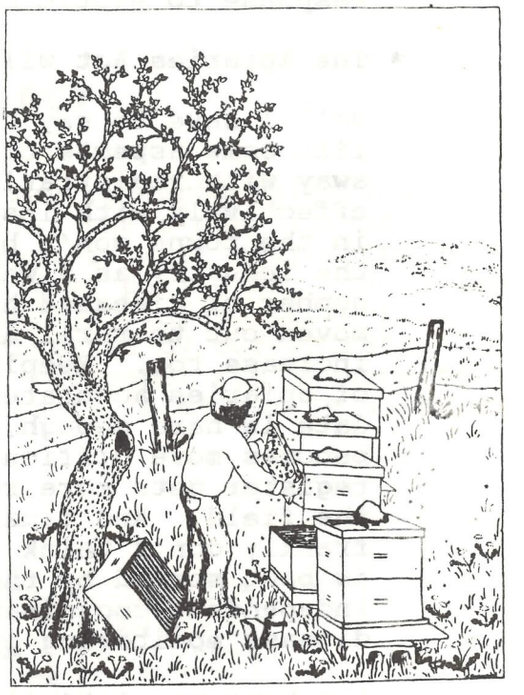
The options have been well canvassed among hive levy payers, and there are about four in the finals:

* All costs to be borne by levy payers.

* Costs to be shared among levy payers (about 55%) and the Government (making a "public good" contribution on behalf of hobbyists, as recommended by the minister in 1986).

* Funds to be raised by a standard fee for every beekeeper (previously rejected by the minister because of its inequity). Will increase numbers of unregistered and possibly also diseased hives.

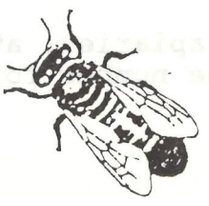
* No money to be raised, and MAF's service to lapse. MAF has been accused of scaremongering over this issue, but the fact is that if the beekeeping industry collectively finds itself unable or unwilling to fully fund the disease inspection part of MAF's activities, our managers will take that as a clear signal that MAF input into beekeeping is not valued and consequently MAF expenditure on beekeeping servicing in any category could no longer be justified. The result would be a rapid rundown in MAF's beekeeping expertise and capability by redundancy and redeployment.



Think very carefully before voting on remits one way or another. The cost of the second option is about 0.5% of a beekeeper's turnover, which represents cheap insurance against a rise in disease levels.

Another proposal is going around branches at the moment, promoted by Mike Stuckey of Auckland. The main points of it are:

* Register apiaries only in rural areas - forget about towns and cities.



* Keep one apiary register (for rural areas) at the NBA offices in Wellington.

* Have only two apicultural advisers, one in each island.

* Retain MAF's agricultural quarantine service.

* Continue MAF's bee disease diagnostic service.

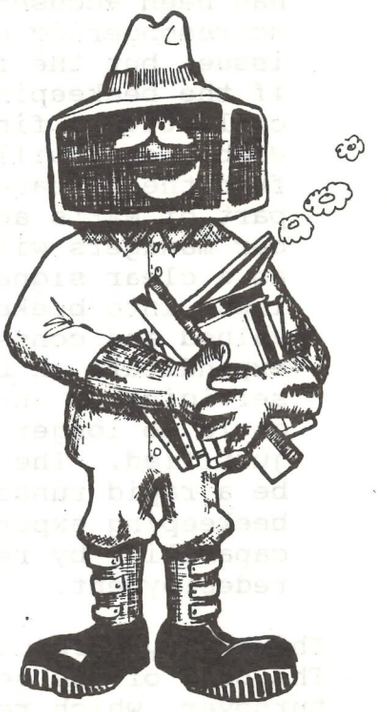
* Apiary inspection to be done entirely by beekeepers, who are selected by local branches.

* Local branches will decide which apiaries to inspect.

* The beekeeping industry will participate in MAF's emergency response to exotic bee diseases.

* The Apiaries Act will be retained, albeit in a modified form.

Well I have to say that I don't like some aspects of this. Doing away with registration (and effectively with inspection too) in the towns won't be good for the industry as a whole. The number of diseased hives sold or moved out to rural areas would increase too. Keeping a register of apiaries accurate and up to date is hard enough, but it becomes more difficult as the register gets more remote from the field. And finally, I frankly don't think the industry is best served by the loss of independent coordination of a disease monitoring programme.



But hang on, let's look at this proposal carefully! Mike has made some very good points that I wouldn't want beekeepers to lose sight of:

* AFB control is the beekeeping industry's responsibility, not MAF's.

* NBA branches should play a part in offering part-time inspectors, reporting problem areas for inspection, advising updates to the register and disease occurrences.

* Beekeepers should identify their apiaries, at least with their code number or maybe even a unique number for the site (such as D1234/22).

In the Bay of Plenty we are about to formalize communication channels at branch meetings for:

* Beekeepers to report to MAF possible disease problems, unregistered or abandoned hives.

* MAF to report to beekeepers AFB incidences where spread is likely, and other relevant items.

A lot of things that Mike raised are already happening. We have an inspection manual for part-time inspectors. AAOs do coordinate a team of PTIs and issue warrants. We already have an emergency response manual (for exotic disease outbreaks), and branches are involved. We are committed to retaining border quarantine protection and a disease diagnostic service.

* * * * * * * * * *

YOUR DUTIES UNDER THE APIARIES ACT

Following on from that discussion, it may be worth reiterating what responsibilities beekeepers have for their **own** disease control. Anyone who stops to think about it will realise that the Apiaries Act, while doubtless an act of parliament, is really the beekeeping industry's **own** best means of disease protection rather than a punitive law to be administered by bureaucrats. It's actually just a formalized set of beekeeper and government behaviours which, if followed, would result in effective disease control.

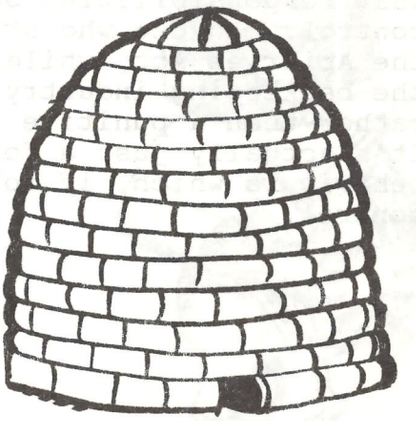
When you look at it this way it's obviously in everyone's best interest to play by the rules. And yet to a greater or lesser extent many beekeepers, well-meaning and otherwise, sometimes fail to carry out all the prescribed activities called for under the act. For most people such laxness doesn't appear to be serious; but the result, particularly in the case of a major disease outbreak, could be disastrous for the industry as a whole.

So with the new season about to get underway and in the interests of all beekeepers, large and small, here's a "Back to Basics" primer on your duties under the Apiaries Act 1969:

* **Apiaries to be registered** (Section 4). Anyone who keeps bees in any location for more than 14 days is required to register that location (permanent or seasonal) with the apiary registrar, MAF. This means that waiting until inspection return time is **not** following the rules. Application forms for registration are available from any office of MAF, or you can simply write or phone in.

  Pollination sites should be listed separately and advised to MAF before the hives go in.

* **Registrar of apiaries** (Section 4(6)). All registrations of apiaries are kept in an apiary register for the district. While in the past this register was updated manually, now computerized registers have improved speed, accuracy and disease control. It should be remembered that all apiary registers contain privileged information and no private individual is entitled to search the register without permission of the Director-General, MAF.



* **Identification of apiaries** (Section 5). All beekeepers are issued with a code number the first time they register an apiary. To aid in apiary identification each apiary registered by the beekeeper is required to have that code number clearly marked, either on one or more hives or on a marker post or sign. This is probably the single most disregarded section of the act, and yet it is one of the most important requirements relating to apiary identification and disease control.

* **Information to be supplied to registrar** (Section 6). If you sell or cease to occupy a permanent apiary, or buy an apiary

already registered by someone else, you are required to notify MAF of the change within 14 days.

* **Abandoned or neglected bees and beehives** (Section 10). If a warranted inspector finds abandoned beehives or apiaries (it happens more often than you might think!), in the case of a registered apiary s/he may direct the beekeeper to dispose of the hives within a specified time. If the beekeeper fails to comply the hives will be destroyed by MAF (and a bill sent). In the case of an unregistered apiary the hives can be destroyed forthwith.

* **Outbreak of AFB** (Section 18). This is the section which outlines the annual statement of hive inspection system. Note that the return should be sent back as soon as the spring inspection is completed. (The date of 7 December is the latest possible).

* **Notification of AFB** (Section 18(1)). Beekeepers finding AFB at any time during the season must immediately send written notice to MAF as well as eradicating the disease. If you wait until you send in your inspection return you are not complying with the act!!!

* **Dealing in diseased bees** (Section 20). Hives from apiaries where disease has been found cannot be sold or given away within 28 days of disease discovery, without written consent of the inspector. The inspector can also quarantine hives on site for a period of up to three months.

It's a good idea to be familiar with the provisions of the Apiaries Act. Copies of the Apiaries Act 1969 can be obtained from any office of the Government Printer or "Books a Plenty" in Grey Street, Tauranga. Last year the act was reprinted with amendments incorporated, so you don't have to keep referring to other bits of paper. Remember - It's your act. Use it!

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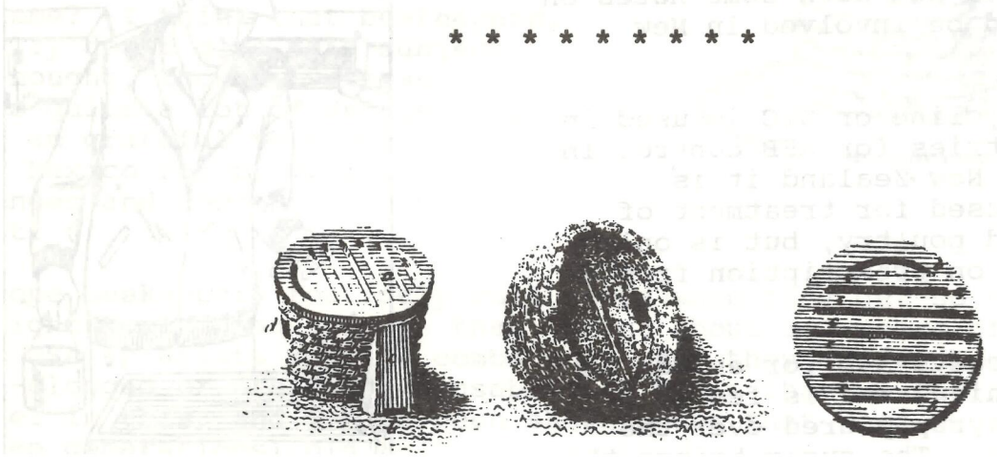

FREE POSTERS

I still have stocks of the "Bee legal, bee registered" poster, as well as the Hilda Hislop story - that's about the dangers of importing honey. If you can use any of them let me know.

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MOTHS ON THE MOVE

It's time to be putting supers into stacks and putting a handful of moth crystals on top. Be careful what you buy. "Mothballs" must not be used - they contain naphthalene which gets absorbed into the wax and can caused bee deaths. The right stuff to use is PDB or paradichlorobenzene, sometimes sold as "wax moth crystals".

Check your supers every month or so, and replenish crystals as needed. Air the boxes in an open stack for a couple of days or so before putting on hives.

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DRUG FEEDING FOR AFB CONTROL

With all the talk going on about what drug feeding would mean, I thought I'd set down some notes on what would be involved in New Zealand.

Oxytetracycline or OTC is used in some countries for AFB control in bees. In New Zealand it is commonly used for treatment of calves and poultry, but is only available on prescription from a vet.

The drug costs 33c for enough to dose one hive, and is fed in dry sugar or syrup poured over the brood nest. The sugar brings the price up to 53c per dose, and at two doses per year that's $1.06 per

hive per year. This costing assumes that treatment takes place during normal hive management, and that no extra visits or equipment are needed.

Importation, sale and use of animal remedies are limited by legislation. The Animal Remedies Board would probably want approval for the use of OTC to remain with vets, though they would probably just act on an apicultural adviser's recommendation.

If drug feeding were introduced for AFB control, eventually most hives would have to be fed on a routine basis. This would cost the industry over $350,000 per year for materials only. There would be other direct costs such as additional analysis of honeys for overseas markets, and indirect costs such as the loss of one of the few marketing advantages we do have for honey - New Zealand's clean, unpolluted image.

(Acknowledgement: this article is based on notes prepared by Derek Bettesworth, MAF Whangarei.)

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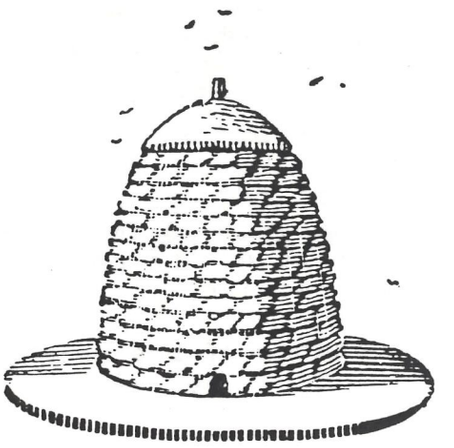
TIME FOR COMB CULLING

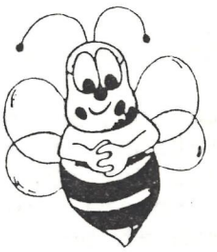


How much foundation do we need to use for comb replacement? Do we need to replace combs only when they fall apart, or should we put hives on a routine comb-replacement programme? I think that beekeepers generally don't give this subject much thought, though overseas there's quite a lot of debate about it. I am grateful to Elbert Jaycox of New Mexico for providing references and comment on the subject.

In Europe beekeepers routinely cull combs when they get so dark that light won't pass through them, after about 3-4 years of use. In the USA apiarists replace combs only when they are broken, pollen-clogged or otherwise unusable. I guess that we follow the US model in this, and I have been shown combs that were decades (or even generations) old.

There is quite a lot of scientific evidence which suggests we should replace brood-nest combs frequently.

* **Chalkbrood incidence**



Old comb contributes to the development of CB, most probably by acting as a reservoir for spores. This can be shown by establishing three groups of colonies, one on white combs and foundation, one on old combs and the other on old combs that have been fumigated with ethylene oxide (which kills CB spores). The group on treated combs had only slightly more CB than the hives with whites, whereas the colonies with dark combs had over five times as much.

There's also evidence to suggest that, as well as encouraging the buildup of spores over time, old combs contain nutrients that actually accelerate fungal growth.

* **Nosema**

As well as acting as CB spore sources, old combs also allow *Nosema apis* spores to accumulate.

* **Cell size**

I must admit I've always been sceptical of the argument that the buildup of pupal cocoons in cells leads to smaller cells and smaller bees. I mean - if you wallpaper your hallway often enough you'll have to walk sideways to get to the other end of the house!

But there is evidence to suggest that bees reared in old combs are smaller than those from new ones. Different studies have shown weight reductions of 8%, 12% and 22% from old combs. The cell size may be an important factor in determining the ultimate size of the bee, perhaps by altering the amount of food they receive.

The importance of bee weight is clear - heavier bees begin to forage up to a week earlier than light ones, so should gather more nectar.

* **Brood nest management**

Dr John Free, formerly of Rothamsted, says that in feral colonies brood rearing moves into new combs, and old combs are used for honey storage. Under artificial "management" brood rearing is confined largely to old combs. This leads to packing out of the brood nest with honey and probably increased swarming.

Okay, that's fine, but what about the costs of culling comb? For every super of combs culled, an efficient steam rendering unit will recover about 1.7 kg of wax. On carton lots you can have that converted to 30 sheets at a cost of $3.30. So you can see that there is no material cost in replacing combs with foundation; it actually generates a profit. What you do have to analyze is the labour content.

When using foundation you have to make sure the bees treat it properly. Put new frames in the bottom box and they won't be drawn down to the bottom bar. Put them in the second box or, better still, in a honey super, and do it only when there's a flow on or the bees are being fed. Use 10 frames per box, and bait any supers that are mostly foundation, with a couple of juicy combs that are already being worked.

The evidence suggests that you should strongly consider getting rid of the old combs in your hives. You won't be able to do it all at once, and three combs per hive per year is a good basis for a routine replacement programme. You might also like to consider comparing hives containing no black combs with those that do. This might all be quite a big programme, but stronger colonies, better wintering, less disease and light-coloured honey are all worth striving for.

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WILLOWS

Contact the National Plant Materials Centre at Aokautere, Palmerston North for willow cuttings. (They used to be part of the Ministry of Works, but I'm not sure who's got them now.)

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

Clone	Species	Sex	Average flowering period
229	*Salix medemii*	M	15 July-17 August
215	*S. discolor*	M	14 August-9 September
227	*S. matsudana*	F	2 September-21 September
1130	*S. matsudana x alba* 'Hiwinui'	M	29 August-27 September
220	*S. viminalis* 'Gigantea'	M	4 September-1 October
249	*S. purpurea* 'Booth'	F	7 September-5 October
1040	*S. matsudana x abla* 'Tangoia'	F	18 September-8 October
717	*S. triandra* 'Semperflorens'	M	1 October-7 April

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REDUCE YOUR INTEREST RATES

Federated Farmers are mounting a concerted campaign to reduce interest rates. They say that bank managers have discretion in setting rates because margins vary from 1.5% to 5% above base rates.

The Federation is suggesting that farmers must use their collective strength to obtain meaningful reductions, and there's no reason that beekeepers can't join in too.

They suggest six pointers for improving your chances.

Make an appointment. Lenders are busy people and so are you. Make an appointment so you won't be wasting their time and yours.

Plan and prepare. Draw up a clear, accurate budget plus a cashflow showing the cash state of the business during the difficult months of the year. Draw up a balance sheet of your current assets and liabilities so you and your lender know what your equity is. In some cases this might mean you will require a current valuation.

Consult. To feel comfortable and certain about your facts and figures consult your accountant or other professional adviser. It is essential that your figures stack up.

Be confident. Be confident in your approach to your current lender or a new lender., If necessary rehearse your approach several times to improve its delivery. Remember lenders need us as much as we need them. They are business people like you and will appreciate a business-like approach. It may be appropriate to get your lender to visit your property so they can see first hand how you plan to manage their investment.

Keep trying. If you are unsuccessful the first time don't give up. It may take several meetings and you may have to approach regional or head office bankers. If you have a good case there will be a lender who offers you a lower rate of interest because they want you as a client.

Use your industry organization. Use your local NBA branch as a forum for swapping ideas, or for making an approach to targeted bank managers. Get alongside your Federated Farmers provincial office to see if they can help.

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DISEASES CARRIED IN HONEY

We all know that honey is pure and natural, and has long been used as an antibiotic. How then can it also carry diseases?

Many of the diseases that affect bees are not killed by honey's antibacterial action - that's probably a prerequisite for becoming a bee disease. The organisms that cause AFB, EFB, chalkbrood and nosema disease have all been found in honey. Spores of Bacillus larvae, the cause of AFB, can cause disease after more than 35 years of storage.

While none of these organisms affect human health they can have serious consequences for beekeepers' wallets, as honey is a potent method of spreading diseases.

AFB

Honey taken from hives showing AFB symptoms has a staggering level of BL spores - 4.5 million per gram. As it may only take 10 spores to infect a young larvae, that will go a long way.

A survey in Denmark showed that 23% of Danish honey samples and 81% from overseas contained BL spores. There is, though, no evidence to suggest that New Zealand honey has the same level of AFB contamination.

We know that honey in a hive may be contaminated with BL spores, and adult bees can carry some spores on their bodies, without there being any symptoms of AFB in the colony. This is especially true in apparently healthy colonies in apiaries where some hives are showing AFB symptoms.

It is fortunate for us that these sources of infection in seemingly healthy hives do not always develop to diseased status. This is so because a certain threshold dose of BL spores is needed in a colony before disease symptoms develop. This critical dose is 50 million spores in a litre of honey (but remember how many spores there are in just one gram of honey from a diseased hive).

A number of factors will influence the initiation of AFB in a colony, such as hive strength, brood/bee ratio, strain of bee, nutritional status of hives and seasonal conditions. Don't, though, use these facts to hide behind the facile argument that "BL is everywhere, in all hives, so whether the hive goes down with it is beyond my control". The vast majority of AFB spread is directly attributable to beekeeper management.

Honey and other diseases

We know that EFB is spread through honey, and many of the 40 honey samples intercepted at Auckland airport each week could be carrying the bacteria which causes this disease.

Nosema apis, the cause of nosema disease, and the fungus which causes chalkbrood are also transmitted in honey.

What can you do about it?

* Examine brood nests regularly. If you are unsure of what you see, contact me or send a specimen to be diagnosed at Lynfield.

* Never feed honey to a hive, unless you can personally guarantee that it came from a hive without symptoms of AFB.

* Don't leave honey or supers where bees have access.

'I was rather hoping you would ask me that. Yes . . . and no. I think it really depends on how one views the broader implications. Looking at it objectively, what was the question again? . . .'

BURR COMBS - BITS AND PIECES FROM ALL OVER

* MAF's apiary register program has been selected from more than 80 entries for the final round of an international software competition.

* During 1987 honey was intercepted 2034 times from passengers arriving at Auckland airport: that's nearly 40 times a week. The honey originated in 24 different countries.

* Canada has ordered 5 000 x 2 kg x 2 queen packages from West Australia.

* UK agricultural authorities have agreed to accept bees sent on both TE2 via Los Angeles and TE2 via Honolulu. The conditions imposed are that:

  - the aircraft stops only long enough to refuel

  - the mail bags containing the bees do not leave the plane

  - the queen cages are enclosed in a bee-proof mesh mailbag.

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LIVE BEE EXPORTS

New Zealand's exports of queen bees and packages have been well down on the initial estimates made when the US-Canada border closed. The reasons include:

* The depressed state of honey prices (and beekeeping) in Canada.

* Increased self-sufficiency through overwintering of hives, and nuc, package and queen production in British Columbia and southern Ontario.

* Efforts by some sections of the Canadian industry to re-open the border, resulting in firm orders being received too late.

Cyclone Bola blew away much of our production, and although this was beyond our control any inability to supply may be used as ammunition by those who want the border opened.

The Canadian government is paying subsidies to beekeepers (called "deficiency payments") which will help with the extra costs of buying in packages. The payments vary between provinces according to a complicated formula, and range from $C4.90 to $C10.26 per package. The prairie provinces are mostly around the $9-10 mark.

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VARROA

The American beekeeping press is chockablock with varroa stories at the moment - and who can blame them for being worried? The latest is:

* The mite has been found in 13 states; from California in the west to Maine in the east, and from Florida in the south to Wisconsin up on the Canadian border. This wide and scattered distribution confirms that by the time varroa is found, it's usually been spread over a large area.

* Beekeepers are having some success controlling (not eradicating) mite populations with the pyrethroid miticide fluvalinate. Approval has been granted for the use of impregnated plastic strips to be inserted in hives in spring to minimise varroa buildup. The treatment costs $1.50-$3.00 per hive per year for materials.

* Other controls are being evaluated, such as the atomizing of Amitraz inside the hive. This is used in Italy but the risk of contaminating the hive or affecting bees is higher than with fluvalinate.

* Chemical control is only a short-term solution.

* No decision has been made to kill colonies infested with the mite. Hive movements were controlled until surveys were done to confirm the extent of varroa. Over-reaction to the appearance of the tracheal mite (acarine) a few years ago has made beekeepers (and government officials) wary of eradication programmes.

* Varroa really is serious. It feeds on the haemolymph ("blood") of the insect, and may have toxic saliva. It may spread viral diseases such as acute bee paralysis. Bees infested while still in the cell may be killed, or emerge severely deformed. Workers infested within 10 days of emergence have a life span half that of other bees. Parasitized drones have reduced numbers of sperm and less flight activity.

* As one beekeeper said: "tracheal mite is like getting the flu, varroa is like getting the AIDS virus".

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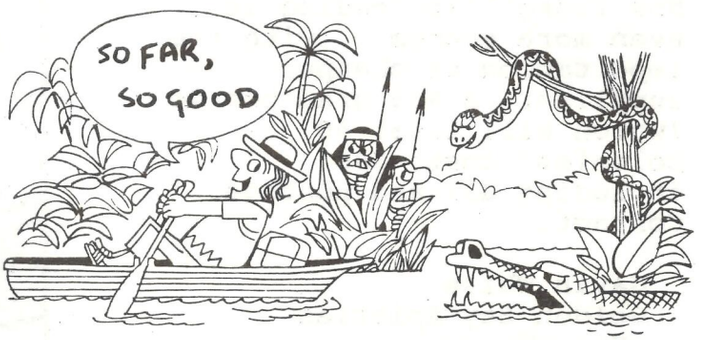


TRADE TABLE

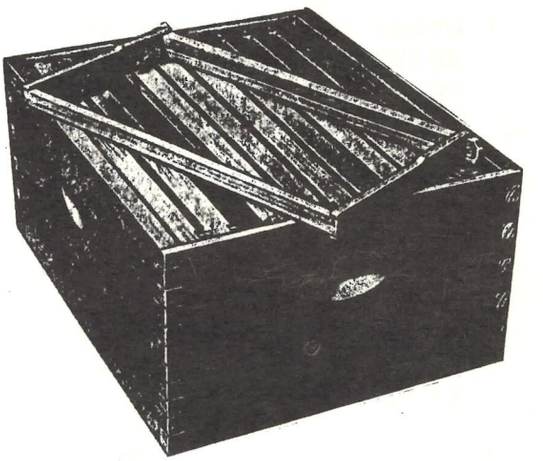
* Pure methyl bromide is available in one pound (they're imported) single-shot canisters for $5.60 plus GST from:

  Pest Free Services BOP Ltd
  PO Box 4106
  Mount Maunganui South

  Contact Mark Greenwood at (075) 89 793.

  The company is looking at the feasibility of filling 30 kg cylinders, which users can own. They may also be opening in branch in Napier.

  As always, be sure to specify 100% methyl bromide, without chloropicrin added.



* Olifin Products in Hamilton stock a full range of beekeeping supplies, including Ceracell Products items, Mahurangi Hiveware products, and bee suits from Bee Accessories. They will provide a very prompt and efficient service. Contact:

  Olifin Products
  PO Box 10-217
  Te Rapa
  Hamilton

  Norman & Ngaire Finlay
  Phone (071) 79 739

* Fumidil-B

  Now fumagillin feeding is even more economic, with the importation of cheaper supplies. A 9.5 gram bottle (which will treat 50 colonies) costs $85 including GST and postage. Contact:

  Gavin White
  Golden Bay Apiaries
  RD1
  Takaka
  Phone (0524) 58 088

Cheque with order. Price may fluctuate in future with currency movements.

* Paraffin wax dipper for sale, also Olifin plastic bee feeders. Contact:

  Steve Hammond
  Foxhill
  RD1 Wakefield
  Nelson Phone (054) 28 288

* Mahurangi Hiveware is available from Hughes and Cossar at Maleme Street in Greerton. You can get a price list from the owners: Ken & Lynne Perkinson, Pukapuka Road, RD3, Warkworth. Phone (084620) 890.

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MELITTIPHIS MORE COMMON THAN FIRST THOUGHT

The mite *Melittiphis* has caused a bit of consternation in the queen trade. It's found on New Zealand queens, and has turned up on them in Canada.

The word "mite" sends most beekeeping authorities into a flat spin, but this little beastie isn't regarded as a pest. No-one knows for sure what *Melittiphis* does in the hives, but it probably feeds on other mites or insects.

Earlier this year *Melittiphis* was discovered in the USA, and it had already been recorded from Europe and the UK.

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THAT FLOATING KIWI

The strong New Zealand dollar - how strong really is it? Reserve Bank figures show that it has moved up only marginally against the combined currencies of our five largest trading partners.

The key to measuring the movement of our dollar is the Reserve Bank's trade-weighted foreign exchange index. It's a weighted average of the dollar's movement against the currencies of our five largest trading partners - Australia, Japan, the UK, the USA and West Germany.

At the end of March 1985, the month in which the New Zealand currency was floated, the index was 61.3. It's been up to 7.12, but at the beginning of 1988 was 66.6. By the beginning of May 1988 it was virtually the same at 66.8. That's an increase of 8.97% in over three years since the float, but it's still lower than it was prior to the 1984 devaluation. The impression that the kiwi dollar is shooting skyward stems from looking only at its relative value against the US dollar, a currency which has weakened markedly in the world market.

Concentration on the United States currency also obscures the fact that the US is far from being our largest trading partner. Only about 15% of our exports go to North America (the US and Canada combined), which relegates the region to third place for New Zealand exports. New Zealand's largest trading partner is Japan, and of course our currency has fallen markedly against the yen.

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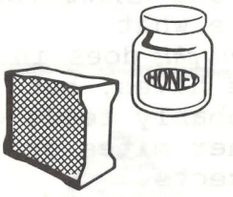
HONEY BEE PATHOLOGIST



New Zealand beekeeping has been fortunate over the past three years to have had the services of Dr Denis Anderson, a honey bee pathologist based at DSIR in Auckland. This position has been supported financially by the beekeeping industry trust funds.

Denis has just produced a paper reviewing his work, and I'll summarize parts of it here.

National survey of pests and diseases

A number of beekeepers have taken part in this large survey. They collected brood and adult samples quarterly during 1985-86, and annually since then.

At the moment Denis and his technician, Helen Murray, are still wading through a freezer full of samples, but they hope to have a

comprehensive, illustrated report available at the Auckland NBA conference in July. Some interesting results so far are:

* Nosema disease is the commonest, most widespread and serious disease of adult bees found in New Zealand. Spore counts are high, especially in spring.

* Chronic bee paralysis and amoeba disease are also common.

* AFB is the most serious brood disease. It occurred often in samples sent in by survey participants, so perhaps many beekeepers can't recognize it.

* Chalkbrood is the most common serious disease. We still don't know why it is common now but was either absent or present only in low levels a few years ago.

* Sacbrood is common, but its spring peak is lower than the spring occurrence in Australia.

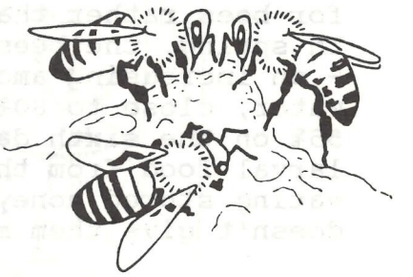
* Other organisms present are black queen cell virus, bee virus X, cloudy wing virus and Kashmir bee virus.

* Four species of mites are found in New Zealand, but these are not common and are not regarded as serious.

* Half-moon disorder was present in 10% of survey colonies.

* The bacterium *Melissococcus pluton* (EFB), the internal tracheal mite and the external mites *Varroa* and *Tropilaelaps* have not been found in New Zealand.

Half-moon disorder



Denis is continuing to look into HMD, and will be publishing a paper on his findings in July. HMD is common in spring swarms, overwintered nucs and in weak or light overwintered colonies. It has a main peak in spring and a minor one in autumn.

Effects of sacbrood and nosema on pollen collection

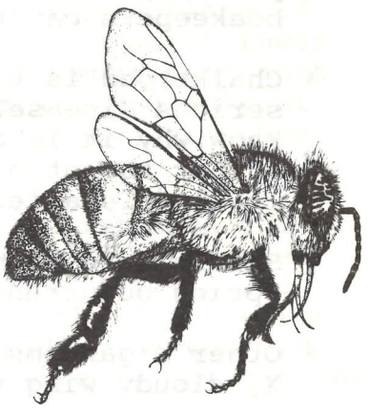
A study was carried out to see if sacbrood or nosema diseases affect the efficiency of pollen collecting by honey bees. (This has implications for pollination efficiency). The data has yet to be analyzed, but preliminary indications are that both sacbrood virus and *Nosema apis* infections do reduce pollen collection.

WATER, WATER EVERYWHERE

Providing water for bees is a subject that's often mentioned in overseas beekeeping books. How much do we need to worry about it in New Zealand? I've always assumed that most places in New Zealand have enough water around, especially in spring when demand is high because of peak brood rearing.

In his "Newsletter on Beekeeping", Dr Elbert Jaycox of New Mexico makes some interesting comments about watering for bees.

"If you have a dog or cat, it is a safe bet that the animal has a water dish within your home or close to it. If you enjoy wild birds, what is the first thing you do to see more of them? You put out a bird waterer or bird bath. With livestock, you make sure that good water is always available within a reasonably distance. But with bees, we usually put them out in the city or the country without a permanent source of water, often without a second thought about where they can get the water they need.



Bees need water in a temperate climate from when brood rearing starts right through until the bees are clustered within their hive for winter. I was going to say that readily-available water is less important during a nectar flow, but we are learning that this is not always the case, at least during hot weather in dry climates.

Let's look at the reasons that beekeepers should provide water for bees rather than forcing them to find it wherever they can. In spring, the bees in normal, strong colonies are rearing brood - an increasing amount every week. Brood food is primarily water, close to 80% on the first day of larval growth and about 55% on the sixth day. No problem, you say, the bees produce larval food from the glands in their bodies. But the bees are eating stored honey with a moisture content of only 15-20%, which doesn't give them much to draw on for larval food.

There is water produced from the bees' metabolism, and some of it may condense within the hive. But as soon as the bees can fly, they are out collecting water to dilute stored honey and to provide moisture in food for larvae and the queen. Without sufficient water, colonies do not develop.

Long ago, Dr Eva Crane reported that small colonies given only water developed more rapidly than those given syrup or those not receiving either water or syrup. She lists the failure to provide water as one of three serious management errors, and

relates the lack of water to inadequate brood rearing and colony development. This is not surprising because without 90-95% relative humidity in the cells, eggs will not hatch.

In warm weather bees need water also for cooling the hive. Studies have shown that in-field water increased bee visits to lucerne flowers and, subsequently, the close source of water freed extra bees for nectar collecting, so not as many bees were required to search for and collect water.

Scientists have recorded an increase in honey production from colonies with in-hive waterers. Such results are to be expected when you consider that the bees of one colony collected at least two litres of water in 24 hours in experiments at Tucson, Arizona.

There are other important reasons for providing water to bees, especially in horticultural areas. With a nearby source of clean water, bees are less liable to collect dirty and contaminated water. They have been known to collect arsenic and insecticides in the only water available to them. Colonies provided with nearby or in-hive water have survived better with more brood and honey production during intensive insecticide applications around them.

Water you provide can reduce nuisance problems when bees visit swimming pools, bird baths, wet laundry, and even newly-born animals to obtain moisture."

There are a few pointers for providing bees with water.

* Put it as close as possible to the apiary; preferably within 100 m.

* Making bees collect from an open source of water will cause a lot of drownings - it's best to provide a damp surface for the bees to walk on and draw up water from.

* A natural supply like a stream or ditch is ideal. Water can be a reservoir for bee diseases, which is why moving fresh water is better than a static source.

MILLIONS and MILLIONS of bees

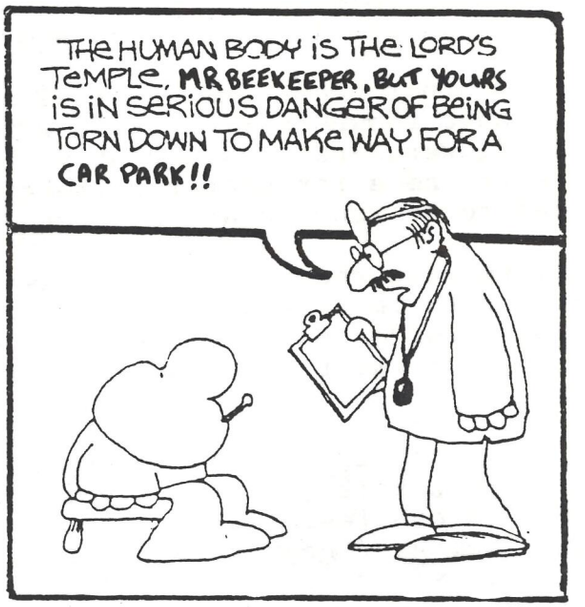
* If you need to supply water, remember that it must be clean, available continuously, and in a place bees can collect from without risk. Floatation material can be wood chips, bark, polystyrene, gauze, or water weed. Drums should be covered with netting to keep out animals.

Acknowledgement. The first part of this article was adapted from one by Elbert Jaycox, in his *Newsletter on Beekeeping*.

VITAMINS FOR BEES

In *Beelines* number 33 I wrote about vitamins for bees - some US research indicated that pollen with a high vitamin C content stimulated more brood rearing than pollen with a lower concentration.

One beekeeper I know has been investigating the role of vitamins and trace elements in the bee's diet. Reg Clarke at Blenheim would like to contact others who are interested in repeating some trials, especially in queen raising. If you'd like to follow this up, contact Reg at Sunflora Apiaries, 81 Lakings Road, Blenheim, or phone (057) 89 803.



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CHALKBROOD

At risk of hammering the point too hard, some more thoughts on chalkbrood control. Again, my thanks to Elbert Jaycox and his *Newsletter on Beekeeping*.

"For several years I have been collecting ideas and information which show that old, black combs are detrimental to colonies of bees. I felt that North American beekeepers should be more concerned about replacing them rather than bragging about how good they are after 30 or 40 years of use. The first report relating chalkbrood to old comb was that of Nelson and Gochnauer in 1982. They found less chalkbrood infection in new than old combs, and suggested that more use of foundation might help control the disease. Old combs may actually stimulate the growth of the chalkbrood fungus, according to Nelson and Gochnauer.

A new study of chalkbrood disease in relation to comb age was reported in 1984 by Koenig, Boush and Erickson. The study compared the incidence of chalkbrood infection among groups of ten package colonies established on each of several different types of comb: 1) New comb from foundation, 2) Super comb never used for brood, 3) Brood comb 5 to 30 years old, 4) Brood comb 30 to 45 years old.

All colonies were treated the same and regularly monitored for chalkbrood disease inside and out. Levels of disease ranged from negligible to over 6 percent, with the lowest infection in colonies on new combs and super combs, and highest in the old brood combs. There was good evidence that old brood comb contributes to the development of chalkbrood, perhaps by serving as a reservoir for the causal fungus, or even stimulating fungal growth as suggested earlier by Nelson and Gochnauer.

If my bees suffered seriously from chalkbrood this year, I would surely plan to do something about it for next spring. The best treatment, in the absence of any approved medication, would be to pull 3 to 5 of the oldest combs and have the wax made into additional foundation. If you are unable to change large numbers of colonies, do half the colonies in an apiary and plan to monitor chalkbrood infection and to replace more old combs the following season. Keep an eye also on other differences between the two groups of colonies - you may see better wintering, stronger colonies with newer combs."

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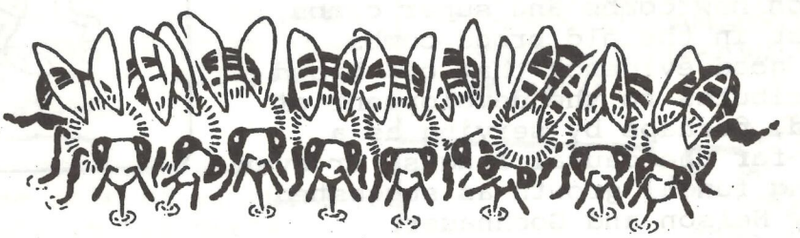
BEESWAX COLD CREAM

Here are three recipes you might like to try:

INGREDIENTS	PARTS		
beeswax	5	8	16
paraffin (57°C melting point)	10	10	5
white petrolatum (43-48°C)	10	-	-
mineral oil	54	56	48
glycerine	2	-	-
borax	1	0.6	1
water (perfume)	18	25.4	30

Method: Melt together the first four ingredients (if applicable) in a water bath and bring to 70°C. In a separate container, dissolve the last three ingredients and bring to 72°C. Add this to the wax mix and stir rapidly at first, then more slowly until cooled to 60°C. Add perfume when mixture has cooled to 55°C, then pass through a colloid mill or homogenizer. If this is not available, continue to stir slowly (to prevent aeration) until temperature is around 42°C, then pour into jars just before the cream has solidified. If poured at 45°C or below, the cream will have a good gloss and leave no surface depressions.

These are all-purpose creams. More beeswax will give a more solid product and the constant stirring will produce a fluffier cream. The first recipe can be made with lanolin instead of petrolatum. Use light beeswax for a nice product.



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This might be the last issue of *Beelines*. Currently under discussion is a proposal to greatly improve communication for beekeepers, by the NBA producing a monthly newsletter. Things are changing in your industry so fast that a frequent, national newsletter is important.

A newsletter like that would do away with the need for *Beelines* to carry much of its day to day news. But what about the technical and research review articles it features? If I stopped producing *Beelines* then I would like to continue writing technical articles, which could be included in the *New Zealand Beekeeper*.

All these ideas are in the melting pot at the moment, so I won't send out subscription notices with this issue. We'll wait and see what develops, but remember that MAF will still be concerned to see that information of beekeepers are met.

Writing *Beelines* over the last nine years has been one of the most rewarding parts of the job. I'm grateful for the good feedback I've had from readers, who have even been polite enough to laugh at the jokes.

Andrew Matheson

Andrew Matheson.

"So how can you tell when your bees are going to swarm?"

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This index covers *Beelines* 32-35 (from August 1987 to May 1988 inclusive).

"It's funny how people die in alphabetical order"

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