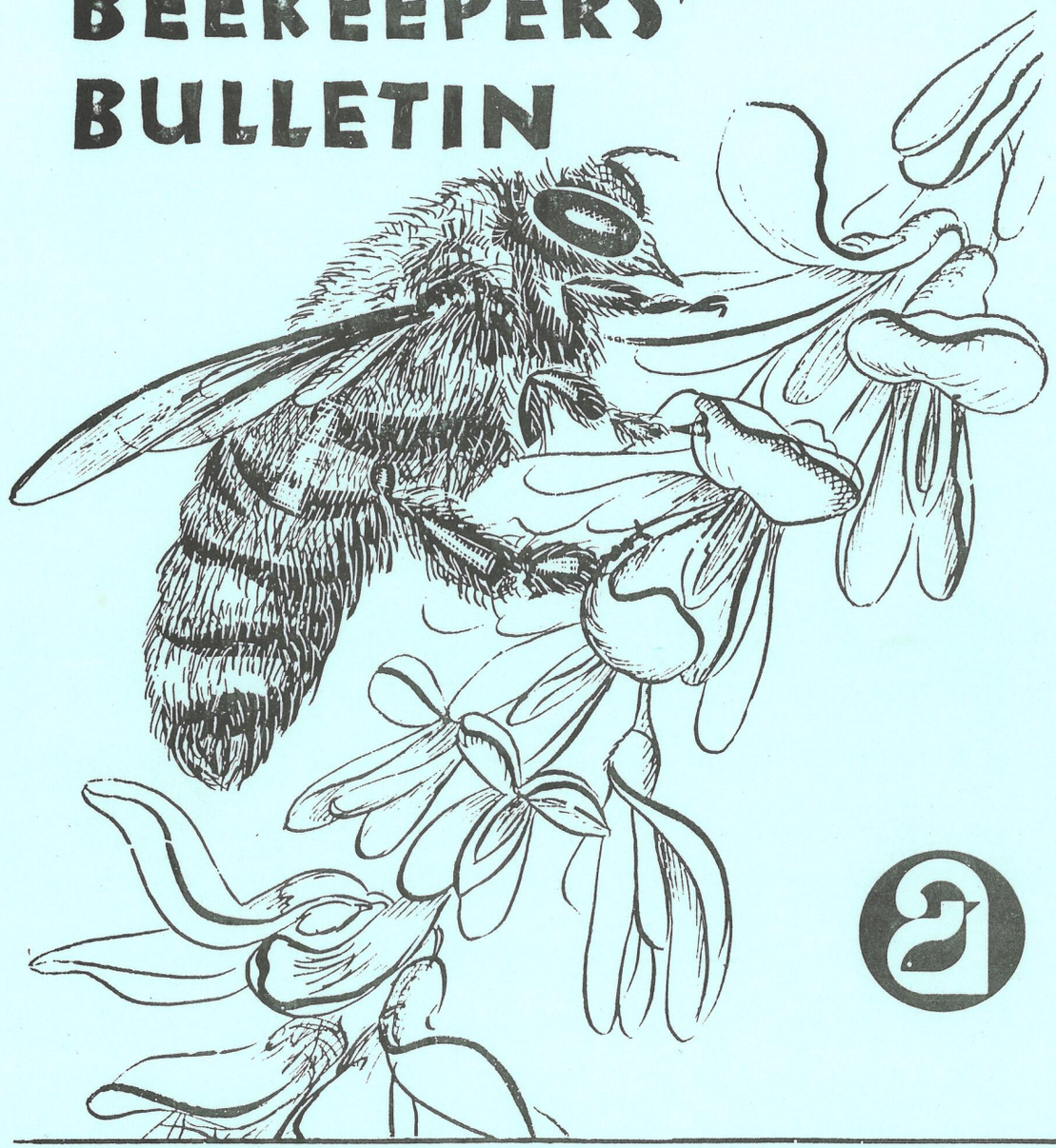
THE BEEKEEPERS' BULLETIN



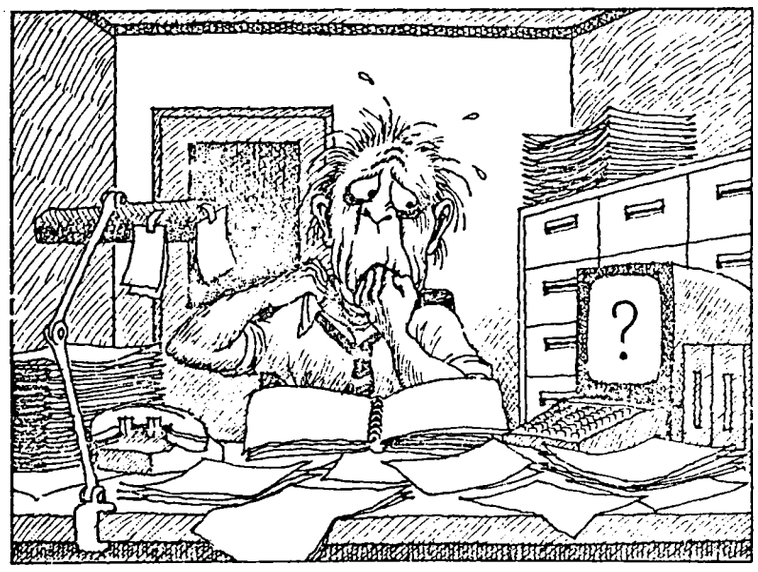
A.G. Matheson
Apicultural Advisory Officer
Ministry of Agriculture and Fisheries
Private Bag
NELSON

Telephone: 81 069 (Work)

Volume 5 number 4
May 1984

This season is a typical one, in that it has been completely unpredictable! It just goes to show that no one, even the most experienced beekeeper, has ever kept bees in the exact conditions that will prevail in the next season. We can never stop learning about bees and beekeeping.

The Micawberish optimism expressed in my last newsletter for Nelson and Marlborough beekeepers, that some honey could still turn up, was unfounded. Beekeepers there are living mainly off oily rags and pollination fees this year.



On the Coast, though, things are very different. It was a pleasant experience to be down there late in February and mix with the happiest group of beekeepers I've met for ages. And it was even better to go there a fortnight later and see the smiles growing bigger as the honey kept pouring in.

In March we were privileged to have Dr & Mrs Shimanuki visit the district, and I'm sure those at the meetings learned a lot about diseases and nutrition in particular. I would like to thank those branch committees and individuals who organised meetings and showed typical New Zealand hospitality to the Shimanukis.

Two samples of abnormal brood from Marlborough shown to me have recently been confirmed as chalkbrood. I personally don't believe this to be very serious, provided beekeepers take active precautions to minimise the disease's effects. Ways of doing this are included in an Aglink which will be sent to every registered beekeeper in New Zealand with

hive inspection statements this spring. This edition of the Beekeepers' Bulletin contains an article on breeding for resistance to chalkbrood.

Also in this issue: nosema disease, protein diets for bees, hive branders, the impending crisis in the honey industry, an index for volume 5, and much more. Read on!

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VENTILATION REVISITED

The article on ventilation in the last issue provoked quite a bit of discussion among beekeepers. It was actually written well before chalkbrood came along, but the advent of that disease makes the provision of ventilation doubly important.

Beekeepers on the West Coast have been forced to devise all sorts of hive ventilation systems, and one beekeeper there, who is really pushing back the frontiers of sub-aquatic beekeeping, kindly gave me these ideas.

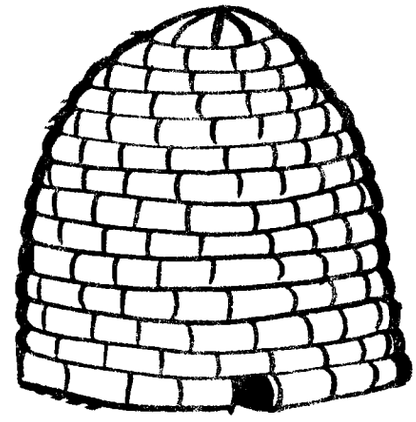
Starting with the inner cover, drill several large (c25 mm) holes roughly in the centre. (This enables them to be used for feeding dry sugar as well, especially if the upper rim is 40-50 mm high instead of the normal 10 mm, but that's another story.)

If you use bought lids on which the pieces of sarking are joined with a half-lap, trim these lapped portions off. As the timber shrinks it will leave gaps between the pieces of sarking.

When nailing the riser inside the lid, bring it back from the edge by 5 mm or so. This will enable some air (and water) movement through the gaps between the pieces of sarking, over the riser, and down between the overhanging lid and the sides of the top box. If the lid is snug-fitting enough to prevent robbing, as bought lids should be, you can even leave the riser off the ends and put it only on the sides. This will allow plenty of air movement out under the lid.

With old lids that are ill-fitting, leave all the risers on but keep them 5 mm away from the sides of the lid. This will allow air movement but prevent access by robbers.

Another technique to help wintering is to provide a top entrance. One way of doing this is to put a division board on top of the second brood box, with a notch cut out for an entrance on the lower side. Leave a top (or Miller) feeder on top of this with the hive lid sitting over the feeder. The bottom entrance is reduced with a mouse guard as usual.



Moist air will either move out the top entrance or up through the holes drilled in the division board (remember?) and be absorbed by the floatation material in the feeder. With the top entrance the bees get quite a bit more flying time in winter, which is important for minimising nosema disease incidence.

You have probably all heard the old adage "Bees do not freeze to death in winter - they starve". It's hard for us as warm-blooded animals to understand the honey bee's totally different method of thermoregulation, but they heat themselves, not their surroundings. A startling experiment in Wisconsin, one of the colder areas of the USA, deomonstrated this.

For two seasons, eight colonies of similar strength and the same stock were selected in October (autumn). Half were hived in conventional wooden hives with 25 mm holes as top entrances. The other half were installed in hives in which the boxes were cut away on each side to leave a large window, which was covered with wire mesh. Temperature probes were placed between the middle frames of each hive body.

From October through to January, temperatures were the same inside the clusters in both conventional and open hives. Even when it was around -20°C or lower, brood-rearing temperatures (33°C) were recorded within the clusters in all colonies. Those in the ventilated boxes only suffered in February, when strong winds of up to 50 km/hr physically blew the bees off the clusters and destroyed the colonies' ability to regulate temperature.

I'm not suggesting that you should build see-through hives, but this experiment does make the point that bees do not need to heat their surroundings in order to keep warm. You can devise the best hive ventilation system for your own particular situation. The general rule is to provide as much through ventilation as is practicable, without making the hive vulnerable to robbing.

Moeller, F.E. 1977. Overwintering of honey bee colonies. United States Department of Agriculture, Production Research Report no 169, 15 pp.

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MORE ON SUGAR FEEDING

In the last issue I wrote a piece on getting the best results from sugar feeding, in which I said that the most efficient way of getting sugar stored in the hive was to feed a concentrated solution (62% sugar). The work of Ribbands from Rothamsted showed that bees fed concentrated syrup stored up to one-third more stores than those fed dilute syrup (38% sugar).

Several people queried this, remembering an article by Murray Reid from ten years ago which suggested that bees diluted any syrup stronger than 50% sugar before they took it up. Isn't feeding a concentrated sugar actually inefficient, as it forces the bees to waste all this time collecting water?

The two results aren't contradictory. Yes bees do dilute a 62% syrup, but the work from Rothamsted shows that bees still store more honey from it.

Let the bees work out their own efficiences. What is more important to you as a businessman is the expense of carrying water all around the countryside. If you feed out 10 tonnes of sugar as a 50% syrup, you have the petrol and labour costs of carrying 4.5 tonnes MORE water from apiary to apiary and dispensing it into hives, than if you fed the same 10 tonnes of sugar as a 62% solution.

Yes, if you feed concentrated syrup the bees have to gather water, but I don't believe this has any effect on production. The bees lick much of this water from inside the hive, and probably find most of the rest close to the hive.

Reid, G.M. 1974. The inside story of feeding sugar to bees. New Zealand Beekeeper 36 (2): 41-43.

BRANDING HIVES

The "Rodney and Waitemata Times" for 15/3/84 reports what the police described as "the first successful prosecution following a beehive theft in New Zealand".

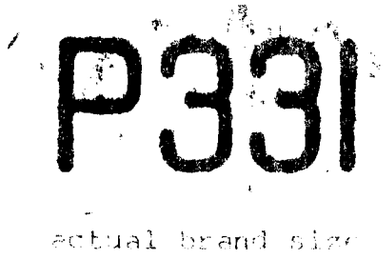
Seems a poor chap's own hives didn't come up to strength in time for his kiwifruit pollination contracts, so he "borrowed" several other beekeepers'. A total of 63 hives was involved, and apart from doing 200 hours community service the offender had to pay $6090 restitution to the 3 beekeepers concerned. That covered the value of the hives and bees stolen, but not the honey production and kiwifruit contracts lost by the rightful owners.

Hive branding is an obvious way to reduce the attractiveness of your hives to a potential thief, and to aid recovery if they are stolen. Branders have been mentioned before in this newletter, but here's a review of the several types available.

New Zealand

- Jesson Burn Brander

  L W Jesson Ltd
  P O Box 6051
  149 Springs Road
  Hornby
  Christchurch



actual brand size

Described in detail in the Beekeepers' Bulletin vol. 2 no. 2 (November 1980). It is the only New Zealand-made brander in this list, and the only one that is easily available in this country.

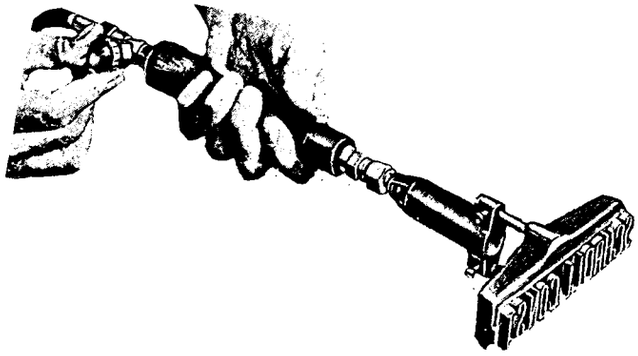
The complete unit contains a stainless steel head ($82.28), hose and handle ($31.84), handpiece with regulator valve ($36.13), and either an LPG or air-acetylene jet ($9.75 or $12.50).

From photos included with the information brochure it would appear that the price of hose and handle ($31.84) could be saved by using small (1.2 litre) Primus or Rockgas bottles. This would make the unit more portable as well.

United States

- Everhot Gas Brand

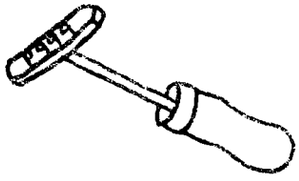
Everhot
P O Box 38
Maywood
Illinois 60153
USA



This manufacturer of brands advertises in most US bee supply catalogues. They make both an LPG and an electric (120V) iron at $NZ 127 and $126 respectively. One desirable feature of these irons is that the brand heads have removable letters and numbers, and come in various sizes. Additional letters and numbers are $NZ 2.75 each. Even with import duties these irons might be worth considering if several beekeepers want to purchase a brand together.

- Miller Flame Brand

I Miller Enterprises
P O Box 29913-B
St Louis
Missouri 63129
USA



An economy brand which must be heated with a gas torch or in a fire or hot coals before use. At $NZ 27, however, it is still worth considering for hobbyists or part-timers wishing to protect their equipment against theft. Letters and numbers (up to 5) are not removable.

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PROTEIN DIETS FOR BEES

When Dr Shimanuki visited the region in March he generated a lot of interest in protein supplements for bees, especially lactalbumin. I thought I had reviewed this food in the Beekeepers' Bulletin before, but apart from a brief mention when it first came out (see vol 4, no. 1, August 1982), it seems I haven't.

So, let's look at the whole range of protein sources available for feeding to bees. A number of sources have been tried over the years, with varying degrees of success. Leaving aside exotica such as chicken meat (used in Ireland in 1922), and asses' milk (recommended by Langstroth in 1879), we have the following range:

Protein source	Moisture %	Protein %	Fat %	Ash %
Soyabean flour	11.0	42.0	3.5	6.5
Brewer's yeast	7.0	45.0	0.4	6.5
Torula yeast	6.8	48.5	2.0	8.0
Wheast®	7.0	58.5	1.0	10.0
Skim milk powder	8.4	33.0	0.5	8.0
Lactalbumin	4.4	87.4	3.5	2.0
Herring meal	7.7	71.6	5.0	2.7
Pollen	11.2	23.0	5.0	2.7

Soyabean flour (SBF)

Probably the protein source most widely used by beekeepers in New Zealand and easily the most obtainable. In the past, information on the use of SBF in bee feed specified that the flour purchased must be expeller-processed. To produce this, beans were pressed hydraulically to extract the oil, leaving a fat level of 4-6%.

In the past few years, however, a new process has been introduced which involves washing the beans with an organic solvent to extract the oil, and then toasting the meal to destroy elements which might interfere with proper digestion. This process is now used exclusively for the production of SBF in the US (where all of this product comes from), and expeller-processed flour is no longer available. Flour from this new oil-extraction process has been tested and found acceptable to bees.

Palatability can be a problem with SBF so it is recommended that at least some pollen is used rather than SBF on its own.

The most commonly used SBFs are:

- for making supplements (i.e. with natural pollen in); Staley F-200 defatted soyaflour. Obtainable from:

  A M Satterthwaite & Co Ltd
  203 Hereford St
  Christchurch Ph 796 130

  price: $1.50-1.70/kg, depending on quantity ordered.

- for making substitutes (i.e. with no added pollen); Archer Daniels Toasted Nutrisoy T-6. Obtainable from:

T J Edmonds Ltd
P O Box 472
Christchurch Ph 893 189

price: $2.05/kg

Brewer's yeast

A product used widely in North America, and which works well because the bees find it very palatable. Brewer's yeast (or Saccharomyces cerevisiae) is available from:

Mauri DYC Foods
CPO Box 10
Auckland 1 Ph 764 049

Cost (in 1980) for unsalted roller-dried yeast was $20.80 per 10 kg bag, freight free into store on a minimum of 10 bags.

Torula yeast

Another yeast which is used overseas for bee feed, but is not produced in New Zealand. Torula yeast is similar in protein content to brewer's yeast (45-50% by weight).

Wheast ®

A product of the fermentation of cottage cheese whey by a special yeast, Wheast was for years one of the best of protein sources for bees. Not only was it palatable, but in tests on brood production it came a close second to straight pollen. Unfortunately production of Wheast in the US ceased several years ago and it is no longer available.

It was this unavailability of Wheast that led USDA researchers to experiment with a mixture with similar properties: whey/yeast, or lactalbumin/yeast as we know it. More about that in a moment.

Skim milk powder

Although widely used as a component of pollen substitute formulations, skim milk powder has given some adverse results which have been attributed to the high toxicity to honey bees of lactose and galactose, which together make up 50% of the powder. Skim milk powder is thus not recommended as a protein source for bees.

Herring meal

Fish meal made from Pacific herring caused quite a stir several years ago when an article in Bee World extolled its virtues as a pollen supplement. Subsequent research conducted in British Columbia showed that while it was a high grade protein source which would be processed by bees, several things made its widespread use as a bee feed very much in doubt.

To begin with, commercially available herring meal is too coarse for bees and must first be powdered with a hammer mill. Limited trials here with Talley's fish meal indicate the same problem. Second, because the material is easily spoiled, herring meal must be refrigerated to remain suitable. Third, patties made with the material were highly elastic and sticky, and many beekeepers found them difficult to make and use. The researcher, Dr Bill Chalmers, has concluded that at this point "it is premature to advocate the widespread use of fish meals in commercial apiculture".

Lactalbumin

This is a milk protein product which has shown considerable promise in American trials. It has a high protein content (nearly 4x that of pollen) and comes in two forms: ring-dried and spray-dried. The ring-dried (from Golden Bay or Tirau dairy factories) is too coarse, and the spray-dried (from Reporoa, near Rotorua) must be used.

The magic mixture ("Beltsville Bee Diet") is

12.5 kg	lactalbumin	($\frac{1}{2}$ x 25 kg bag)
25	kg brewers yeast	($2\frac{1}{2}$ x 10 kg bags)
70	kg sugar	(2 x 35 kg bags)

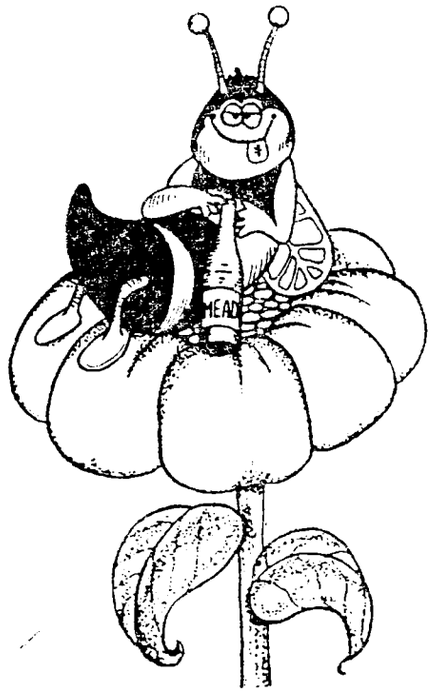
mixed with water to a consistency that will make firm patties. I don't have details of the amount of water needed, so take care when making it up. It's rather like mixing concrete - go too heavily on the water and you'll need a tonne of dry ingredients to get back to the right consistency.

Points to remember

* Use some natural pollen in the mixture if you can, to make it more attractive to the bees. In this case, though, remember that pollen softens readily in water but not in sugar syrup. Add the pollen to the water before dissolving the sugar.

* Always mix the dry matter into the syrup to avoid lumps.

* It's very important to obtain the right consistency - not so hard that the patty cracks, but also not too runny. Keep adding dry mixture until you can make a good firm cake, but make sure to keep both liquid and dry mix in reserve to make adjustments.



* Before making into patties leave the mixture overnight. The soyabean flour may absorb much of the moisture and require additional syrup to obtain the proper consistency.

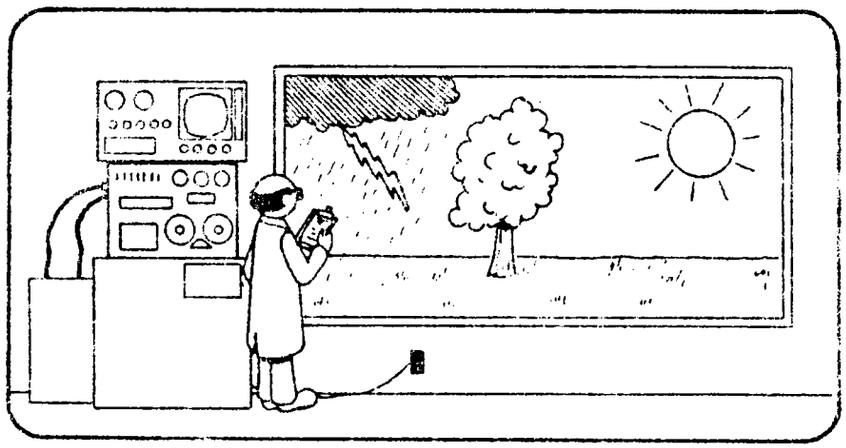
* For each colony place approximately 0.5 kg of the material on a piece of wax paper. Fold the paper over and press the material into a thin (12 mm) patty. The paper will keep the patty from dehydrating.

* Place the patty on the top bars of the top brood chamber directly over the brood nest. If natural pollen is available the hive will not use the supplement. However, in periods of dearth the material will be readily taken up.

* Patties can be frozen and kept until use, provided they are covered with wax paper.

Acknowledgement: parts of this article came from Cliff van Eaton's Southland district newsletter.

Disclaimer: mention of any proprietary product does not imply endorsement by MAF or recommendation over similar products not mentioned.



"There now, a ½ inch rain over here, some sunshine over here and a dash of fertilizer there — that should do it! Honeyflow here I come!"

References:

Herbert, E.W. 1979. Brood rearing by small caged honey bee colonies fed whey-yeast pollen substitutes. Journal of Apicultural Research 18 (1): 43-46.

Herbert, E.W.; Shimanuki, H. 1980. An evaluation of seven potential pollen substitutes for honey bees. American Bee Journal 120 (5): 349-350.

Herbert, E.W.; Shimanuki, H. 1981. Cholesterol and salt requirements for brood rearing by honey bees fed a pollen substitute. American Bee Journal 121 (8): 572-574.

(Note that the first two references refer to lactalbumin as "whey". Shades of Little Miss Muppet, eating her curds and lactalbumin.)

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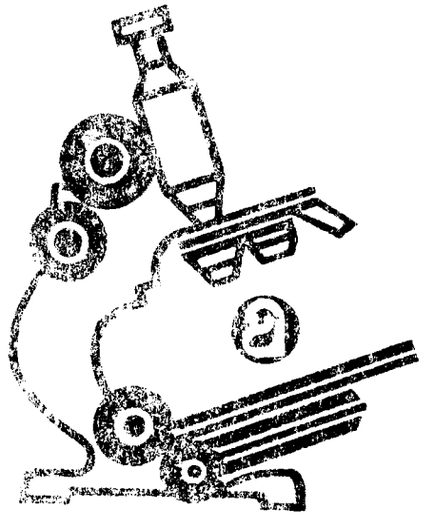
MARKING CRAYONS

In the last issue I asked you for some feedback on what to use for marking hive lids. Ian Berry saved me from being deafened with silence, by writing to me and enclosing a crayon that Arataki use. It is the "Moa" brand, waterproof, non-toxic marking crayon (black), made by Smith Biolab Ltd, Auckland.

Ian says that Arataki have used it for many years, and it is legible for several seasons. It certainly is easy to use on lids.

PESTICIDE ANALYSIS

Bee samples collected for pesticide analysis go to MAF's research centre at Wallaceville, in Upper Hutt. While I was there recently I asked staff how much it cost to do each analysis.



Not being a commercial lab they don't really think in such terms, but they did have this to say. A sample takes virtually all day (8 hours) to do, though the person carrying out the work can do other things in between certain operations. (If they get two, or half a dozen, samples on the same day it doesn't really take any longer, as only the same jobs need doing).

A local scientific lab has a charge-out rate of $35.50/hr. If you assume the pesticide analysis at Wallaceville only takes part of the 8 hour day, you're still looking at $150 and upwards. The comment of a private lab was that it would cost c$1000 to set up the technique, and probably at least a couple of hundred dollars per sample after that.

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AN IMPORTANT MESSAGE ON HONEY MARKETING

"Our industry crisis today" is the title of a recent article in the American Bee Journal. The problems facing us in New Zealand are a bit different from those in the States but problems we have, and I think the passage contains some things that are important for us to think about.

The article's author is Steve Taber, who for many years was a bee scientist with the US Department of Agriculture. A while ago he resigned his position with them, and set up a beekeeping and queen rearing business at Vacaville, near San Francisco. He writes a very good series of articles in the ABJ called "Bee behaviour", and as you'll find out shortly, grows prunes as well as keeping bees.

I've extracted the main message of the article below, but can supply the complete text if anyone is interested. (I've mostly left pounds and US dollars alone. There are 2.2 lb in a kilogram, and a US dollar is worth about $NZ 1.50.)

"I talk to many beekeepers all over the United States and am disturbed that many of these people don't realize the trouble that we are in as an industry. Among these beekeepers, there is this seemingly great optimism that things will work out and be okay, but in the past they haven't and that's what this column is about.

"Our industry problem affects each and every one of you, whether you are just an amateur with one colony who subscribes to a bee journal, or a commercial bee person with a really big outfit that employs many people.

"The problem is two-fold:
1) Much (American) honey is being brought by the US Government to support the price of honey, at present almost 100 million pounds (45 000 tonnes or half of an average year's production), and
2) the importation by honey packers of large amounts of honey from foreign countries. The foreign honey is cheaper than domestic honey and thus is bought by honey packers. It is being placed in grocery stores all over America today.

"The current USDA administration is working toward easing tensions with China and to increase our agricultural exports to China (mainly grains and soyabeans). The Chinese government doesn't have a lot of US dollars or gold with which to buy wheat, corn, and soyabeans, and any industry that generates dollars or gold will certainly be encouraged by their government to flourish. So, I think that the supply of Chinese honey will grow tremendously in the next few years.

"Other major honey exporting countries, such as Australia and Canada, have honey production costs as we do and will really suffer, while countries such as Mexico that have a low labour bill and export a lot of honey won't be damaged as much.

"Beekeepers in the United States are in a peculiar spot since we used to export honey and are now importing vast quantities. But, the big thing is that one of these days Old Uncle Sam is going to say "100 million pounds is enough" and will buy no more honey. It will be much worse if the Government decides to get out of the market altogether and dumps the vast hoard of honey that they now own. It will require food stamps and welfare to keep us from starving to death.

"The Chinese aren't going to go away and we still want to have a bee industry. You as a beekeeper want to have good beekeeping associations. You want to have lots of bee equipment manufacturers because then you get to pick and choose for quality and price. You want good bee journals. So what's the point I am trying to make?

"For the past 15 or so years we have been on a major "up" in our industry. Do you remember when we had "hippies" and "natural food freaks" all over the place? And why didn't those young men cut their hair? Well, the change in attitudes affecting the quality of food, particularly honey, made a tremendous difference in the price of honey and it revitalized our whole industry. Let's call that event "Honey's Price Revolution".

"Prior to the price revolution of honey the wholesale price of white, refined sugar and the price of the highest quality white clover honey on the New York market for the previous 60 years was about 1 to 1.5. So, if the price of sugar was 10.5 cents, then the price of honey could be predicted at about 15 cents to 17 cents per pound.

"In October 1963 prices for white honey were 14.5 to 16.5¢/lb f.o.b. You talk about times being tough for beekeepers and bee associations, for manufacturers of bee equipment and for bee journals, then that was the time. When you went to a bee meeting, everyone was at least 50 years old and there were no new, young people getting into the bee business.

"Then the price revolution came along and pushed the wholesale price of honey to about twice the price of sugar. That, combined with beekeepers being paid for assisting growers with crops requiring pollination for the past dozen or so years, has been attracting more people into beekeeping than it has for many years. I think that's great. I also like the increased quality of bee meetings, bee journals, and bee equipment that is offered now versus 20 years ago. And I would like very much for it to continue well into the future.

(What's the price of sugar now? In 1983 it was 31.6¢/lb, while the price of honey then was 51-63¢/lb.)

"The price of honey is going to determine whether beekeeping will survive as an industry. For the few young people coming into beekeeping in the past 10 years or so, it will be necessary for the bee industry to make money from honey. I think the price of honey should be up to around 80 cents to a dollar a pound wholesale. Stop-gap emergency measures needed now such as price subsidies, import restrictions, and USDA purchases of honey should be considered. We have got to start industry-wide promotion and advertising in a big way now.

"When I came here to California four years ago, I bought a small farm of 15 acres with a 7 acre prune orchard. As an example of what we in the bee industry have to do, I want you to examine a few prune figures. In 1982 my orchard produced 9,758 pounds of dried prunes for which I received $0.3617/lb from the Del Monte Corporation. But now get this - in their statement to the prune growers and from statements from all the prune buyers, a deduction is made of $20 per ton, or $97.58 in my case, for an advertising assessment. I didn't ask, I wasn't told, and I didn't have any choice in the matter.

MANUFACTURERS - EXPORTERS & IMPORTERS

MEMBER OF CHAMBER OF COMMERCE & INDUSTRY, SIALKOT
BANKERS: MUSLIM COMMERCIAL BANK LTD. SIALKOT

SIALKOT-1. PAKISATN

Ref. No. SU/1807/83 *Dated* 6.8.83.

The Exporter Nov. '83.
(Hope beekeepers are doing better than this!!)

Dear Sir,

Hockey Sticks.

We owe debts to export promotion for you address as one the biggest buyer of Hockey stick from Pakistan.

We wish to inform you that we are manafacturer, and exporter of said item from city of exporters.

Wefully conversent with nook and coner of exporte of this item.OUr product is most poplur in the World, market our prices most comptitive C &F destianation port by sea. Your first trail order will convance you about. our workman ship and quialty of workmanxship product.

Please call us for commercial samples which will made aviable hearing from you .

our price as under in us $

Hockey stick Genine Mulbarry head fifted with muliann singipori canne splice joint covered with paint withICI and with towel grip. Each

Hockey Stick full size with Glass fabric top grade		$7.80
[Full] size 36"	ist	6.00
Hockey stick full size 2nd		$4.00
36" Commercial"		$3.50

Looking favourable news from your side.

Yours faithfully,

"The beekeeping industry leaders recently had a meeting and have come out with a recommendation for a honey subsidy from the government. That's a stop-gap measure that will work for a year or so, but that should be all. What we have to have for the long run is a honey promotion campaign that will be so effective we not only use up all our own honey, but we have to import honey from all over the world to fill the created demand. And this honey promotion has to be done by everybody, singularly and collectively.

"I was at a bee meeting recently with Tom Ross (Ross Rounds from Ohio for comb honey) and we were eating dinner in a nice restaurant when he asked the waitress, "Where's the honey?" He didn't ask politely for the honey; he DEMANDED it. We beekeepers are important and honey is good to eat, so why not tell the whole world that fact?

"Most of the readers of this bee journal column are amateur beekeepers who like to have lots of nice big equipment catalogues to look at and to order their bee supplies from. You like having the nice big bee meetings with out-of-state speakers and experts on bees to give their talks. You may not sell much honey or produce much honey, but this is as much your problem as it is the person who produces a million pounds of honey a year. Because if the money is not there, the bee supplies are not there and the bee meetings and experts are not there either.

"Come on, remember the prunes. There's a bumper sticker that reads "Start a movement; eat a prune." They paid me a wholesale price for the prunes of $0.36 per pound and assessed me about 2 per cent off the top for promotion and advertising. NOW COME ON, WHAT ARE WE BEEKEEPERS DOING?"

Taber, S. 1983. Our industry crisis today. American Bee Journal 123 (12): 846-847.

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The colour Aglink on brood diseases that I said would be sent out with the New Zealand Beekeeper wasn't, but it will be sent instead to all registered beekeepers with their annual inspection statements. It deals with AFB, sacbrood, and chalkbrood.

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NEW HONEY CENTRE OPENED

Beekeepers heading away on their end-of-season holiday soon would be well-advised to make a beeline for Queenstown. A new honey centre has been established in the Queenstown Mall by Rob & Ros Greig of Queenstown and Ken & Sally McNeill of Invercargill.

Together they have put together an entertaining and educational shop (complete with large observation hive), as well as one of the most attractive honey packs seen in the district for a long time. For once, specific source New Zealand honeys such as kamahi, rata, thyme, bugloss, and honeydew are being treated as the unique gourmet items they are, rather than being demoted to the lowly bakery grade.

QUEENSTOWN HONEY CENTRE

The Queenstown Honey Centre shouldn't be hard to find. It's next to a cocktail lounge called "Bumbles", and I'm told the waitresses' uniforms there alone are worth a trip!

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HONEY SHOP MATERIAL

And while on the subject of honey shops, if any of you sell honey at the door and want to jazz up your sales point a bit, then you might get in touch with a North Island company called Footprints Ltd.

This company either makes or handles silk-screened material, books, and nick-nacks with a beekeeping theme. Contact:

Mr Joseph Lane
16 Wheretia St
Taupo Phone Taupo 82 028

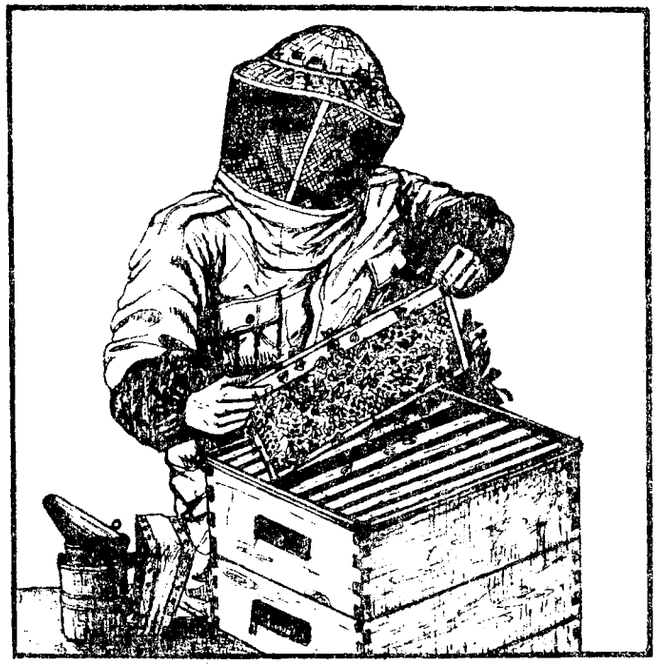
KNOW YOUR DISEASES - 1. NOSEMA DISEASE

One of the most widely discussed but least often recognised diseases of adult bees, nosema disease, costs the world's beekeeping industry millions of dollars in lost income every year. Through its debilitating effects on workers and queens, the pathogen Nosema apis Zander reduces the vigour of infected colonies, resulting in a decreased lifespan of workers and queens, a reduction in brood rearing, increased supersedure, and reduced honey crops.

Diagnosis

Although the disease is endemic in nearly all honey bee colonies, the infestation may be so light that there are no obvious symptoms. Where symptoms occur they may point to problems other than nosema disease, so microscopic examination of bees taken from suspect colonies is the ONLY SURE METHOD of confirming the absence or presence of Nosema apis.

Often the first sign of the disease that is apparent to the beekeeper is failure of colonies to prosper. Sometimes a colony may dwindle, losing bees more rapidly than they can be replaced. Under the stress of a severe infection, colonies may show the following symptoms: bees with disjointed wings and swollen abdomens crawling about in front of the colonies. Inability to fly and loss of the stinging reflex are also frequently associated with nosema disease.



An examination of the midgut may assist in the diagnosis. Holding the thorax of the (dead!) bee in the left hand, and gently pulling out the last abdominal segment with the right,will expose the hindgut, midgut, and honey sac. The normal midgut is straw brown in colour, and not enlarged. An expanded milky white midgut, in which the crossbands are nearly gone, points to the presence of Nosema apis.

A microscopic examination is the only certain method of diagnosis. Take bees from the hive entrances (i.e. older workers), or obviously sick bees from in front of the hive. In winter take bees from the tops of the clusters, where infected bees tend to congregate. Use 25 bees per sample, and place them in a small jar in some clear methylated spirits or absolute alcohol. (Gordon's gin is fine, though I would prefer this to be sent separately to save me having to strain the bees out.) To be effective the sample should be taken in autumn and any fumagillin fed then too. Bees need continuous access to the drug, which persists in the syrup or in honey made from the syrup. More about that later.

For those wishing to do your own testing, you will need a microscope with 400 x magnification (over $500?), a device called a haemocytometer (about $100 worth?), as well as a few microscope slides, etc. I can give details of the method if required.

Spore levels are interpreted as:

up to 1 million spores per bee	light infection
1-5 million per bee	medium
over 5 million per bee	heavy

Causative organism

Nosema apis Zander is a spore-forming protozoan that parasitizes the gut lining of adult honey bees, destroying the cells lining the gut in the process and condemning the infected bees to a fate of gradual starvation. The cycle starts when spores are swallowed by the bee and pass into the midgut. Here they "germinate", i.e. the content of the spores pass through "polar filaments" into gut lining cells to which they have become attached, and where they form the "vegetative" or reproductive stage of the organism.

The vegetative stages grow and multiply; in 6-10 days the host cell becomes filled with newly formed spores, which are released into the gut when the cell ruptures as part of the normal process of digestion. Because of the infection, however, the cell becomes ineffective in digestion, thus reducing the amount of nutrients available to the bee. A severely infected bee accumulates undigested food matter and

Nosema spores in the gut until, during extended confinement to the hive, it is forced to defaecate within the hive. As other worker bees clean up, they in turn swallow the spores, thus completing the cycle.

The length of time over which the spores may remain viable depends on the conditions to which they are exposed. While they remain capable of germination for months in a mass of dried faecal matter, spores lose viability in several days after being suspended in water or exposed to direct sunlight. They are also readily killed by heat and by suitable fumigants.

Disease transmission

Worker bees infected with Nosema apis undergo a premature reduction in the size of the fat body and of the brood food (hypopharyngeal) glands, and their life span is significantly shortened. The ability of a colony to rear brood and to produce a crop of honey is strongly influenced by the number of bees infected.

Toward the end of winter and the beginning of spring, when colonies may be confined for extended periods of time, some defaecation will occur within the hive, even in a normal colony. The faecal matter will be cleaned up by other bees, which in turn become infected. Thus the level of infection within the brood nest rises rapidly, and continues to do so as cleaning activities are extended to meet the demand for more brood comb area. A colony in which a very high level of infection is reached during the winter may dwindle so rapidly in strength that, due to the premature death of the old, overwintered bees, it is unable to survive.

The proportion of infected bees, after having reached its highest level in the late spring or early summer, quickly declines, because as soon as regular flights become possible the excreta are voided normally outside the hive. From this point on very little further transmission of spores from infected to healthy bees takes place, and by the end of the season nearly all of the infected bees have been replaced by healthy ones.

Unfortunately a sufficient number of spores will survive in the colony to infect a few bees of the cluster, and the cycle starts afresh. Combs soiled with spore-containing faecal matter, then, are the natural carriers of the pathogen from one season to another. Since the disease reaches a low level during the summer months, outside agencies such as contaminated water or sources of nectar do not seem to be important.

While the peak in the level of infection occurs at nearly the same time each season, the overall intensity varies. Wet, cool conditions during the active period retard colony development, and the combs are not as fully occupied or as thoroughly cleaned as they are during a good season. Consequently the colony reaches the end of the season with "dirtier" combs than usual, and a higher potential for infection in the beginning of the winter period. Over a period of years, this effect is apt to be cumulative.

Control

Several different types of controls are available to beekeepers; namely management, physical, and chemical techniques. It is true of many primary producers (such as orchardists or farmers), that they often tend to ignore sound, preventative management, and rely too heavily on chemicals to control pests. Beekeepers aren't quite so hooked into the chemical mentality, for obvious reasons, but with nosema there is a tendency to regard fumagillin as the miraculous cure-all, while ignoring other methods of control.

A) Management practices which lessen the effects of the disease are absolutely vital. Don't even think about a chemical (drug) control programme unless your management is up to scratch in every apiary.

   1. Young, vigorous queens and strong autumn populations of young bees.

   2. Good apiary sites, with air drainage, protection from prevailing winds, and a maximum of direct sunlight in winter.

   3. Adequate quantities of high quality honey and pollen stores.

   4. Routine replacement of old combs.

B) Fumigation of stored combs will destroy the "reservoir" of spores present. This may be worthwhile in high-risk areas such as queen-raising, where old combs could be fumigated and recycled.

   1. Acetic acid is a time-honoured way of killing the spores of Nosema apis in beekeeping equipment. The method used is as follows: A pad of absorbent material, soaked with 120 ml of 80% acetic acid, is placed onto the topbars of each infested hivebody.

If you can't buy 80% acetic acid, make it up by mixing one part of water to four parts of pure acetic acid (called glacial acetic acid). Stack the combs and leave them undisturbed for 1 week, after which they are aired thoroughly for at least 2 days at room temperature.

Acetic acid is extremely foul-smelling, and though harmless to honey and pollen it does corrode frame wire and nails. It also corrodes skin and eyes, so gloves, goggles,and a respirator must be worn when it is being used.

In 1981 costs worked out at 20¢ per super for materials only.

2. Ethylene oxide fumigation is effective in killing Nosema spores. The same concentration as used for wax moth control (9 300 ppm or 18 mg/litre) controls Nosema. The cost (1981) is about ½¢ per super plus labour.

Any fumigation of combs is only effective if it is followed up with a conscientious drug-feeding programme.

C) Thermal sterilization. Scientists have found that heat will destroy Nosema apis spores. Combs heated at 52°C for 3 hrs or 54°C for 2 hrs showed very little reinfestation.

This has little practical application, however, as these temperatures are very close to the melt down point for combs, and few beekeepers have hot rooms where the temperature is even throughout and can be controlled to within a degree or two. The combs also have to be free of honey and pollen.

D) Chemotherapy or drug-feeding.

As well as removing the reservoir of spores on the combs, the bees must be cleaned up as well.

Decontaminated combs + infected bees → contaminated combs + infected bees, which is back where you started from.

The only way to treat Nosema in the bees is by feeding drugs, and the only drug which is effective (or legal) is fumagillin (sold as Fumidil-B).

To reduce the spring peak of Nosema infection, fumagillin must be fed in the autumn. It must be fed in sugar syrup, which the bees store as honey, so that workers have access to the drug right through the winter. It is no use whatsoever mixing it with water and sprinkling it over the top bars.

Fumagillin must also be fed at the recommended dosage. Half-strength doses don't give half protection, they give no protection at all. They don't save money on the drugs bill, they completely waste what money has been spent.

Minimum dosage for full colonies is 8 litres of 2:1 sugar syrup which contains 25 mg fumagillin/litre, or in other words 200 mg of fumagillin per colony. Note that I'm talking about the active ingredient fumagillin, not the commercial drug Fumidil-B, which contains only a proportion of the active ingredient. The small bottle contains 0.5 g of fumagillin (active ingredient), the big bottle 9.5 g.

At commercial rates of $109.59 per 9.5 g bottle, each feed costs $2.31 per hive for the drug only. Sugar, feeders, labour, and vehicle running are extra.

Short-term control of Nosema in queens in mailing cages is possible by using fumagillin in water. See the Beekeepers' Bulletin vol. 5 no. 2 (November 1983).

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ROYAL JELLY

At the last Apimondia Congress in Budapest, one speaker reported on the royal jelly market in Japan. Domestic production is said to have started in 1959, and now totals 10.25 tonnes per year. A further 137 tonnes are imported each year (from Taiwan and the People's Republic of China), and the total market is worth $US 220 million per year. That's $US 1 493/kg, or $NZ 65/oz.

The increase in demand for royal jelly is thought to be due to three things: a return to traditional oriental medicine, a reaction to an excessively industrialised lifestyle, and an increase in the number of elderly people in Japan.

Reference: Speedy Bee 12 (10): 18 November 1983.

WARNING - KILLER JOURNALISTS INVADE

The "killer bee syndrome" of North America is coming closer to New Zealand. The bees aren't, but the sensationalist mentality responsible for a lot of undue public concern in the US is affecting some of the less scrupulous newspapers close to home.

The German wasp is a new pest in Sydney, and that city's "Daily Mirror" newspaper for 17/2/84 had a front-page story on the insect. It went under a 50 mm-high headline (that's 2 inches)

KILLER WASPS INVADE

with the sub-headings "Sydney suburb hit", and "Deadly wasps hit Sydney".

We saw the same kind of thing with the chalkbrood exercise in Northland. The "Northern Advocate" for 26/1/84 ran a fairly sensible story which contained the message that "chalkbrood should not adversely affect the beekeeping industry or .... kiwifruit pollination", and that chalkbrood "was not a serious disease". But the paper still had to run it under the headline

KILLER DISEASE OUTBREAK

SPARKS MAJOR MAF

SURVEY

BREEDING RESISTANCE TO CHALKBROOD

In an excellent review of chalkbrood disease, an English authority on the subject (Heath, 1982) stated that:

"Experimentation with this disease is dogged by the difficulty that control colonies frequently show high levels of chalkbrood infection. Unless very large numbers of colonies are used, it is difficult to detect whether any manipulation or chemical treatment is having a significant effect. Many published results are suspect for this reason. In the author's experience in south-west England, it has been possible to detect Ascosphaera apis in any colony of bees so far investigated if the search is diligent enough. It appears, therefore, that we may well be dealing with a disease where exposure to the pathogen is the usual situation for a larva, and the development of infection is mainly dependent on the physiological and environmental conditions of the larva at the time. A. apis is therefore best regarded as an opportunistic pathogen which is efficiently dispersed and very widespread. At our present state of knowledge it seems that the selection of resistant strains of bees is most likely to advance control of the disease." (my emphasis)

Some of the pioneering work on disease resistance (DR) in honey bees was done by Rothenbuler in the late 1950s. He found that "disease resistance" was actually a measure of house-cleaning characteristics, and that it was controlled by two genes. One gene causes the uncapping of dead brood cells, and the other causes the bees to remove the dead material. The genes are quite independent, and both are recessive.

Variations can be observed between different colonies and their tendency to remove chalkbrood mummies. Because of the dry state of mummies and their ease of removal from the cell (as compared with AFB scales), it seems that an increase in the frequency of house-cleaning genes in a population should also increase the resistance to chalkbrood.

In a preliminary test of this theory, a team headed by Martha Gilliam of the USDA (Gilliam et al., 1983) tested the ability of various colonies to uncap and remove dead brood. Daughter queens were raised from the most "susceptible" and "resistant" colonies, and their colonies tested again. It was possible to have "resistant" colonies nearly twice as good at brood removal as "susceptible" ones, even after just one generation of breeding. (The difference was not statistically significant because of the small number of test colonies, and the idea obviously needs further study.)

House-cleaning ability, however, may be something you wish to consider in your queen breeding programme. The steps for testing it are relatively simple:

1. Any colony with brood at all stages may be tested, including a nuc.

2. Test a minimum of 10 colonies at one time.

3. Be sure the bees you are testing come from the queen that is in the hive. Wait for two months after introducing a queen before testing.

4. Cut squares of healthy, sealed brood approximately 40 x 40 mm from any comb and place in a deep freeze for at least 24 hours. Be sure that all dead brood was killed at the same time, stored in the same place, and is free of pollen or honey residues.

5. Place the squares of dead brood back into the combs and insert these in the test colonies.

6. Examine the brood after 24, 48, and possibly even 72 hours.

7. Count the proportion of dead brood uncapped and removed. DR colonies should uncap and remove most of the dead brood within 24 hours, and all in 48 hours.

8. Expect to find about 1 in 10 or 20 DR colonies. Expect also to find differences in the rate of uncapping and removal with different places and conditions (e.g. spring versus honey flow).

9. Be sure to select for other characteristics at the same time. You don't want DR bees that don't gather honey, or that always chase you out of the yard.

10. Do not use samples of actual diseased brood to test for DR. Use only healthy brood you have killed.

Gilliam, M.; Taber, S.; Richardson, G.V. 1983. Chalkbrood disease and hygienic behavior of honey bees. Gleanings in Bee Culture 111 (3): 258, 264-265.

Heath, L.A.F. 1982. Development of chalk brood in a honeybee colony: a review. Bee World 63 (3): 119-130.

Taber, S. 1982. Bee behavior: breeding for disease resistance. American Bee Journal 122 (3): 177-179.

Taber, S. 1982. Bee behavior: determining resistance to brood diseases. American Bee Journal 122 (6): 422-425.

International Bee Research Association

I wrote a little about the IBRA in the Beekeepers' Bulletin vol 5 no 2 (November 1983), soon after the NBA resolved to become a member of this important organisation. Now some major changes have taken place in the IBRA.

Most significantly, the IBRA's director for the past 35 years, Dr Eva Crane, has retired. The Association's development to its present state, where it occupies a major position in the beekeeping world, is due largely to Eva Crane's enthusiastic devotion to her job.

The other change that is happening to the IBRA affects us all - world recession. Its influence has meant that IBRA now receives no long-term grants for its work, forcing it to rely solely on short-term income. This is a difficult position to be in, especially as IBRA does not possess an adequate general reserve fund to tide it over temporary and unforeseen financial crises. That is why Dr Crane has now made an appeal, named by Council the Eva Crane Appeal, for donations to boost the Association's financial resources.

Many people have contributed already to the fund, and assistance to it might be something your branch is prepared to consider. Contributions to the Eva Crane Appeal should be addressed to Mr David Smith QC, Honorary Secretary IBRA, Hill House, Gerrards Cross, Bucks SL9 ONR, England. Cheques should be made payable to the Eva Crane Appeal.

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FOR THOSE WINTER'S NIGHTS

Did you know that you have access to an excellent beekeeping technical library? Well you do, if you're a member of the National Beekeepers' Association.

The NBA library contains over 350 books, as well as magazines (bound and unbound), pamphlets, and notes from MAF courses. It is housed at Milburn in Otago, where it is cared for by John Heineman.

To help members get the most use from the library, John has just compiled a thirty-page catalogue, which lists in alphabetical order all material held by the library. It also has subject listings to help with selecting books on

particular topics. The catalogue costs $2.40 post paid, and once obtained it can be kept up to date by adding in the 'library notes' from each issue of the New Zealand Beekeeper.

This library has got to be the bargin of the century. John Heineman will send you full details of the lending procedure, but in summary they are: when first enrolling send $3.00 as a float against further use. Loan fees are 30¢ per book (per month), reference books on long-term loan $1.00 per year; bundles of magazines 30¢ and pamphlets 5¢, all plus return postage.

I suspect that this library might not get as much use as it undoubtedly deserves. It is there for you, and it's up to you to make use of it. I'm sure that none of us can claim to have finished learning about bees, so how about making a resolution - to read at least one book a year from the library. You might be surprised what's there!

The catalogue has another use - telling you what's not there. If your branch has a small profit at the end of the year, instead of (or as well as) spending it on something for the branch, why not donate a book to the library. It's only kept in new books by such donations.

For copies of the catalogue, and any further information about the library, contact:

Mr J Heineman
NBA librarian
P O Box 112
Milton
Otago

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Beekeepers in the Bay of Plenty have found that considerable savings can be made by ordering Fumidil-B from overseas. They are doing this as a group and pooling orders - for further information contact Norm Deans at:

Mr N A Deans
Ohauiti
R D 3
Tauranga

HONEY HOUSE CONSTRUCTION

More on floor and wall coatings. Revertex Industries put out three products that could well interest beekeepers.

Floors

New or existing floors can be treated with "Terra Kote", a coating which consists of a water-based epoxy base, with a polyurethane-based top. It normally comes with colour flakes in, but I don't think these look too good in a honey house. A clean floor looks dirty (although I suppose a dirty floor can also look "clean"), and some health inspectors take a dim view of such things being used. However, Terra Kote can be put down in pastel colours without the flakes.

Application by licensed applicators only, about $\$30/m^2$ applied with flakes, and a bit cheaper for plain colours.

Walls

- "Situflex" medium-duty coating. A high-build paint (15x thicker than ordinary paint) for areas not subjected to excessively hard wear. Gives a smooth, high gloss finish. Two year guarantee.

- "Situclad" heavy duty wall cladding. A jointless fibreglass wall cladding system which is applied to new or existing walls. It is resistant to physical abrasion and chemical corrosion, and is used in freezing works, factories, and the like.

For further information contact the company's South Island technical adviser:

Bob Cowrie
Revertex Industries (NZ) Ltd
P O Box 13 155
Christchurch Ph 64 918

or one of the licensed applicators:

R F Lenting	Phone Nelson 89 729
Bryan Mayers	Phone Nelson 520294
T H Barnes & Co Ltd	Phone Blenheim 89 329
E J Hornsby Ltd	Phone Greymouth 7641

THE CASE AGAINST DRUG FEEDING

Japan is one of our more important honey markets, and in the past every shipment has had to be analysed for drug residues. At over $150 per analysis this was quite expensive, and seemed unnecessary in view of our laws which practically prohibit drug feeding.

After a long exchange of words with Japanese government officials, New Zealand honey can now be shipped without analysis. The official MAF certificate has been modified to include the endorsement that the honey is "free from antibiotics".

New Zealand is the only country in the world to have this privilege. It was hard-won, and could be easily lost forever if beekeepers try to cut corners.

No drugs can be fed to bees to control or prevent disease, except fumagillin (Fumidil-B) for the treatment of nosema disease. Its use is subject to the legal provision that it is not fed either during or immediately prior to the honey flow, which is to reduce the risk of fumagillin residues occurring in honey.

Don't feed any other chemical (drug) for control of bee diseases, including chalkbrood.

News from overseas indicates that awareness is increasing about drug residues in food, and not just in Japan. The United Nations Food and Agriculture Organization (FAO) and the World Health Organization (WHO) have formed a group consultation for the purpose of studying residues from the use of veterinary drugs and feed additives. The consultation's recommendations could lead to further regulations related to such items, and its formation could be an opportunity for importing nations to raise additional non-tariff trade barriers on livestock products.

Reference: Gleanings in Bee Culture 111 (11): 575 (1983).

UNCAPPING COMBS BY GENTLE MELTING

I pass this on for what it's worth. After you've increased your fire insurance cover by ten times, you might want to try it out. In an article in the Finnish beekeeping journal Mehilaishoitaja 17 (1), 1983, one Kauke Ahonen reported on his method of uncapping combs of honey with a propane torch.

1. The comb is placed in its normal upright position over an uncapping tub or other suitable device (not necessary when method is perfected).

2. The flame from a normal, cylindrical torch tip is swept rapidly across the cappings, with the flame held parallel to the face of the comb. The side of the flame contacts the wax, not the point of the flame.

3. The cappings will barely melt. The wax will form beads around the rims of the cells.

4. Too much heat melts the wax and honey together which forms a solid film (new cappings) over the comb.

5. Properly done, there is no loss of wax, no loss of honey, and all comb cells are open for extraction.

While this approach may be an excellent method for a small beekeeper who wishes to avoid the "cappings problem", it is impractical on a large scale. Or is it? How about an industrial laser?

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Once upon a time a handsome honey bee
Fell in love with a butterfly he met in a tulip tree.

He said "I love you madly and I want to share your life.
Let's fly away together - will you be my wife?"

She shook her head in sorrow, "No no no" cried she.

"For I am a monarch's daughter, and you're just a son of a bee".

- Anon.

In the spirit of CER, and just to show that we can laugh at ourselves, how about a couple of jokes from across the Tasman:

Q. How do you get a New Zealander into small business?

A. Put him in a big business and wait.

Q. What is the capital of New Zealand?

A. About five dollars.

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WELL .....

Bruce White, principal apicultural officer for the New South Wales Department of Agriculture, had this to say in the December issue of "The Australasian Beekeeper":

Honey Marketing

"There is no doubt that the New Zealand honey industry is a far better marketer of their product than their Australian counterparts. The motels I stayed at recently in Taree and Glen Innes both served New Zealand Blue Bonnet honey to guests in portion packs."

Andrew Matheson

A G Matheson
APICULTURAL ADVISORY OFFICER

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