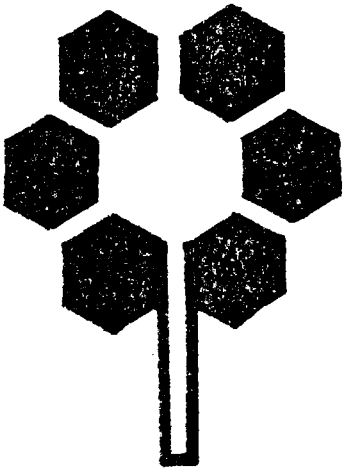
THE PROCEEDINGS OF THE

1974 BEEKEEPERS' SEMINAR



Taupo August 13-15 1974

Theme "HONEY" Its Production Processing Packaging & Promotion

Organised by the Ministry of Agriculture & Fisheries

Assisted by the National Beekeepers' Assn. New Zealand Incorporated.

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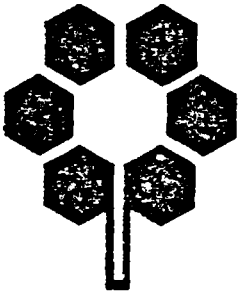

1974 BEEKEEPERS' SEMINAR

TAUPO AUGUST 13-15

EDITED and COLLATED BY

G.M. WALTON
APICULTURAL ADVISORY OFFICER
PALMERSTON NORTH

NOVEMBER 1974

INTRODUCTORY COMMENTS

This Seminar was organised by the New Zealand Ministry of Agriculture and Fisheries and assisted by the National Beekeepers' Association of New Zealand Inc. The theme of the three-day Seminar was HONEY: ITS PRODUCTION, PROCESSING, PACKAGING AND PROMOTION.

The venue for the Tuesday and Thursday conference sessions was the Lake Taupo Yacht Club Hall. The field-day on Wednesday 16 August involved a chartered bus trip to two leading honey-houses in the area: Acacia Bay Apiaries Ltd. and Arataki Honey Ltd. The hosts for the field-day were Mr Robin Jansen and Mr Russell Berry respectively.

Approximately 150 beekeepers and visitors attended the conference sessions and 165 attended the field-day.

Chairmen of Sessions

D.A. Briscoe	(Field-day)
J.D. Lorimer	(Tuesday afternoon)
E. Smaellie	(Thursday afternoon)
G.M. Walton	(Tuesday and Thursday mornings)

Organising Committee

A.W. Bennett	(liaison officer)
D.A. Briscoe	(field-day coordinator)
J.D. Lorimer	(treasurer)
G.M. Walton	(convenor)

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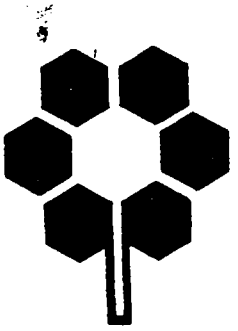

OPENING ADDRESS

Mr M.L. Cameron
Assistant Director-General
Ministry of Agriculture
and Fisheries.

PRODUCTION AND PROCESSING

It is very pleasing indeed to see such strong support from the beekeeping industry for this Seminar in Taupo. I would extend a warm welcome to you all, and especially our (6) Australian visitors, and hope that your time at Taupo is an enjoyable and profitable one.

I believe it quite significant that this Seminar is being held here in Taupo. Apart from being a very pleasant spot, the Taupo region exemplifies what has been happening in agriculture in recent years. Thirty years ago this countryside was mainly scrub-land, with very little agriculture. Today it is an important, thriving livestock and general farming region. I am quite sure that agriculture in this area owes a lot to the honey-bee, for her free pollination service. In the volcanic plateau region I understand that there are more than 10,000 hives producing in excess of 300 tonnes of honey per annum. But it is the honey-bee's pollination role that is the more important one. It is a pity that this role is not recognised by all farmers, probably because the honeybee's value is not an easy thing to put a charge to.

In looking through the programme I can see that you will be presented with a very wide coverage of the industry as a whole - honey production, processing, packaging and promotion. With respect to production, the problems faced by honey producers in improving output efficiency, better management, mechanisation, and general economic well-being, are shared by all of the primary industries. Again, in common with all industries, you must pay particular attention to quality, purity, packaging and marketing of your product. It is becoming increasingly apparent that pure and natural products have a real selling point in today's world; whether it is meat, milk, or honey. As a part of the food industry

the first thing you must have is the confidence of the consumer, for he/she is demanding that food is pure, clean and produced under hygienic conditions.

Although New Zealand export honey is regarded as of the highest quality and grading standards, the industry should become well aware of recent developments regarding the Codex Alimentarius standards. This subject will shortly be discussed on the programme but I wish to point out that it is in our interests that we agree to an internationally accepted food standard which will assure us entry into all those markets with which we wish to trade. While we do not agree with all the draft proposals for honey, and we have certainly said so, it is in our interest, and the consumer's interest, that standards are adopted.

It is also important that you think of the New Zealand consumers. Most of New Zealand's production is consumed within the country. We have the highest consumption of honey per head of population in the world. I am very pleased to see that emphasis has been given to the home market in the Seminar programme.

When profit margins are slight it is most difficult for any agricultural producer to obtain a reasonable living and at the same time plough money back into his enterprise to improve efficiency in order to meet a modern market. As a result of the dramatic increase in honey prices in recent years it would be fair to say that there are opportunities for honey producers to re-equip,to expand,to improve methods of management, to become more efficient and to produce a better quality product. I cannot envisage any primary industry that isn't going to have its ups and downs. You should take advantage of the "ups" to weather the "downs".

With respect to the Ministry of Agriculture and Fisheries we have three main functions: advisory, regulatory, and research. I think I can say that the industry is well serviced by the quality and the numbers of Ministry staff. One recent development has been the appointment of Apicultural Advisory Officers as a back-up to Apiary Instructors who are concerned mainly with husbandry and regulatory work. We have appointed Mr Walton and

Mr Reid as advisory officers covering the North and South Islands respectively. They are both graduates from New Zealand Universities and who have received further apicultural training at the University of Guelph, in Ontario, Canada. Both Mr Walton and Mr Reid provide a technical back-up to Apiary Instructors. They are concerned with new technology, economic and management aspects of the industry, field trials, survey work and Seminars of this type.

I would like to thank the National Beekeepers' Association in assisting with the organisation of this Seminar, and in particular, Mr Lorimer who is treasurer for the organising committee.

Finally, the organisers of this Seminar have set out to do three things:

Firstly, to familiarize you with all the recent developments in the industry with respect to honey - its production, processing, packaging and promotion.

Secondly, to give you an opportunity to meet and familiarize yourself with the staff of the Ministry and the service that can be rendered to the industry.

Thirdly, and I think most important, to give you an opportunity to contribute and share your thoughts and experiences formally here at this Seminar, and informally outside of the Seminar sessions.

Ladies and Gentlemen I declare this 1974 Beekeepers' Seminar open.

CODEX ALIMENTARIUS - THE INTERNATIONAL STANDARDS FOR HONEY

Mr Murray Reid
Apicultural Advisory Officer
Christchurch.

Introduction

Within the Ministry of Agriculture and Fisheries various phrases become fashionable from time to time. We've had such tit-bits as "meaningful dialogue", "work planning" and just recently "fire-brigade exercise" has become popular. Beekeepers have their own "in phrases" too. I've heard "one man, one vote" or "delegate's vote" at various times and "hive levy" seems to be another popular phrase at the moment. But a term that we are all going to hear a lot more of in the near future is CODEX ALIMENTARIUS. I think most of you will have heard of the term but I doubt if many of you could tell me exactly what it is.

Codex Alimentarius

Codex Alimentarius literally means a manuscript or document of food; or more simply, a food standard which is designed to operate on a world-wide basis. A Codex Alimentarius Commission was set up in 1962 by a joint body from the World Health Organisation and the Food and Agriculture Organisation of the United Nations. Their primary object is to establish standards for food that will protect the health of consumers and provide confidence amongst food traders. With respect to honey, the Codex Alimentarius Commission has recommended a set of standards for honey and honeydew in Europe (see "The New Zealand Beekeeper" February 1971). Each European country has been asked to either accept or modify the proposals, with the view to adopting a European regional standard. Eventually, it is hoped that a world-wide Codex Standard will be formulated.

New Zealand has been represented at meetings of the Codex Alimentarius Commission considering the quality standards for honey.

Although New Zealand agrees in principle to the establishment of an international Codex for honey and other food products it nevertheless has strongly opposed, along with other countries including the U.S.A., certain aspects of the draft proposals. New Zealand has questioned the validity of using diastase and hydroxymethylfurfural (H.M.F.) levels as appropriate indicators in measuring heat damage to honey. The draft proposals do not state at which point the standards should apply; producer or consumer, exporter, importer, wholesaler or retailer? Can a beekeeper be held responsible if a retailer displays the honey under strong lights and heat in a shop window for months or even years? Where does the responsibility lie if honey is damaged by being stored near steel decks on a ship passing through the tropics?

We must consider these recommended standards and see how they affect our management practices. I should mention here that we have tested a wide range of New Zealand honey samples and in most cases we can meet all the draft Codex requirements. However, some extractions of manuka, citrus, buttercup, tawari, pohutukawa and rata fall below or come very close to the limits. If the honeys are "heated" in any way, the problems are compounded.

The Codex definition of honey

Honey has been defined as "the sweet substance produced by honey bees from the nectar of blossoms or from secretions of or on living parts of plants, which they collect, transform and combine with specific substances to store in honey combs." This is a very general definition of honey and it is further defined according to honey source. Blossom or nectar honey is the honey which comes mainly from nectaries of flowers, whereas honeydew honey is the honey which comes mainly from secretions of or on living parts of plants. Its colour varies from very light brown or green to almost black.

The standards can best be summarised in table form with some recent analyses of New Zealand honey for comparison :

TABLE 1. THE CODEX ALIMENTARIUS STANDARDS FOR BLOSSOM HONEY AND HONEYDEW HONEY COMPARED WITH UNHEATED NEW ZEALAND HONEY AND SUGAR SYRUP "HONEY".

	Codex blossom honey	Codex honeydew honey	Unheated N.Z. honey*	Sugar Syrup "honey" [1]
Invert sugars (glucose, fructose)	⩾ 65%	⩾ 60%	74.4%	< 60%
Sucrose	⩽ 5%	⩽ 10%	1.4%	> 10%
Moisture	⩽ 21%	⩽ 21%	16.7%	-
Water insoluble matter	⩽ 0.1%	⩽ 0.1%	-	-
Ash (minerals)	⩽ 0.6%	⩽ 1.0%	0.10%	-
Acidity (milli equiv/kg)	⩽40	⩽ 40	21.7	15
Diastase (Gothe scale)	⩾ 8	⩾ 8	48	-
Hydroxymethylfurfural	⩽40	⩽40	5.9	-
or for low enzyme honeys				
Diastase (Gothe scale)	⩾ 3	⩾ 3	-	10.9
Hydroxymethylfurfural (mg/kg)	⩽15	⩽ 15	-	-

⩾ means more than or equal to

⩽ means less than or equal to

* An average of three determinations from fresh comb honey

We can see from this table that honey is a fairly complex mixture of chemicals and compounds. Yet, the major components of honey are simple sugars and water. However, there is a tremendous variation in chemical composition of honeys from different districts, from different floral sources, and even within the one floral source; and every extraction needs to be evaluated on its own merits.

Enzymes

To determine the effects of heating or storage on honey we want factors that are easily measured, not present in fresh natural honey, responsive in a predictable fashion to the environment, and independent of honey type or composition in its response to temperature and time.

The two main factors used at the moment to determine honey damage, through heating and storage, are the destruction of enzymes and the build-up of hydroxymethylfurfural.

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1. Popescu, N., Popa, C., Popa, A., and Brinzac, B. 1965 Physiochemical composition of honey from bees fed on sugar syrup. Apicultural Abstracts 174/67

All honeys contain a number of enzymes, the main two being invertase and diastase. Invertase is provided by the bees to "digest" sucrose molecules into glucose and fructose. Diastase on the other hand reduces starch into maltose (a sugar similar to sucrose). Diastase is sensitive to heat damage and can also be measured easily so it has been used for many years to test honey for overheating. Whether or not honey is harmed in a nutritive sense by limited amounts of heat is debatable. Certainly diastase itself has no real nutritive value.

However, there are problems with using enzyme destruction as an indication of heat damage because:

a. Diastase is gradually lost over a long period of time at moderate temperatures, e.g. 200 days (6½ months) at 30°C (86°F) is equivalent to 5.3 hours at 70°C (158°F) as far as diastase loss is concerned; diastase is the most heat stable of the enzymes in honey.

b. The laboratory methods of analyses are not particularly accurate, are slow and complicated procedures,and cost some $30 per extraction.

c. A single diastase determination cannot be used to provide an idea of heat and storage history of a honey. One must also know or assume the starting diastase value at the time when the honey was fresh and this is hardly possible from a practical viewpoint. Also, values for fresh honey are known to vary over a wide range and working from averages is not in keeping with Codex requirements.

Hydroxymethylfurfural (H.M.F.)

H.M.F. is formed from fructose (or laevulose) when the honey is overheated. It can also be formed when honey is stored at room temperatures for a long time. In spite of this H.M.F. is much more suitable as an indicator of excessive heating than the enzymes. However, we do not know enough about all the factors affecting its production. For instance, it does not form at the same rate in all honeys. But in some New Zealand honeys tested to date the build-up of H.M.F. reached the 40 mg/kg limit before the diastase level dropped to eight units.

The increase in H.M.F. with time was negligible at 4°C (39°F) and 20°C (68°F) but at 30°C (86°F) the H.M.F. level increased by about 0.3 mg/day. At 40°C (104°F) this was about 2 mg/day. In practical terms this means that a honey with an initial H.M.F. level of 10 mg/kg will pass the 40 mg/kg limit in 100 days at 30°C or 15 days at 40°C. Some German buyers set a limit of 25 mg/kg so as to allow them a margin for melting out the drums and processing the honey. If this becomes common practice we are going to be affected even more. We must always remember that the effects of heat accumulate so that the effects of processing and storage must be considered together.

The proposed adoption of international standards for honey should at least make New Zealand producers more aware of their product. Mr Rope, New Zealand Government's honey grader, will look at this in more detail in the following talk.

HONEY QUALITY - NEW ZEALAND PRODUCERS ARE FACING A CHANGING SITUATION

Mr Colin G. Rope
Honey Grader
Auckland.

Introduction

Mr G.M. Reid has just outlined the recommended standards for European honey. I could spend some considerable time outlining the specific ways in which New Zealand beekeepers are being, or are likely to be, affected by the changing situation with respect to honey quality. However I believe I can best illustrate the points I wish to make by way of four examples.

The German Standards for Honey

Operating right now in the third largest importing country for our honey are a set of standards much the same as the Codex Alimentarius recommended European regional standard for honey. Last year, a vendor of New Zealand honey in Mannheim was prosecuted by the police for selling honey which had been impaired by heating and did not comply with German regulations for honey. The New Zealand Grade Certificate for this export honey showed the condition points as 100, which is of marked contrast in appraisal of quality. The German Laboratory Report states "flavour" as being "without fault", and the decision of the authorities was based on the lack of the enzyme diastase, the excess of H.M.F. and the absence of saccharase.

Another shipment destined for Hamburg was found not to comply with German food laws for the same reasons and this shipment too had to be diverted to another country. It was in fact swapped with another shipment intended for Dublin. The extra freight costs involved had to be borne, eventually, by the New Zealand beekeeper. Although that honey was considered unfit for German gastronomy, it no doubt contained an abundant supply of calories to satisfy the energy needs associated with the Irish temperament!

Need it be said that honey which fails to meet the German requirements for table honeys may be imported as "Industrial Honey" at appropriate prices? Our Ministry is unable to produce any evidence to support the idea the German standards constitute a "price barrier".

I have here a copy of an order dated 7 May 1974 from a German Importer and headed as follows :-

Specification for N.Z. Bee Honey

Article	Bees Honey "set-honey"
Packing	(1) in barrels of 200 kg
	(2) in cans of 25 kg
Quantity	60 tonnes
Quality	Homogeneously light amber, guaranteed pure, homogeneously aromatic without impure odour and taste, filtered twice, without impurities and/or foreign bodies (of barrels, cans etc.) moisture contents approx. 18%, not heated, formol number minimal 1.0, diastase number minimal 14, saccharase number minimal 9, hydroxymethylfurfural max. 1.5 mg % reaction Fiehe negative, ashes minimal 0.1 % acide 0.1 - 0.4 calculated as malic acid, albumine according to Lund minimal 0.5 ml creamy (crop 1974).

Well, those are the specifications an exporter to Germany is now faced with. They are in line with the Codex Standards as being recommended for adoption throughout Europe by the United Nations agencies and if adopted by the European Block, New Zealand beekeepers will need to re-think their honey-house procedures and their storage and transport methods. With British entry into the European Economic community I think an enforced change in our approach to honey handling may not be too far away?

Definition of the word "heat"

We must acquire a clear understanding of the word "Heated". It does not mean "cooked", "burnt" or "hot" alone. Heated has a wider meaning and means honey which has been subjected to temperature.

We need to realise that everything is being heated all the time - you and I right now are being heated by the temperature of this room at around 20° celcius but we are not being cooked or burnt, are we?

I want to take you one step further now and ask you to grasp the point that married to temperature is another factor, time, and you can't have one without the other.

If we think again about honey we can say with confidence a temperature of 30° Celcius on honey for one day would bring about an insignificant amount of damage to the enzymes; but around the month of February when honey is being subjected to some 30°C for 20 or 30 days the situation becomes significant and such conditions should not be condoned for export honeys.

Damage to enzymes, caused by heating, adds up.

And as Mr Reid explained earlier, heat damage can be measured. Let's look more closely now at our handling processes and ask ourselves whether it is really essential to apply all the heating traditionally applied to New Zealand honey? We may elect to answer "yes" to some of the questions but we might find some "No's" as well.

a. On the hive - Do we have to leave our crops on the hive in the summer sun for weeks after the honey is capped over and ripened by the bees?
b. In the honey house - How long need honey be kept in a warming room before it is readily extractable?
c. Is a steam heated uncapper the only way to prepare combs for extraction?
d. Could one manage without a steam heated uncapping tray?
e. Is there an alternative to hot water - jacketed cappings - bins; honey heaters; and extractor coils?
f. What is the temperature where export bulk honey will be stored in the honey house, at the honey depot, or outside in the yard, in the sun?
g. What is the temperature in a general cargo hold on a ship for one week as it passes through the tropics, especially if the honey is placed near the steel decks or hot boiler-room bulkheads?

All these questions I have asked need to be answered and given due consideration if the future export market is to remain a lucrative one.

In the meantime, beekeepers need to watch future developments very closely; and I would suggest to those who may be contemplating capital expenditure on melters and honey heaters to weigh up the alternatives of spin driers, centrifuges, and even drip tanks and presses - carefully - before they proceed to spend money, perhaps unwisely.

Container quality

I want to close on a different subject and start by saying that I believe consumers are entitled to expect a reasonable standard of common hygiene with regard to the foods they eat; including honey. During my work I have observed containers in use that are no longer fit for storing food for human consumption.

Many producers upon receipt of their empty cans or drums are so irresponsible as to leave them lying in the grass outside in all weathers and far too many containers are entering commerce in a rusty, dented and generally dirty condition. The food lacquer linings on dented drums is usually cracked or damaged and permits reaction between the steel and the honey acids,impairing colour and condition of the food.

The repeated use of 4 gallon tins for up to 20 years or so is another thing that must be hard to justify in these enlightened times? Some beekeepers would benefit through taking more pride in the honey they produce and so treat it with the care and respect our product deserves. Not all drums used for packing honey are as unhygienic as the one I am about to display; it is the worst I have ever come across! (A rust-encrusted drum lid was displayed at this point). I make no apologies for displaying it here today as a reminder that one need not look too far afield anywhere in New Zealand to find containers no longer fit for the storage of honey and the need for improvement is obvious.

CODEX ALIMENTARIUS

ADDITIONAL COMMENTS BY :

Mr John Guilfoyle
Queensland
Australia

Mr Guilfoyle is a major manufacturer of beekeeping equipment in Australia. He has attended, addressed, and chaired sessions at many International Apicultural Congresses. In 1972 Mr Guilfoyle was the president of the 1st Australian Bee Congress arranged under the auspices of Apimondia, the international body of beekeeping organizations.

Apimondia, the international federation of apiculturalists, has thoroughly studied and examined the implications of the Codex Alimentarius. In fact they were the liaison body that worked with the World Health and Food and Agriculture Organisations of the United Nations in determining the honey standards.

Although we, as honey producers, may have reservations about some aspects of the Standards we should not lose sight of the fact that we are selling to consumers. The Present Standards are to protect the European consumer.

Dr Duisberg of Germany has played a significant part in drawing up these Standards, and I believe that if you have doubts about the Standards you should ask him how best your product could meet these requirements. The U.S.A. has done this, and Australia intends to bring Dr Duisberg out to examine the Australian situation at first hand.

From my travels there is major concern about the adulteration of honey that is taking place, and will take place, around the world. Codex Alimentarius is the only barrier for beekeepers against the encroachment of sugars. From Mr Reid's table it is in the main only the enzymes and H.M.F. levels that make honey any different from sugars - so don't back away from these standards.

HONEY-HOUSE DESIGN

Mr Grahame M. Walton
Apicultural Advisory Officer
Palmerston North.

INTRODUCTION

In the short time that I have available to discuss this important topic I must of necessity be brief. I can provide only a basic outline. Arising out of this talk it is planned to prepare a more detailed publication on honey-house design.

Honey-houses are very much a personal thing. What may well suit the requirements and ambitions of one beekeeper may be totally inadequate for another. There is no ideal specification for a honey-house. A most satisfactory honey-house arrangement for 500 hives will undoubtedly prove inadequate for a 2,000-hive, let alone a 10,000 hive-, outfit. Again, a honey-house adequately coping with light bodied clover-type honeys would probably be unsuited to the heavier-bodied manuka and ling heather honeys.

In building a honey-house the most important step is the first one - the planning stage. Without adequate planning - looking at the options, examining the short and long-term requirements, and plotting a step by step course - the final objective would unlikely be achieved successfully.

Your aspirations and requirements

The planning of a honey-house and its equipment is a personal one and is governed by your, or your company's, present and future ambitions and requirements. You need to examine the size and scope of your operation. How many hives, apiaries? What methods of management do you use or intend to use? You need to examine your product - honey. Have you a ready market for the honey-types you plan to produce? Is it economical? Have you made allowances in your proposed development programme for the labour and equipment needed both in the field and in the honey-house?

Have you sat down with your accountant and looked at your state of finance? Have you sounded out sources of mortgage finance? And have you considered that there may well be contract honey extraction facilities available that could save you the capital expense of building and equiping a honey-house?

Where to site the honey-house

So you have decided to build a honey-house. The next question is; where to site it? Very few beekeepers, in practice, ever ask this question, let alone answer it, for they have already become established in the town of their choice, and they may have even purchased the land on which the honey-house will be built.

However for an efficient business operation a beekeeper must consider objectively his proposed honey-house location. It should be fully serviced with electricity, water, telephone and sewerage. The honey-house should be handy to a town with good transport, tradesmen, engineering and general supply services, and with a reasonable degree of part-time and seasonal labour.

From the point of view of a building investment, the honey-house should be located on industrially-zoned land, whereas the owner's residence should be located on residential land. Too often is the case where the valuation of both house and honey-house is lowered because they are located on the same land adjacent to one another. Difficulties may well arise in trying to sell land with this type of building combination.

Preference should be given to a flat section.

Building construction

For a medium to large enterprise you should consider a factory-type building, single storey, with insulated steel framework construction on concrete foundation and floor. A building of this type is adaptable, capable of expansion and has a reasonable re-sale value.

Walls, windows and doors should be designed with the movement and storage of bulk equipment in mind. An internal truck-loading dock, or docks, could be provided, level with the deck of the truck. On the other hand, if fork lift trucks are contemplated one level floor is desirable. Above all, the building should be bee-tight.

In building a new honey-house beekeepers should familiarise themselves with local authority by-laws and Health Department requirements.

Honey-house layout

The extraction room is the hub of the honey-house. It is an enclosed room for the uncapping of combs, extraction, warming and straining of liquid honey. It may or may not be partitioned off from the honey tanking and packing area. The floor, walls and ceiling must be sealed or lined according to food hygiene requirements. The extraction room should give sufficient area for present and future honey-house equipment requirements, and enough passage-way for the flow-through of honey supers.

The truck loading and unloading area(s) should be within the honey-house building and handy to the extraction room. For the small to medium commercial unit a convenient truck bay arrangement is one with the deck of the truck at honey-house floor level. However for the larger enterprise a one-level floor combined with fork-lifting is a more flexible arrangement. In this latter case the concrete flooring must be stronger, the building larger (for vehicle mobility) and the roof higher (for stacking).

Between the truck unloading area and the extraction room should be an incoming storage area. In New Zealand we recommend the use of a "hot" room. If it is adequately designed, built and heated, a hot room helps ensure that honey is maintained as a quality product. A controlled hot-room can remove water from high moisture-content honey and can add it to exceedingly dry honeys (seldom the case in the North Island). A hot room aids in the extraction of honey from the combs. Radiant floor heating in the hot room is considered the

best when honey extraction is on a regular basis. Good air turbulence and thermostatic control (35°C, or 95°F) is important. The incoming storage area, or hot-room, should be large enough to hold at least one day's intake of honey supers, without the need to restack.

The storage of extracted supers should be handy to both the extraction room and the truck loading area. This same room may serve as a feed-honey or container storage area; however this equipment should not impede the daily flow-through of the extraction and storage rooms.

A timber, painting, engineering and spare parts workshop is essential in any medium to large honey-house. It may be incorporated within the storage room but for appearances and for functional reasons it is better that this be a separate room.

The size of the wax rendering room depends substantially on the method of cappings handling adopted in the extraction room. As the risks of fire are higher, this room should be somewhat isolated from the rest of the honey-house.

To complete the honey-house complex other rooms are desirable, if not essential. A toilet is a health and hygiene requirement. An office for your business dealings and a lunch room for your staff should be considered. A shop or display room for honey door sales may be an important adjunct to your method of marketing.

The size of the honey-house complex depends, of course, on many factors; including finance, the number of colonies, honey through-put, method of marketing, and the quantity of equipment. Although no hard and fast guideline can be indicated for the total area of a honey-house a rule of thumb is a 100-150 square foot (9-14 square metres) honey-house for every 100 hives.

Equipment

Honey-house equipment should be selected and designed to maintain a quality product, whether it is honey or bees-wax. For instance extraction combs should be white, not old brood combs; heat should

be used judiciously, and definitely not direct steam heat. Care is also required in the straining and storage processes. Stainless steel equipment is preferred.

The honey-handling equipment should have a capacity to meet an excellent season's production, and yet be flexible enough to meet future requirements. Equipment should be carefully selected so that they work in concert with one another, without stress or bottlenecks.

Equipment should be simple and standard, so that even unskilled employees can operate them. There is a wide range of standard equipment available, many items pioneered by New Zealand beekeepers themselves. Instead of buying standard, proven equipment many beekeepers exhibit the "do it yourself" kiwi characteristic of making their own. Unfortunately the "prototypes" on the rubbish pile behind the honey-house bear testimony to the cost of this experimentation - in terms of time, labour and finance.

Conclusion

A good honey-house design on a suitable section and containing efficient equipment is a valuable asset. A well designed building can accrue in capital value. The maintenance or improvement of honey quality, and a faster through-put of honey supers can lead to better honey returns. It is a pleasure for the employer and the employee to work in an efficient, hygienic honey-house.

HONEY-HOUSE FLOORING

Mr R. (Dick) H. Hobbs
Apiary Instructor
Palmerston North.

Introduction

Under the new Food Hygiene Regulations 1974, that come into effect on January 1975 honey-house floors are required to be constructed either of impervious and easily cleaned material that is resistant to wear and corrosion, or constructed of wood with the boards laid on a firm foundation and tightly clamped together. In both cases the angles between the floors and walls must be rounded off. For impervious materials such as poly vinyls, the flooring must extend up the wall to a height of no less than 76 mm (3 inches).

Beekeepers should familiarise themselves with these Regulations before laying down a new floor, or modifying the existing floor.

Wooden Floors

Because of its versatility, timber plays a very important part in the construction of floors in many honey-houses, and will for many years to come. To avoid shrinkage, it is important that timber used for flooring is thoroughly dry. Today, with the building boom, it is a problem to obtain dry flooring. This can be overcome by the use of particle board. Particle board can be obtained in sizes ranging from 8ft by 3ft to 12ft by 6ft and is slightly dearer than tongued and grooved flooring.

Wooden floors, including particle board, should be sanded down and the nail holes stopped then coated with a polyurethane clear plastic varnish or some other suitable material. Wooden floors that are not sealed against moisture are liable to become havens for honey yeasts that cause fermentation.

Concrete Floors

Today, with more mechanisation in honey-houses such as forklifts etc., there are now more concrete floors being put down in the new larger honey-houses. Considerable planning is required for a satisfactory floor.

The thickness of concrete may vary from one area to another. The minimum thickness of the floor is 3-4 inches for light loading, to 6 inches on which heavy machinery or trucks will be driven and parked. A membrane of P.V.C. sheeting should be laid before concrete is poured. This acts as a seal to prevent moisture working up through the concrete. This will eliminate problems that could occur later by moisture-drawing materials positioned on concrete floors.

As concrete dries it shrinks slightly causing cracks to appear. To prevent cracking the floor area should be cast in strips and when finished the joints between the strips should be sealed with a suitable plastic compound. Adequate steel reinforcement should be used in concrete floors. The use of steel reinforcement does not contribute significantly to the load-carrying capacity of the floor, so it does not permit any reduction to be made in slab thickness.

In the extracting room, where the floor is washed down with water after extraction, correct falls should be built into the floor to allow for drainage. The fall should range from 1 in 80 as the minimum, down to 1 in 60.

Concrete

Concrete is only as good as the ingredients that go into the mix. The approximate mix proportions by volume are: Cement 1 part, sand (dry) 2¼ parts, coarse aggregate (3/4 in.) 2.5/8 parts. Only sufficient water should be incorporated in the mix to produce a material having a consistancy which will permit maximum compaction. The use of ready mixed concrete as supplied by a local firm could have many advantages. Wear resistance, impermeability, and strength of the concrete will be greatly affected by the degree of compaction. The most effective method of compaction of concrete floors is with a surface vibrating screed, manual vibrator, or by hand tamping.

Finishing

Since corrosion starts at the surface of the concrete, finishing is of great importance. Plastering of the surface must be avoided at all costs as such a surface has low resistance wear, it dusts and crumbles easily, is porous and is very subject to corrosion. Steel trowelling will produce a surface having good wear resistance, and good corrosion resistance. Greater protection can be obtained by using a power float for final finishing. This machine consists of a rotating steel disc which puts a good finish to the top of the concrete that is superior to anything that can be obtained by hand methods.

If high wear resistance and imperviousness is required,a topping of specially selected high grade aggregate can be spread dry over the surface during the finishing operation and compacted into place with a power float. This is a specialised operation which should only be entrusted to contractors experienced in this class of work.

There are a number of products of modern technology developed and perfected over the years that can be used for waterproofing, hardening and dustproofing concrete. Some are added to the concrete mix while others are painted or sprayed on soon after the concrete is laid.

Today many beekeepers still paint wooden and concrete floors in their honey-houses. Some of the modern acrylic and epoxy resin based paints are very durable and when applied improve the imperviousness and appearance of floors.

Floor coatings

In recent years we have seen an increase in the number of spray-on seamless coatings which are applied as a multi-coat system to a prepared surface, which then becomes an integral part of the surface. Coatings of polyurethane and other chemical products of this type have several years of good performance to their credit in some honey-houses.

Polyvinyl Chloride (PVC) sheeting is used on many types of floors including honey-houses. It is completely flexible and may be installed around corners, right angled bends and over contours.

PVC sheeting may be repaired should damage occur in a small area without having to remove the whole sheet. These flooring coatings are applied by firms with trained applicators who are conversant with all preparation and application details. Because of the high cost of materials and laying cost of these floor coatings a written guarantee should be obtained from the firm of contractors who do the installation in case of poor workmanship or failure because of incorrect laying techniques.

SHIFTING IN THE HONEY-HOUSE

Mr Douglas A. Briscoe
Apiary Instructor
Tauranga

Today the approach to factors in the beekeeping industry are changing quite dramatically. Whether this is because younger men are growing into the industry or not I'm not too sure. However, units are becoming larger. This is natural I suppose, due to economic factors. With this trend to larger units it does bring about a certain amount of difficulties. One man can only do a limited amount of work in a given space of time and if units are to become larger, then the obvious answer is to bring in some sort of improved management programme. This will allow more work to be done in the same amount of time. The lack of a planned management programme is one of the factors that is indeed affecting the beekeeping industry at the present time.

In the apiary,mechanisation is playing a vital role today. We have boom loaders, we have larger trucks geared to handle more hives at the one time and we have motorised-type barrows that can be used within the apiary for loading and unloading both hives and bulk honey. It is by these means that the extra workload can be tackled.

In reality it is the weakest link in the chain that governs the overall efficiency of any business. While mechanisation is playing a very big part out in the field, or in apiary work, it is essential that the work in the honey-house itself is also capable of being handled to the same extent. If this were not so, the weak link in the chain would then be in the honey-house, or the handling of the product once it was brought back for extraction. It is this handling in the honey-house that we should look at in more detail.

Bulk handling of any product calls for mechanisation, proper, and good management, and the ability to handle heavier loads. The beekeeping industry is no different to many other industries in this respect. Gone are the days when honey was packed in 4-gallon (60 lb) tins with two of these tins to a wooden case. There are not very many producers that still use 4-gallon tins.

Today we have the concept of the 28 kg and 300 kg (5 gallon and 44 gallon) drums. These in themselves present quite a problem when it comes to handling or shifting them within the honey-house. I think we are all familiar with the old type hand barrow; the type of barrow that is used for shifting bags of wheat. For many years these indeed were a common sight in honey-houses, but today-, these barrows are really not on. It's virtually impossible to shift a 300 kilogram drum full of honey(something like 650-700 odd lbs). This type of barrow is not really capable of this sort of work.

When handling large weights in a honey-house, not only has consideration got to be given to the type of mechanisation or appliance that is called upon to do this work but it's also very necessary, I feel, to give very careful thought to the floor itself. A previous speaker has dealt with floorings in honey-houses in some depth. Whichever type of flooring has been selected, care must be exercised in shifting big weights about the honey-house. It is when handling a full 300 kilogram drum of honey with the orthodox hand barrow that is the cause of most floor damage - whether it is concrete or timber. This occurs when the drum is stood upright from the wheeling position. The drum invariably becomes upright with a bang as it drops down on its off-side edge. Edging the barrow under the drum does not cause all that much damage, but it certainly requires considerable effort. No floor, to my knowledge, will take this sort of continued punishment for very long. If a concrete floor has been plastered, invariably it is not long before the plaster will start to crack and break. Even a concrete floor laid and finished in the one original pour is quickly subjected to chipping. The surface of the concrete becomes broken and this is

where you can get little pockets of water and moisture allowing fermentation to get away.

So really, when thinking of moving heavy weights around a honey-house, consideration must be given to appropriate forms of mechanisation that can transfer drums, honey and hive bodies within a relatively confined honey-house space and to do it efficiently and relatively easily. I think there are only two ways that this problem, if we could call it a problem, can be overcome. Firstly is the use of the honey-house bogey. This is used in conjunction with timber pallets. Honey is stored or stacked on the pallet and the hand barrow is pushed in underneath. The pallet and its contents are lifted clear of the floor by a backward levering motion of the propelling handle. After moving the load the handle is brought back to the upright position and the pallet comes back to its resting place on the floor. Under these circumstances no damage occurs to the floor for the weight is lifted and lowered directly and squarely. The bogey is very useful in honey-house work. It can be made relatively light for light loads, or it can be made of more rugged construction for heavier loads. The honey-house bogey has been used to handle full supers of honey in many honey-houses. A sturdier concept could be constructed to allow for the use of heavier loads such as 28 kg drums or even 300 kg drums. In handling 300 kg drums, naturally, the construction must be somewhat heavier and the castors need to be broader so that the weight is transmitted to a higger floor area. This is quite a successful, handy, and compact type of barrow.

I have described the damage likely to be caused when tilting 300 kg drums. To my way of thinking the direct lift is the only satisfactory way of moving these drums about the honey-house, or even on the back of the vehicle. The second type of lifting device, specially designed for larger drums, is a type of hand barrow that could be constructed by any reasonable engineer. It embraces the pivoting or the lifting of the drum at a point above the centre line - in other words, towards the top of the drum.

When the purchase comes onto the hand-piece of the barrow the drum is lifted squarely. It remains square to the floor as the hand barrow is pulled back, at which stage a buffer on the bottom of the barrow will allow the drum to rest evenly on the barrow as it tilts back. This drum can be lowered again simply by raising the hand-barrow to the upright position. The weight of the drum keeps it square with the floor and it sits perfectly flat again, without damage to the floor.

For those who have a little bit more money in the bank or perhaps are on more friendly terms with the bank manager, a type of barrow with a hydraulic lift similar to the principle employed in the motor trade could be implemented. I think you are all familiar with the types of hydraulic jacks that the motor industry use. This sort of concept could have tremendous application in a honey-house. Of course it requires the use of pallets. The principle indeed is an excellent one in that the handle is brought back by a simple single motion or perhaps a double pump motion to lift the load clearly and squarely off the floor by only a half an inch or an inch or so.

These are the principles, Gentlemen, that I think are essential in being able to handle the larger weights in and around the confined areas of honey-houses. These weights today are accepted as part of the, shall we say, progress of the times and we have got to go along in our thinking with them and especially in the handling of them. We must gear ourselves by appropriate mechanisation. It not only saves us time and labour but it also spares our backs, not to mention the floors. Moving weights,around a honey-house is unavoidable and with a little forethought this can be done relatively easily.

CARE IN THE USE OF METHYL BROMIDE

Mr Brian M. Milnes
Apiary Instructor
Auckland.

As we all know, the principal insect enemies of bee combs in New Zealand are moths, of which there are two species (the large and the lesser wax moth); and if they are allowed access to stored combs they can become very destructive. The beekeeper's most valuable asset, apart from his bees, is a plentiful supply of drawn-out bee combs, or in the case of a comb honey producer, his comb honey crop. It is therefore most important to take adequate measures for the protection of these combs during the "off season" in districts where it is known that wax moth can be expected to cause trouble.

This is where methyl bromide fits into the picture, because pure methyl bromide is the best fumigant for comb honey and bee combs. At recommended rates and after thorough airing it leaves no taints or poisonous residues, and it has been approved by the Health Department for use with foodstuffs such as comb honey.

Methyl bromide is a lethal gas and must be handled with extreme care. It is supplied in steel pressure cylinders in a liquid form, but when released into the atmosphere at temperatures exceeding 9.4^{o}C it changes into an almost insoluble poisonous gas only slightly heavier than air. Indeed, its ability to disperse itself is so great that it will penetrate through wood, sheet cellulose, wax cappings and rubber. It is neither inflammable nor explosive and has no corrosive action on metals other than aluminium. However it is corrosive to metals when in the presence of a flame. (i.e. heating wires, pilot lights, etc.)

Pure methyl bromide is quite odourless, colourless, and tasteless. Its presence in the air cannot be detected without the aid of a "halide leak-detector" lamp. These lamps are specially constructed torches operating with fuels which normally burn in the air with an almost colourless flame.

However, a change in the colour of the flame to an intense green indicates a light concentration of methyl bromide in the atmosphere; and a change to an intense blue indicates a heavy concentration of methyl bromide. If using the "halide" lamp it is of course essential that the operator is not colour blind and checks should be made to establish this. Incidentally, one of these leak detectors costs about $13.00, which is negligible if it can save a life.

A respirator is also essential when handling methyl bromide in an enclosed building. These respirators, which cost $41.00 complete, have an approximate shelf life of 7 years, or a life of 2 years from time of fitting. The cannister will last for 1½ hours of continual use in low concentrations of methyl bromide, such as in the case of the fumigation of comb honey.

The Fumigation Regulations 1967 control the use of methyl bromide and are administered by the Department of Health. Commercial beekeepers are not required to be licenced operators as they derive their living from honey production. However, in the event of a serious accident or fatality taking place within the Industry through the mis-use of methyl bromide, it could well mean that these Regulations could be tightened up.

What are the symptoms of Poisoning? Though a strong dose of methyl bromide may kill a person instantly, a slight dose seldom produces any immediate effects, as symptoms usually appear slowly; even as late as 48 hours after exposure. The symptoms are dizziness, blurring of the vision, lassitude and a sensation of profound fatigue, staggering gait, abdominal pain, and convulsions. Any person developing such symptoms after exposure to methyl bromide should immediately call a doctor. The victim should be kept in fresh air, remain in a reclining position, and be comfortably warm.

The Ministry of Agriculture and Fisheries has produced a pamphlet on "Methyl Bromide for Honey Comb Fumigation". This pamphlet, which outlines the methods and precautions in using methyl bromide, is available through local Apiary Instructors.

THE BEE RESEARCH ASSOCIATION 25TH ANNIVERSARY LECTURE

"HONEY THROUGH THE AGES"

Mr Edward Roberts
Lecturer
Agronomy Department
Massey University

Mr Chairman, Ladies and Gentlemen

I am honoured to have been asked to deliver the 25th Anniversary Lecture of the Bee Research Association. I feel that this organisation is not as well known by New Zealand Beekeepers as it deserves to be. I would therefore like to devote a short time to bringing to your attention some of the functions of the B.R.A.

It is an international organisation set up 25 years ago in the United Kingdom and has a two-part role. In the first place it facilitates communication between scientists working in all fields related to bees and beekeeping in all countries of the world. In the second place it provides a central clearing house through which information can be channelled from the research workers to the users; that is the beekeeper and his advisory officers. The Association has members in most countries of the world and in each region there is a 'link man', who can feed information back to the Association from his region, and from the central body out to groups and individual members in his region. Our representative is Grahame Walton who I am sure would be pleased to discuss all aspects of the B.R.A. with anyone interested.

The B.R.A. publishes 3 Journals.

Bee World: a popular type of journal containing articles of a general interest nature.

Journal of Apicultural Research: a more scientifically orientated publication which provides a channel for reporting the results of research work.

Apicultural Abstracts: A journal which reviews briefly in English, all papers published in any language, which have any relevance to bees or beekeeping. This information is also indexed and is now stored in a computer, so that it is possible for any member wishing to obtain a review of papers on a particular topic to obtain a computer print out listing all the relevant literature.

From time to time the Association also publishes books, charts and bulletins on various topics. It also maintains a very large reference library and museum in the U.K. and members may borrow books by post in the same way as the N.B.A. library operates here in New Zealand. The Association also promotes conferences on topics of interest and importance to the industry.

It is my opinion that during the past twenty-five years the Bee Research Association - under the capable direction of Dr Eva Crane - has achieved, to a considerable degree, the high objectives set at its foundation. Research workers cannot function effectively in isolation, and the Association has greatly facilitated communication in this area. Research is of little value unless the results achieved are widely known; again the Association has achieved some considerable success in this field. The Association has therefore, by oiling the wheels of communication, enabled considerable progress to be made in our industry.

I am sure that it is the wish of all of us that the Bee Research Association should continue to function as effectively during the next twenty five years, and I would ask each of you to consider fully the benefits to be gained from membership.

In choosing the topic for this lecture I was conscious that we would all be gathered here discussing in fair detail certain aspects of the production, processing and marketing of our product - honey. The problems we have in these areas, seem at times to be so great that in my view we fail to see past them. I feel therefore that it might be valuable to stand back for a few minutes and look at our product on the broad canvas of history - hence my title "Honey Through the Ages."

Without a doubt the honey bee has been exploited for its honey since the dawn of civilisation. The earliest record we have of this exploitation is a painting on the wall of a cave near Valencia in Spain, which depicts a woman collecting honeycomb from a hole in a cliff. Throughout history from these earliest beginnings to the present day honey has featured prominently in the records and mythology of many civilisations. It has featured as a food; as a source of alcoholic beverages; as a medicine; as a preservative; as a cosmetic (which may or may not be considered a special case of preserving); as a part of religious ritual; and as a means of increasing sexual prowess. To do justice to this topic would demand hours of discourse and you are fortunate that I am strictly limited to half an hour! I shall therefore touch but briefly on some of these uses.

Honey as a Food

Despite a complete lack of knowledge of the chemical composition of honey and being completely unconcerned by such things as the Codex Alimentarius, man from earliest time to the present has regarded honey highly as a foodstuff. In fact in many languages the adjective "sweet" is derived from the word for honey. For example in my own native tongue (Welsh) the word for honey is 'mel', and for sweet is melys. We are conditioned today to think of sugar as the main sweetening agent in our civilisation. This is but a very recent phenomenon in the history of man however.

Although the sugar cane was known and used by people in North India in the 4th Century B.C. it was not introduced in the west until much later. The Arabs brought cane to the Mediterranean region and by the ninth century it was cultivated in Egypt. It remained however a 'rare delicacy' in Europe until the development of the sugar estates of the Americas during the 17th and 18th centuries. And it was not until the 19th Century that it became an important dietary component of European civilisation. Until that time honey had reigned supreme as the universal sweetener. We may ponder the fact that today honey has acquired the image of being a 'rate delicacy' and sugar is the universal sweetener.

Neither product has changed in essence. All that has happened is a change in the cost and availability of the two commodities.

Throughout the ancient world the value of honey as an energy giving food was recognised and even today that image remains among tribes which do not have ready access to sugar.

During my stay in East Africa I made a study of beekeeping and the uses of honey among several tribal groups. One such group - the Bakiga people of S.W. Uganda deserve a special mention in this context.

Among these people polygamy is standard practice and the woman is primarily regarded as a chattel. She is valued as a producer of children and the cultivator of the land. When a new wife joins her husband's extended family she is under extreme social pressure to prove her value as an asset to the group. She therefore works extremely hard and eats very little thus demonstrating her worth to her husband. What he doesn't know is that his mother every evening leaves a pot of honey by the bed of his new wife to ensure that she is able to maintain her strength.

As we have heard this morning there is a considerable difference of opinion regarding the definition of honey, and it is proving difficult to establish a consensus on this point in current discussions on the Codex Alimentarius. It would appear that in the Soviet Union there is no requirement for the bees to have collected either nectar or honeydew directly from plants for the product to be labelled as honey. I refer to a book published by N. Yoirish in 1959, in which he describes the production of "Express Honey". Essentially the bees are fed sugar syrup ad lib and when it has been sealed - the combs are extracted in the normal way. The implications of this process with respect to the definition of honey are as obvious as the advantages to the beekeeper! Yoirish has taken the process a stage further, and by the addition of various substances to the syrup has produced a range of types including Multivitamin honey, Carrot honey, Haematogen honey, Milk honey, and even Ginseng honey! Is this what the future holds for honey as a sweet food?

Honey as a source of alcoholic beverages

Resourcefulness is one of man's chief attributes, and this resourcefulness has never been more fully utilised in any direction than in the production of alcohol with which he could gladden his heart. Honey has featured prominently from China through Asia, Africa, Europe, and Central America in this regard. Also, almost all languages have a special word for the beverage produced purely from honey. Our word Mead is derived from the Sanskit word Madhu. For many societies honey was, and still is, too valuable a commodity for the production of mead for general consumption, and in these circumstances it is used to fortify a brew started with a fermented cereal. In East Africa, beverages of this type would be the major end product of most of the honey crop. I have tried a number of concoctions of this type and they vary in quality enormously. They have one thing in common - the ability to ruin a sensitive palate! However they do provide nourishment and they achieve their prime function of inducing a rosy glow and a feeling of well-being - at least until the following morning!

In these societies where honey is at a premium the pure honeymead is reserved for special occasions such as feasts, holidays and weddings.

Medicinal uses of honey

From earliest recorded history honey has been valued for its medicinal properties.

It has been widely advocated as a "preventer of disease" or an agent of longevity. Hippocrates - the father of modern medicine considered honey as an essential constituent of his diet - and he reputedly lived to be 107 - surely a good advertisement for any doctor.

The religious book of the Muslim people - the Koran - devotes the whole of Chapter 16 to the bee - and includes the following reference. "There proceedeth from their bellies a liquor of various colour wherein is a medicine for men".

Indian mythology praised the medicinal value of honey. Greek and Roman scholars extolled its virtue and even today among societies not conditioned to the universal taking of pills - honey still forms a large part of folk medicine.

In 1959 N. Yoirish published a book entitled the "Curative Properties of Honey and Bee Venom". He has assembled in this work a large array of medical conditions which are reputed to respond favourably to treatment with honey. It would appear to me that most diseases have been treated at some time with honey and in most cases a measure of improvement has been reported.

One area where modern medicine has acknowledged the value of honey is as a dressing for wounds and burns. In several hospitals in the U.K. honey dressings have recently been reported to encourage the healing of pressure sores and similar lesions when other methods have failed.

Not only have human diseases been treated but in an old book of Remedies for Diseases of farm animals which I came across some time ago honey featured there prominently too, and I have even seen honey recommended for the treatment of wounds in plants!

Recently we have experienced a resurgence of interest in natural things - this has manifested itself in many ways - one of particular significance to us as honey producers is the trend towards Health Foods. While I do not believe that we should make claims which we cannot substantiate regarding the curative properties of honey, we can safely emphasise its 'natural food' qualities and take advantage of the growth in the health food industry.

Honey as a preservative

Honey was the major preservative for fruit prior to the rise of sugar and is still widely used in preference to sugar for this purpose. This use is however in decline as honey prices climb steadily away from sugar prices.

It is not only in the preservation of fruit however that honey was used in the past. As you will be aware the Egyptians were masters in the art of preserving people. However when faced with

the task of preserving infants, their standard procedures were modified, and the tiny corpse was placed in a suitable container which was then filled with - you have guessed? - honey. Several of these gruesome containers were discovered in Egypt during the last century and the honey was still recognizable as such - though I doubt whether Mr Colin Rope, our Honey Grader, would have rated it very highly. Perhaps this is one use for honey that is best not advertised!

Honey as a Cosmetic

A special case of preserving is undoubtedly that practised by the cosmetic industry.

This industry has flourished for as long as women have wished to prevent the ravages of time from leaving their marks. Even when the prevention fails then cosmetics continue to be important as agents of disguise - concealing the lines and blemishes. Cosmetics in ancient time also served to disguise natural bodily fragrances (or odours if you believe the advertisements). In the days before soap this was possibly of greater significance than today. The arts of the cosmetician reached heights in ancient Egypt that have never been equaled since - anywhere. This is not the time or place to discuss some of the finer points. Needless to say honey featured prominently in many preparations. One example I cannot resist. Have you ever considered how the Egyptian maiden achieved "A Ring of Fresh Breath Confidence". She could not rush down to the corner supermarket for Brand X toothpaste. No - but she carried with her a small container filled with balls of crystallized honey mixed with aromatics and fragrances. How much more exciting than a quick brush with brand X !!

Honey still features strongly in many countries as a constituent of face packs. I think many of you here today would be surprised if you knew how much of your honey ends up on your customers' faces rather than in their mouths.

Religious uses of honey

The value a society places on a commodity can be measured in part by that commodity's place in the religious rites and rituals of the society. Honey has featured prominently in the religious observances of many societies.

By 4,000 B.C. in Egypt beekeeping as opposed to honey hunting, was well established and the royal title of kings of the 1st Dynasty included the phrase 'King of the Bee land' (Lower Egypt) and the 'Reed Land' (Upper Egypt - now Sudan). Taxes were levied in honey in parts of the empire and one Pharoah - Ramases III - was praised in an ancient manuscript for having donated hundred of thousands of jars of honey to the temple. Priests anointed their lips with honey - doubtless to increase the flow of honeyed words - and all temples included in their budgets a considerable sum for the purchase of honey to be used in religious rituals.

In Babylon and Assyria new born children were fed milk and honey at a special ceremony - a practice which has since been repeated by many subsequent civilisations from Mexico to Asia.

In the Old Testament the Hebrews were specifically banned from making a burnt offering of honey - this was a pagan ritual but honey was permitted as an offering of first fruits. Honeyed apples are still eaten by Jews during New Year celebrations. The spies returning from the promised land reported it as a land flowing with milk and honey - high praise indeed.

The Greeks and Romans offered sacrifices of honey to many Gods including Pluto - God of the Underworld - and "The Fates" who supposedly shaped human destiny. Doubtless the aim here was to sweeten the temperament of these important deities.

In India again religious offerings were made in honey, and many rituals and prayers of the Hindus mention honey.

Many civilisations practiced the offering of honey as part of funeral ceremonies and it was a common practice of many civilisations to place an offering of honey beside the corpse during the burial ceremony, some even buried their dead in honey. Achilles (of the famous heel) was reputedly interred in this manner.

Honey and Love

Honey has played an enormous part in the love life of many civilisations. The Roman Goddess Aphrodite was associated with honey as was Amor - the god of love. This god indeed was reputed to dip his arrows in honey to ensure the love he induced was sweet.

In marriage ceremonies in Scandinavia and Central Europe honey played a large part - in some cases to the extent where the bridegroom was covered in honey, and gifts of honey were frequently made to the happy couple. It is from these rituals that our much impoverished honeymoon is derived. However it is to India that we must turn for the fullest use of honey in this regard. The Indian god of love Kama is associated with honey and as might be expected the marriage ceremony of ancient India literally dripped with honey.

Long before Freud and his followers popularised their theories in the West, whole civilisations from the Mediterranean to India believed that a successful sex life was essential to a happy existence. A whole mythology surrounds their methods of achieving this happiness. Some of these writings have been made available to us in translations - perhaps the best known work of this type is the Kama Sutra - which was written as a guide book to achieving happiness.

Much less well known than these writings, are the formulae for very many concoctions designed to increase ones' prowess as a lover. By this stage I need hardly add that honey was a vital ingredient in many of these too, both those designed for internal consumption and those designed for external application.

In the interests of delicacy I will not pursue this fascinating topic further today, but will recommend it as a rewarding field of research to those of you who have an academic disposition.

On this thought provoking note I must conclude this lecture. I hope that perhaps these remarks might stimulate some of you to explore further some of the more exotic uses to which our product has been put.

At the present time much emphasis is placed on market diversification. Perhaps it is time that we re-explored some of these alternative uses for our product - HONEY.

Thank you.

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HONEY HOUSE HYGIENE AND THE HEALTH DEPARTMENT

Mr C.L. Barber
Supervising Inspector
of Health
Health Department
Rotorua.

First of all I want to say how much I appreciate the opportunity of participating in your Seminar. I have been asked to give a talk covering the main points on hygiene in the honeyhouse, the scope of the regulations in force and the responsibility of beekeepers towards these regulations; also a brief mention of the functions of Health Department "Inspectors of Health" and Local Authority "Health Inspectors" in this field.

You are in the business of producing a highly delectable natural food which deserves the same high standard of care at all stages in the processing and packing of honey as you would want and expect from producers of other manufactured foods on which you are dependent for daily sustanance. It is not enough that your finished product be visually clean, but that it be properly handled and protected against outside contamination right through from the hive to the honey jar.

The production of honey and for that matter any type of food for sale, places many legal responsibilities on all involved - both management and food worker alike - aimed at preserving proper and precise standards of food hygiene. These responsibilities are enforceable by law under two sets of regulations, both of which are up-to-date, having recently been revised. These are -

(a) The Food and Drug Regulations 1973 currently in force. These will be touched on briefly by another speaker on Thursday.
(b) The Food Hygiene Regulations 1974 which become operative on 1 January 1975.

There is every possibility that honeyhouses may be subject to annual registration by Local Authorities, after in most cases receiving the prior approval of the Medical Officer of Health. The precise point

in time at which registration will be obligatory is not yet clear, but in any case will not be enforced before 1 January 1976 by reason of the transitional period of 12 months provided for in the Regulations. Meanwhile I think apiarists would be well advised to inform themselves as to how the Regulations may affect them as individuals by obtaining a copy for themselves, by name The Food Hygiene Regulations 1974, which should now be available from your own Local Authority. Advice on a specific point can be obtained by an approach to your Local Authority Health Inspector or Inspector of the Department of Health in your area. You are encouraged to particularly study Regulations 9 to 21 and 82 to 86 which apply to all honeyhouses as "Food Premises" whether subject to registration or not. Hygiene and Honeyhouse may be covered under three headings (1) Premises, (2) Plant, (3) Personnel.

Premises

If the honeyhouse itself is of a good structual standard and is capable of being easily maintained in a clean condition, there is every likelihood that the standard of hygiene in that honeyhouse will also be good. This is where the use of modern materials for walls, floors and ceilings come in. On the other hand, where premises are unsuited for the purpose one very often sees untidiness, dirt and a general air of depression and worse still a haphazard attitude towards hygienic food handling.

The floor is perhaps the most important item deserving thorough consideration. I am pleased to see specific time allocated in the programme to this aspect. The essential features of a good processing floor include the use of impervious materials that are easily cleansed, resistant to wear and corrosion, adequately drained with the angle between walls and floors covered or rounded off. Wooden floors with boards laid on a firm foundation that are tightly clamped together are permissible, but could be considerably improved if covered by a commercial grade polyvinyl that is smooth yet not slippery with joints that are capable of being welded together and the material itself fixed to the floor with a suitable adhesive. This type of floor is more-or-less permanent, but in any case is easily repaired if any places become worn.

For wall to ceiling linings the recommendation is the use of a board with a hard glazed surface that will be permanent and maintenance free and certainly easy to clean. Materials that are dust proof, smooth, even and non-absorbent are the minimum requirements however.

The honey extraction and packing rooms are areas where the provision of adequate lighting is important. The illumination whether by artificial or natural means or preferably both, should be arranged as to light up all parts of the room particularly corners where dirt may accumulate. An illumination intensity is prescribed in The Food Hygiene Regulations and any Health Inspector would have available a light meter to assist you with this problem if required.

The screening of windows and door openings to exclude insects is essential to stop the problem of bees inside the honeyhouse. This should be resolutely faced up to and not discarded as inevitable.

The planning of the layout of a honeyhouse is of paramount importance, in which sufficient space should be allocated to each particular function to enable every person working there to do his work efficiently and just as important to allow space for proper cleaning. A place where cleaning is difficult is always a place where cleaning is not done properly. The separation of different reduction activities is always a good idea and for this reason in my view the larger honeyhouse could well be divided up into at least two rooms, one for honey extraction or the housing of storage tanks and for container washing, and a second for packing and labelling.

The provision of wash hand basins complete with hot and cold running water is a must in every food manufacturing establishment including honey production. These facilities should be installed as near as may be practicable to the parts of the premises where workers for whose use it is intended will be engaged whenever they are handling food. While the honeyhouse is in operation there is a mandatory requirement to keep wash hand basins clean and also to provide a nail brush and a good supply of detergent, clean towels or paper towels etc.

Plant:

Simplicity of design is the first principle with as previously mentioned adequate space around all equipment for easier cleaning. Equipment that is light and capable of mobility is a distinct advantage in this respect over the fixed type. Where tanks, containers and extraction units are fixed these should be installed on legs with sufficient space underneath to permit cleaning of the floor. The extraction equipment in honeyhouses visited were seen to be of various designs and materials. This equipment, particularly in small honeyhouses, are generally old and certainly difficult to clean. I think there is much room for improvement here. Tanks for holding honey manufactured years ago of tin steel and the like in which the inside surfaces of tin were worn off, should be scrapped and replaced with stainless steel, which is a much better proposition. Around this district I see numbers of perfectly good stainless steel milk tanks complete with lids, stored in a yard of a large dairy factory, apparently of no further use to the company or its milk suppliers and just begging to be re-installed in the small honeyhouse for holding honey either before or after straining. Good design of plant should reduce to a minimum the length of transfer pipeline required to convey honey from the extractor through its various stages to the final tank prior to packing. Pipelines should be seamless, in short lengths, with rounded elbows where changes in direction are required, both pipes and elbows complete with couplings for ease of dismantling when required for cleaning. My choice of material for conveying honey would be stainless steel, being both permanent and capable of being cleansed and sanitised properly. I am aware that some sections of your industry do not accept the requirement for daily cleaning of plant and equipment as carried out in other food manufacturing premises, but promote the concept of periodic cleaning by the use of cold water only without the use of detergents. This may well be an order and in compliance with Regulation 17 of The Food Hygiene Regulations 1974 which read inter alia "that all appliances, containers, receptacles shall be cleansed at such intervals as are necessary in order to keep them in a clean condition".

Personnel:

One has only to watch for a few minutes the food server, the waitress or bar tender to acknowledge the importance of the food handler in maintaining higher levels of hygienic standards. Expensive equipment of stainless steel and the like will not replace the need for knowledge in basic food hygiene techniques and in the practise of them. The evidence of the large number of complaints received by the Department of Health each year of foreign matter in food of which just on 1600 were investigated last year is just one example showing that food workers could do a better job than they are doing. In one honeyhouse visited I saw two large vats brimful of honey, waiting to be packed or in the holding stage allowing extraneous matter to settle out or to float to the surface. These vats should have had covers in place to prevent dust and oteer foreign matter from getting in. Other areas which we will not take time to cover in detail, include the need to wear clean clothing in the honeyhouse suitable to the tasks being carried out at the time and most of all the need for frequent and thorough hand washing while handling food, particularly after visiting the toilet.

Health Inspectors:

The future may bring you more and more into contact with Health Inspectors, so perhaps a word on this may clarify a situation which may be a little confusing to you. Briefly the position is this. There are two classes of inspectors, viz:

1. Inspectors of Health:

   These officers are employed by the Department of Health and having responsibilities under the Food and Drug Legislation will be visiting you at odd occasions to check on your honeyhouse hygiene in general, including packaging and labelling of honey. They also have powers of seizure and destruction of food under the same Legislation.

2. Local Authority Health Inspectors:

The main responsibility for securing acceptable standards of hygiene in the food manufacturing premises, including possibly honeyhouses in the future are in the hands of Health Inspectors employed by Territorial Local Authorities. These Inspectors have plenty of experience and know-how since as a group they deal with thousands of food premises of various categories and types a year. They will also be well informed on matters relating to hygiene in honeyhouses by the time they visit you and will have an understanding of individual problems. In any case, all will be encouraged to work in with and seek the co-operation of apiary instructors in the same way as they are already doing with other field officers of Ministry of Agriculture and Fisheries.

If you are in any way dissatisfied with any requirement of a Local Authority Health Inspector please remember Regulation 84 of the Food Hygiene Regulations 1974, which provides for an appeal to the Medical Officer of Health of the district in which you reside who may confirm, reverse or modify any decision or requirement. Remember however that any appeal must be made in writing within 14 days of any requirement of an Inspector. If you are not happy, exercise this right by all means.

UTILIZING OUR BUSH HONEY AREAS

A session in which THREE speakers were asked to comment on current development, potential and problems in utilizing our bush honey areas.

SPEAKER No.1

Mr Robin L. Jansen
Acacia Bay Apiaries Ltd.
Taupo.

Introduction

This source still offers a large potential for increased production, but I believe a certain amount of specialising needs to be carried out by the beekeeper in the fields of production and marketing to make the most of this attractive source of honey.

I will deal with production as it affects my company and then tell you something of my experience in the marketing of bush honey.

Management

To utilize the bush honey potential my company engages in extensive migratory beekeeping with approximately 5000-6000 hive unit shifts per year. Hives to be moved are loaded on a truck without being blocked or the using of screens. The bees are contained by the use of heavy scrim which allows most of the shifting to be done in daylight hours. The hives are held on the truck by tightly stressed synthetic ropes. Recently we had the unfortunate experience of capsizing a truck loaded with 170 hives. All the hives remained tied to the truck, thereby minimising the damage. Compensation for hive damage was agreed at $975.00. Incidentally this damage was fully covered by insurance - which I strongly advocate when moving hives.

Big crops of bush honey can be gathered by shifting hives from low altitude bush country to high altitude country. An experiment carried out by my company last year which entailed shifting 150 hives onto four consecutive flows, produced in excess of 16 tons per 100 hives. These 150 hives produced at least 24 tons which, based on 27 cents, grossed over $15,000.

Many bush areas lack any build-up sources and consequently hives must be moved in at the commencement of the main flows (bush). The hives should be moved out as soon as the bush flow is over to enable further production on pasture country. Hives left in the bush are subject to ravages by wasps, which can decimate an apiary in very short order.

A further value of bush honey production is that it is complementary to clover production in that it comes before the main clover flow and ensures hives of maximum strength. It also provides a valuable source of winter feed supplies.

Marketing

Good marketing is absolutely essential if a beekeeper is to exploit bush honey production successfully. It makes little sense in producing large quantities of bush honey if your prospects of a fair price for your product are to be jeopardised by the traditional attitude prevailing with our industry's leaders that dark honey is a problem honey and is somewhat less than equal both in value and public acceptability.

Production costs of this honey are similar to that for clover, and, therefore, to develop this source to its potential it is imperative to organise a market outlet which will ensure returns equal to that of clover realizations.

I began packing bush honey in selected source packs in the late 1960's owing to uneconomic returns being received from packers and the Honey Marketing Authority, alike. I believe it is wrong to sell these darker honeys at lower prices as is traditional among our major packers - to me a lower price suggests a poorer product. This is not the case.

I introduced my selected bush packs, comprised mainly of kamahi, tawari and rewarewa at the same selling price as clover, and now the sales of these lines have virtually taken over from clover sales. Details must be carefully watched with these packs or your dark honey sales will never get off the ground. It is essential to pack a quality pack well strained, with a fine grain and consistent with the name of the source. I have proved

that virtually any honey well packed and labelled according to the source will find its own market at the top of market realisations.

Conclusion

In conclusion I would like to make the following observations:

1. We must re-evaluate our attitudes to the marketing and production of bush honeys.
2. Each selected source can, and should, be presented as a prestige product in its own right.
3. Can we expect a potential customer to have any confidence in a product when confidence is clearly lacking within the industry itself ???

Our Honey Marketing Authority took a lead in this field some years ago when it packed selected sources and, I believe, this has largely been responsible for the increased interest in bush honey. Unfortunately these packs have been packaged in a manner which has made them too expensive, and consequently not enough is reaching the consumer.

I believe the ball is in the Authority's court for it to promote and sell selected bush honey packs whilst they have the opportunity, otherwise I am certain we will see Co-operatives formed to carry out this function.

I am confident there is a future for bush honey production. Let us develop our unique bush honey sources to the full.

UTILIZING OUR BUSH HONEY AREAS

SPEAKER No.2

Mr J.E. (Bill) Rodie
Apiary Instructor
Palmerston North

In the past few years the New Zealand consumer has shown considerable interest in the darker and stronger flavoured honeys. Attractively presented floral source packs have stimulated this interest. The retail price received for this type of honey compares favourably with, and in some cases exceeds,the price for clover and other pasture sources. It can be said that honey derived from bush sources has at last found its place in the marketing set-up.

The future looks promising for those bush honey producer-packers who have established, or are extending their retail outlets. Guaranteed high prices are less certain for those producers who sell their bush honey in bulk to the Honey Marketing Authority or to private packers. It would be true to say that the price for honey in New Zealand is determined greatly by the international market. Based on this world market the H.M.A. has emphasised lightness of colour and mildness of flavour as its premium honey preferences. A producer without retail outlets for his darker stronger flavoured honey needs to keep well aware of the marketing situation. A fall off in international prices or a change in marketing patterns could make a profitable crop at the present time an uneconomic one in the future.

Despite the higher honey yields usually obtained from the darker honey sources beekeepers in the past have been reluctant to depart from the traditional higher priced, but lighter yielding, pasture-land honeys. If you have good hives and you are capable of shifting them easily and efficiently may I suggest to you that it may be more profitable to shift your hives than leave them permanently on a pasture-land site. Now I am not recommending that you abandon your pasture sources in favour of the bush, but rather I am suggesting you take the best of both worlds.

In economic terms,it costs less per pound (or kilogram) of honey to produce a larger crop of honey than it does a smaller crop. The more honey you produce the more efficiently you are utilizing your standing charges - capital equipment,rent, rates, insurances etc. The greater the yield the greater the proportion of profit. In shifting hives to a second honey source, say a bush honey source, it is only the variable costs, e.g. mileage, time, extra labour, accommodation, that are added. Although bush honey may be cheaper per pound than the clover-types even small yields of this honey may convert a marginally economic enterprise into a profitable venture.

Our bush honey areas have other benefits. They can be used to aid colony build-up to good advantage. They can significantly reduce the cost of colony feeding.

In my Palmerston North apiary registration district certain areas can and do produce bush crops which are worth exploiting. One in particular is the Egmont National Park. In this Park are hundreds of hectares of kamaki, and in a lesser vein rewarewa. Access is excellent around the National Park and it is completely surrounded by pasture land. So here is a favourable balance. Apiaries placed on the borders of the Park are in a favourable position to gather two crops a year. The rewarewa yields prior to the clover flow and the kamaki overlaps with the early stages of the clover flow. It is rare to see the failure of both sources. In the Whangamomona and Puniwhakau areas pasture sources hardly bear mentioning but surplus bush flows can be gathered, together with the prolific manuka. In the Ngutawera, Waitotara and Kai Iwi areas bush honey can be produced, and manuka as well.

The Pipiriki area bordering on the upper reaches of the Wanganui River gives a very promising picture as far as recognised beekeeping practices go. Here we have the only migrationary beekeeping carried out in the district. Each season hundreds of hives are moved into the upper reaches of the Wanganui River to gather nectar from bush sources, and when the flow is just terminating these hives are moved out and back to base to be placed

on sites on pasture lands. With two crops harvested in favourable seasons this bush honey gives extractable returns similar to the Egmont National Park area, although a greater variety of bush sources are to hand.

I believe there is considerable potential for increased production in all of these areas mentioned. And extending this further, I believe there are many profitable bush areas in New Zealand presently untapped or insufficiently utilized by beekeepers. Of course there are problems - problems of mobility, access,sites, flooding - but I think you may be surprised how many good areas are overlooked on your doorstep.

BUSH HONEY PRODUCTION IN THE SOUTH ISLAND

SPEAKER NO.3

Mr Murray Reid
Apicultural Advisory Officer
Christchurch.

In the South Island the only bush areas traditionally worked for marketable honey are the West Coast areas where kamahi and rata are the main honey types produced. In recent years Canterbury and Otago beekeepers have been moving large numbers of hives to the Coast not only for early build up but also to obtain extractable honey.

In Southland, bush areas are worked mainly for fuschia and kamahi with some kanuka and fivefinger. The bees are moved in during the spring to build up and are brought out again in December for the clover flows. Bees do not winter well on bush sites and the risk of disease is very prevalent. A huge area around Lake Te Anau could support an additional 3,000 hives. This area is covered in rejuvenating manuka, Hebe spp., and other bush sources and it is being oversown with clover. Strong hives have collected a super of light coloured and delicate flavoured manuka, one of Hebe and two of clover/catsear, etc.

Pockets of bush sources are exploited by beekeepers in the Nelson area either for spring build-up, winter stores or section and cut comb honey production. Some 400 hives are moved into the Marlborough Sounds each winter by jet barge for the heather and manuka.

Perhaps the bush areas most exploited by South Island beekeepers are the beech honeydew areas that stretch between Kaikoura in the north and Mt Somers in the south. Again, beech honeydew was only used as a source of winter feed until 4-5 years ago when overseas markets for extracted honeydew were developed. The beech forests cover some 225 000 hectares (550,000 acres) of which half could be in honeydew producing areas. It is impossible to accurately estimate

the production potential from honeydew forests because a considerable quantity is used solely for feed and other areas are not exploited to their fullest extent. Probably the most limiting factor, not considering the vagaries of the weather, is the limited access to the forest areas and the difficulty of obtaining new apiary sites. However, the forestry personnel are most co-operative in making sites available to beekeepers. A potential production of 500 tonnes would not be unreasonable.

South Island beekeepers will continue to make increased use of bush honey areas provided the risk of disease is not too great. Shifting hives to the bush is becoming more attractive as production from the clover lands decrease, droughts persist and feeding back sugar becomes less economic. Some beekeepers have switched their total operations over to the production of honeydew.

HANDLING MANUKA HONEY

SPEAKER No.1

Mr Peter Pegram
Frazertown
Northern Hawkes Bay

In discussing manuka honey, its handling and its processing problems, I should point out that our New Zealand Honey Grader has expressed the comment that the type of manuka that I produce is the thickest and most thixotropic he has seen. The methods used elsewhere for handling this type of honey do not seem to work for me.

The area I operate is 80 miles north of Napier, 70 miles south of Gisborne, in the northern Hawkes Bay. It is a thick manuka honey area except for some dairy flats and rolling pumice country areas. The whole of the Wairoa County and East Coast is much the same. My theory for the heaviness of the honey is partially climatic but mainly soil type.

I have found it hard to predict if a frame will extract or not. A frame that looks like clover on the surface could have a significant amount of manuka in the base of the cells, preventing its extraction. Compared to other honey flows in the district, manuka extends over a long period. I believe it true that bees prefer manuka to other sources and are all too willing to fly over paddocks of clover. I have known seasons where not one comb will extract conventionally. It is enough to send you up the wall!

Over the years I have tried most of the methods for extracting manuka honey. Many of the recognised methods work somewhat, but fall down when bigger through-puts are required. Wax pressing is too slow, and messy, for commercial enterprises. Many of you use prickers for breaking the surface tension in the honey cells, but unless you have room to position two or three of them and men to work them, your output would be low. I have found the pricking machine satisfactory for some seasons but in others it is too slow and causes damage to the frames. A hot-room at various temperatures did not help. The problem was in the type of honey itself.

My method now is to scrape the frames down to the foundation using a modified type of Rosedale plane used on the back edge. Output per day is limited to the number of boxes that can be scraped and the number of boxes per ton of honey. If I scrape 60-70 boxes a day I am reasonably happy.

My whole business is a two-man operation. My wife is the other man! She scrapes the wax off the top bar, grades the frames and feeds them into an uncapping machine. Combs that are not manuka are put to the side for a separate run.

The Rosedale plane must be well supplied with steam so that the plane clears itself between the finish of one stroke and the start of the next. Hot combs cannot be scraped. The wax must be at air temperature and brittle. The frames are then put in a 21-frame semi-radial extractor to dry-off the honey on the comb and frame woodwork. The cappings wax, side-wall wax and the bulk of honey is handled, in our set-up, by a whirl-dry (or spin-dry) machine. It has many advantages over pressing and hot-top rendering. We use an adapted 4-frame extractor shell with 4 segment baskets fitted into it. Each basket can hold about 2 hours of cappings. They are dry enough to be just tipped out. This separates most of the honey from wax. Although our two whirl-drys do not perform a continuous process they are easy to operate. The gauze I use is quite fine - 3/16 inch, which means that I do not fill the machines over-much, and I operate them frequently. It is a good pre-straining system. The wax from the whirl-dry is dumped into a jacked half ton tank and then melted down with a steam coil.

To spin dry and to strain honey it must be warm. I have a hot sloping tray under the uncapper and then it is further warmed in a holding tank to 27-30^{o}C (85-90^{o}F), suitable for the spin-dry.

Honey from the spin-dry and extractor pass through a baffle-jacked water heater then to a circular strainer. It is of 30-mesh stainless steel and requires frequent turning to permit effective straining. The problem I am faced with at the moment is the proper heating and straining as a result of surges of honey through the spin-dry, and I am working on improvements to this area.

Another problem is the melting of some wax into fine spherical globules that pass through most of the strainers.

My description may give you the impression of a "mickey mouse" outfit, and perhaps you are right. I am far from satisfied with it. On the basis of extracting 1-1½ tons of manuka honey a day I am sure it would be an easy 2 tons plus a day if I could get clover honey.

I hope I haven't frightened you away from bulk manuka production. Although it has its problems with extraction there is considerable potential for it. Let us hope technology will make it easier for us than it is today.

HANDLING MANUKA HONEY

SPEAKER No.2

Mr Malcolm D. Haines
Haines Apiaries
Kaitaia
Northland.

In our 1,700-hive enterprise in the north of the North Island we have many types of manuka. In the far north we have a very light bodied manuka. In the more mountainous areas, over 600 feet, we have the heavier bodied honey somewhat akin to that of Mr Pegram's area. We also have kanuka, with similar properties to manuka. In fact when extracting kanuka it comes out of the cells in pellets and tumbles down the side of the extractor.

We have found that manuka will extract better from foundation than from brood or aged honey combs. We sometimes use the strip comb method, which is no more than a wax strip placed in an empty frame. Full combs are then cut out.

Our honey-house machinery is designed to handle all types of honey. We can handle 2-3 tons in an 8-8½ hour day - from walk-in to walk-out. We find a hot-room essential, although we endeavour to remove honey from the hives as early as possible. Our hot-room can hold 400 supers at 32-35°C (90-95°F). Honey is thoroughly heated to this temperature. We use a 4 kilowatt under-floor heat as well as 3-kilowatt fan heaters above.

Our mechanical uncapper cuts as deep as we can - at least to the frame wood. The cappings are broken up and transferred to a whirl-dry. This is a 50-frame radial extractor converted to contain a stainless steel screen and a stainless steel cone on the bottom. The cappings are spun slowly at first, stopped, further broken up, then spun again. Our cappings wax in the end contains only 2-5% honey - far better than pressing. With manuka, hot-tops are no good other than for making excellent toffee.

We do not use a pricking machine to aid with the extraction. The hot-room is sufficient to move the honey from the comb. Our 3 extractors are 8-frame Pender types. For heavy bodied honey we have found that extractors must be fully reversible - semi radials

just do not work. They travel at 350-400 revolutions per minute and care must be exercised in speeding-up and reversing. The baskets in the extractor are made of wire, and not gauze.

No other heat is used other than in the hot-room. The honey runs freely although a jelly sometimes forms in the extractor which is removed at the end of the day. We use a circular strainer with 60-mesh gauze. They should be turned often and not left to become overloaded with granulated honey, wax or debris. One of these circular strainers can handle 2-3 tons of manuka honey a day without any problem, and it is a dream for clover honey. The circular strainer must be well constructed and should be mounted on rollers. We are planning to build into the circular strainer a re-cycler to overcome clogging. In the whole operation we find that it is the strainer that is the bottleneck for manuka honey.

Many people are turned off the production of darker honeys - and thixotropic manuka honey in particular. Others regard it only as a feed source. In my opinon it is one of the easiest honeys to market because of its high public demand. This demand is increasing. At the same time New Zealand's darker honey areas are becoming less and less, and heightening the demand.

HANDLING MANUKA AND LING HEATHER HONEYS

SPEAKER No.3

Mr Grahame M. Walton
Apicultural Advisory Officer
Palmerston North.

The problems associated with manuka (Leptospermum spp.) honey outlined by the two previous speakers are also shared by another honey - ling heather (Calluna vulgaris).

Ling heather is a relative newcomer to New Zealand. This European scrub plant was introduced to the Tongariro National Park area of the North Island ostensibly to provide a ground cover for the grouse game-bird. However the rapidly spreading ling heather proved more attractive to the bees than to the establishment of grouse. Beekeepers capitalized on this late season nectar source and reasonable honey yields have resulted.

Ling heather and manuka honeys possess similar properties of thixotropy and elastic recoil making their extraction and straining a difficult process. Both types of honey form a jelly-like condition, called a gel, in the honey comb. A gel state may also occur with time in the extractor, honey pipes, tanks and at other points along the processing line. Ling heather has in fact been known to retain its full hexagonal shape after careful removal from the cell of a honey-comb.

The cause of thixotropy in ling heather and manuka honeys is not known. It is believed that large amounts of colloidal matter, and particularly proteins, is a contributing factor. In comparison to other types of honey, ling heather has high ash content and pH values. However this does not hold for manuka honey.

The jelly-like properties of heather and manuka honeys can cause serious problems in their processing. Bubbles of air are often held in suspension and are difficult to remove. The air bubbles are unable to ascend through the gel. A beekeeper's best approach to this problem is one of prevention rather than one of cure. He should ensure that air bubbles are not incorporated with the manuka or ling heather honeys. Honey should not be poured,

dropped or dripped from one receptacle to another. For instance, the entrance pipe for honey running into a sump or baffle tank should be below the level of honey in the sump tank. The position, speed and type of honey-pump is also important. A sliding-vane pump is preferable to a gear pump; the latter tends to mince wax flakes into finer particles which are themselves held in suspension.

Heating to excessive temperatures can quickly damage ling and manuka honeys. Temperatures above 65°C (150°F) cause the precipitation of the protein portion of honey. This alters the character and flavour of honey. Thixotropic honey from a cappings melter is also highly likely to be impaired. Wax melts near to this critical 65°C temperature. Portions of wax and its pigments may become embodied in the precipitated protein.

The two previous speakers in this session have mentioned the types of equipment which they have found best in handling and processing manuka honey. This same equipment would be satisfactory for ling heather honey. A few other thoughts on the handling of thixotropic honeys are worthy of mentioning.

Honey frames are subjected to considerable stresses when extracting manuka and ling heather honeys. They should be stoutly constructed. If Hoffmann frames are used 4-wired foundation is better than 3-wired foundation. White combs are easier to extract and produce a better quality product than brood combs. Consideration should be given to the Manley frame which is specially designed for honey production.

A "hot" room to warm the supers of honey before extraction is desirable. It should be thermostatically controlled so that the temperature is no greater than 35°C (95°F). Air circulation in the hot room is an advantage. Although the warming of honey does not reduce the jelly-like consistency of pure ling heather and manuka honeys it aids in the extraction process once each cell of honey has been "pricked".

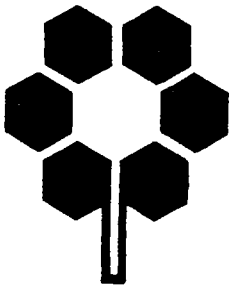
Over the years New Zealand beekeepers have developed various types of pricker systems to break down the thixotropic gel state; from simple hand operated pads to semi-automatic machines.

However these prickers have proved to be too slow for the requirements of today's medium to large businesses, beekeepers preferring to either crush the comb or to produce cut comb or section comb honey. A European company (Thomas Ltd., of Orleans, France) manufactures an automatic pricking machine which has commercial possibilities in New Zealand. A battery of needles enters each comb cell 8 times, two frames at a time.

The radial extractor is ineffective in extracting manuka and ling heather honeys. The semi-radial and tangential extractors are better, but even then care must be exercised in reversing them, least the weight of unextracted honey should break the combs.

The cylindrical wire strainer has been discussed as an effective strainer of honey. The rotary filter is another French-made alternative, but at present it is not in use in New Zealand. The rotary filter works on the same principle as the whirl-dry except that the spinning tub is lined with a nylon mesh bag to trap the fine particles of wax.

One item of equipment that could have considerable potential in New Zealand is the (Cook and Beal's) honey-wax separator. This machine, which will be on display at the field-day tomorrow, separates the wax from the honey in a continuous process. The Ministry of Agriculture and Fisheries plans to test the effectiveness of the honey-wax separator in its processing of thixotropic honeys. Its success has already been noted overseas. A commercial beekeeper in Scotland (Mr A.M. Kirkwood of Blairgowrie) uses the honey-wax separator in combination with a New Zealand automatic uncapping machine and the French pricking machine described above for the processing of ling heather honey. The honey leaves the separator free of any wax and is then pumped direct to the storage tanks.



ACACIA BAY APIARIES LIMITED

FIELD DAY

The second day of the Seminar programme was devoted to a field-day at two of New Zealand's leading honey-houses; Acacia Bay Apiaries at Taupo, and Arataki Honey Ltd. at Waiotapu.

Acacia Bay Apiaries operates 2,400 hives in the Kawerau, Rotorua, Taupo and the Tongariro National Park districts. Major sources are clover, kamahi, tawari, rewarewa and ling heather.

The Company employees three full-time as well as seasonal staff. With the aid of three trucks 5,000 to 6,000 hive-shifts may be undertaken in any one year. Some hives are shifted four times.

The present 3000 square metre (3,300 square feet) honey-house has been in operation for one full season. The building was formerly a roading contractor's depot but now, as a result of careful planning and re-designing, a modern efficient honey-house is nearing full completion. Further improvements and up-grading of the hot-room, loading bay and storage room facilities are planned.

The 67 square metre (720 square feet) extraction room meets the highest of hygiene standards. Floors are of high density vinyl (Polyflor) laid over the top of chipboard. The flooring edges are curved into the laminex-lined walls. The ceiling is also of laminex.

The honey-house's uncapping, extraction, pumping and wax separation equipment are all mounted from a central steel support. Power is supplied through the ceiling. Equipment consists of a Penrose automatic uncapper and two 21-frame stainless steel Pender semi-radial extractors. The spinning rate of the extractors is governed from a control panel above the uncapper. Beneath the uncapping machine is a 2 inch Pender cappings pump which pumps the mashed-up cappings to a coiled heat exchanger. Extracted honey is also pumped through this honey-warming unit. Honey and wax leave the warming unit at 45^{o}C (113^{o}F) into the centre of a honey-wax separator.

The Cook and Beals' honey-wax separator, the first in the North Island, is a machine designed to continuously separate the wax from the honey. Operating on a principle similar to that of a milk separator, this machine has a capacity to handle over 10 tonnes of honey a day. The dry wax is removed in a continuous process by adjustable cutter blades.

After straining, honey is pumped to the adjacent packing room and into 2 - 2½ tonne stainless steel storage tanks. These tanks are temperature controlled; honey may be pumped either into the header tank ready for packing, or through a hose pipe with a control nozzle and into 300 kg (650 lb) drums. The 45 square metre (480 square feet) packing room is constructed of material similar to that of the extraction room.

An attractive honey shop adjacent to the packing room presents the customer with a wide range of floral source packs, in 250 gram, 1, 3, 5 and 14 lb containers. Over the last few years the Manager of Acacia Bay Apiaries, Mr Robin Jansen, has noticed a marked consumer swing to the darker, stronger flavoured honeys.

At the conclusion of the honey-house visit Mr D.A. Briscoe, on behalf of the 165 people attending, thanked Mr Jansen and his staff for hosting this visit, explaining and demonstrating the equipment, and for providing the facilities for the trade exhibits, equipment demonstrations, and the field-day luncheon.

ARATAKI HONEY LIMITED

FIELD-DAY REPORT (Contd.)

Waiotapu 56 kilometres (35 miles) north of Taupo, is the location of New Zealand's largest honey depot, and even then it represents only a portion of Arataki Honey Limited's total operations in the North Island. 9,000 hives are serviced from Arataki Honey's Waiotapu depot and from the storage facilities at Netherton, on the Hauraki Plains. The territory covered includes the Coromandel, Waikato, Bay of Plenty, Otorohanga, Rotorua, Taupo and Tongariro areas. Major sources of nectar are clover, thistle, rewarewa, kamahi, manuka and tawari.

In a full season over 10,000 hive movements are recorded. Some hives may be shifted as many as four times. Field staff are employed at a rate of 1 qualified man per 1,000 hives. Four heavy duty trucks operate out of Waiotapu.

The size of the honey-house is impressive. A 780 square metre (8,500 square foot) honey-house and storage shed has been built recently. This steel-framed concrete-floored building offers plenty of flexibility for existing operations, and for any future partitioning and extensions that may eventuate. Adjacent to this building is a 186 square metre (2,000 square foot) workshop. Honey-house operations are based on palletization. Trucks can be loaded and unloaded by fork-lift virtually anywhere within the honey-house. Plenty of room is allowed for vehicle movement and stacks are built up to 15 supers high.

Pallets, each containing 24 supers of honey, are placed on a hydraulically operated turntable at the extraction bay. Three girls perform the extraction process using the easily-operated equipment. This consists of a Davidson automatic uncapper and four 8-frame extractors. Cappings at the present time are crushed and pumped along with the extracted honey to one of four 30 tonne sarran-lined concrete tanks. It is eventually intended to handle the cappings using separate settling tanks, however the hot-water

heated 30-tonne tanks serve this function at present. The filling and emptying of these tanks is accomplished by a 2-inch (50.8 mm) gear pump, motor, assisted by a truck gear-box. Up to 600 pounds per square inch (4,000 kilonewtons per square metre) pressure may be generated in the pumping process. Honey can be pumped at the rate of 8 tonnes an hour.

Bulk honey is transferred in 7-tonne loads to Arataki Honey's Havelock North plant for further straining and for packing. The Waiotapu plant has a present capacity for 500 tonnes of honey.

Arataki Honey Ltd. have taken full advantage of the heating offered by geothermal steam on its doorstep. Geothermal steam is used for all processes normally requiring a boiler. Hot water piping is conducted under the floor of the 780 square metre (8,500 square foot) honey-house, and its heating effect can be controlled in different parts of the building. For instance the floor heating can act as a "hot-room" for incoming supers.

In escorting the Seminar group through his Company's Waiotapu depot, Mr Russell Berry demonstrated and explained many other items of interest. The method of sugar syrup feeding was particularly noteworthy. Sugar was mixed in large stainless-steel tanks and then pumped into three portable containers, holding in excess of six tonnes, on the truck deck. In the apiary the syrup was dispensed into hive feeders using a nozzle and hose system similar to that used at petrol pumps.

Arataki's section comb cleaner was also of interest. This machine, designed and built by Mr Russell Berry, has a capacity to clean the four sides and edges of sections at the rate of 1000 per hour.

On behalf of all Seminar participants Mr D.A. Briscoe, field-day coordinator, thanked Mr and Mrs Berry and the staff of Arataki Honey Ltd. for hosting this visit, explaining and demonstrating the equipment, and for providing an unexpected but thoroughly appreciated afternoon tea.

FIELD DAY DEMONSTRATIONS AND DISPLAYS

DEMONSTRATIONS

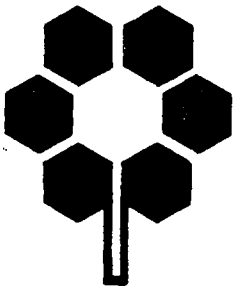
A number of items of equipment were demonstrated or displayed at the Seminar. These included:

- Manuka honey pricking machine (David West)
- syrup feeders (Cliff Bird and Dudley Lorimer)
- honey sump and warming unit (Ray Robinson)
- metric hive (Ministry of Agriculture and Fisheries)
- hive loader (Barry Hoskings)
- pneumatic hammer (Russell Poole)

TRADE DISPLAYS

The following Companies and individuals either established a display stand or their representative was in attendance at the field-day:

- Abbott Laboratories (N.Z.) Ltd. (Fumidil B. antibiotic)
- Alfa-laval N.Z. Ltd. (heat exchangers, filters etc.)
- Alliance Bee Supplies Co.Ltd.
- Auckland Tool and Gauge Co.Ltd. (plastic containers and other plastic products)
- Davidson Enterprises Co.Ltd. (uncapping equipment)
- John L. Guilfoyle (Sales) Pty.Ltd. Queensland, Australia (plastic excluders, bee equipment suppliers)
- D.F. Penrose (uncapping and cappings rendering equipment)
- D.L. Ward (hive handling equipment)



THE MARKETING OF HONEY

Mr Alan Ward
Reader
Department of Agricultural
Economics and Farm Management
Massey University.

MARKETING AND OTHER SUBJECTS

Let us accept that honey is the main product derived from bee-farming. This simple statement places the industry in the agricultural sector, where it belongs.

The production of honey faces the common problems of biologically orientated production. It also faces institutional problems common to the agricultural sector. The biological nature of farming implies a routine heavily dependent upon seasonal conditions. Our inability to predict future weather patterns thus injects a high degree of uncertainty into honey production. This instability in production can be gauged from the Twentieth Annual Report of the New Zealand Honey Marketing Authority (H.M.A.) for the year ended 31 August 1973 where a diagrammatic presentation of export sales made by the Authority over the last 10 years reveals an export of 227 tons in 1968/69 and 1996 tons in 1970/71.

As the H.M.A. is virtually the sole exporter of honey (with the exception of comb honey) and the estimated consumption of honey in New Zealand is constant, it follows that fluctuations in exports recorded by the H.M.A. represent seasonal changes in output, allowing for inventory changes. An uncertain and unpredictable output is a special feature of the honey industry and poses problems in the marketing field. Obviously, it is difficult to plan promotion and advertising campaigns when continuity of supply to an overseas market cannot be guaranteed.

Over the years, primary producers have sought and obtained collective security by the formation of statutory marketing authorities. These authorities have evolved as experience revealed that voluntary self-help co-operatives in the marketing field that attempted price regulation had a very poor survival rate.

The problem was simply that it was possible to enjoy the benefits of the marketing co-operative without subscribing to the cost of the organisation. Consequently, it was found necessary to make membership and subscription compulsory. This is the basis of operation for all our Marketing Boards and Authorities.

However, the functions of the various Boards differ widely. For example, the New Zealand Meat Board, despite being the first Board to be established in 1922, has until recently merely acted in a supervisory role. It has been responsible for negotiating shipping rates, establishing a grading system and assisting in promotion. It leaves the actual marketing to proprietary companies and does not exercise a trading function. The exception refers to the formation of the New Zealand Meat Export Development Company (DEVCO) which consists of New Zealand owned freezing works and the Board. DEVCO was established in 1962 and has exclusive rights to the North American lamb market. The Meat industry has recently been subjected to a Commission of Enquiry under the Chairmanship of Mr Arnold Nordmeyer and the Enquiry supported the principle of private enterprise trading under Board supervision.

The New Zealand Wool Board operates in a similar fashion, but it was intended that the Wool Marketing Corporation would take on a major trading role. However, producer resistance to compulsory acquisition has placed the Corporation in mothballs.

In contrast, the Dairy Board is the sole exporter of dairy products from New Zealand and owns marketing subsidiaries overseas. It has established brands and has responsibility for some products as far as the retail shop. The Dairy Board is not directly involved in the New Zealand market.

Perhaps the most complete functions are possessed by the Apple and Pear Board which markets all apples and pears both within New Zealand and overseas. It sells both fresh fruit and a number of processed lines, from juice to pie-filling, through to apple wine. Control on the local market is effected by making gate sales in excess of two bushels per customer illegal and the Board is normally required to make occasional prosecutions of growers and/or retailers

contravening the regulations. Finally, most horticultural products and many minor primary products possess no regulative body or authority, especially those products that are perishable and can be sold without processing.

The above review of some of the major Boards suggests that there is no single marketing organisation that is ideal.

The Honey Marketing Authority is unique in the sense that it operates both on the export and the local market, where the bulk of sales on the local market are made by private enterprise. This has posed problems of an effective levy system with perhaps 1500 tons of honey evading payment. It is also significant that the H.M.A., unlike most producer groups selling on the domestic market, have no powers of supply control. The Town Milk Authority for example, exercises control by means of quotas, the Poultry Board operates an Entitlement Scheme and the Hop Marketing Committee supervises contracts.

Mr Ian Clark, a Senior Agricultural Economist for the Commodities Section of the Economic Division of the Ministry of Agriculture and Fisheries, writing on "local marketing of Agricultural Products in Marketing in New Zealand" (Hicks, Smith & Son 1973) in the section dealing with the H.M.A., concludes as follows:

> "In general it can be said that the H.M.A. is neither particularly effective nor particularly ineffective in its local market operation, although it does contribute an element of stability to the industry".

Certainly the Caucus Inquiry into the New Zealand Honey Industry suggested rather sweeping changes in the functions of the Authority. However, in the continuing tradition of National Beekeepers' Association (N.B.A.) Conferences, these were flatly rejected.

What is the nature of this industry that consists of less than 100 full-time commercial bee-farmers that warrants a properly constituted statutory marketing authority and occupies a disproportionate amount of Ministerial time?

There are 200,000 hives owned by 3,559 beekeepers, but only 48 beekeepers own in excess of 1,000 hives which would provide an acceptable full-time income. At the other extreme, there are 3,169 beekeepers with less than 50 hives. These hives produce an unknown quantity of honey bravely estimated by the Ministry of Agriculture and Fisheries around 5,300 tons per year. The average payout over the past 10 years by the Honey Marketing Authority is 13 cents per lb. which gives a total honey-house return of $1.5 m. per year. Even at current retail prices the total value of output must be less than 5 million dollars. Since 1968/70 the pay-out has almost doubled and thanks to Mr Moyle (Minister of Agriculture) reserves total some $500,000. Despite this improvement in payout the industry's Association has teetered on the brink of insolvency in the recent past. The National Beekeepers' Association has had to accommodate subgroups such as the Packers' Association and the Comb Honey Producers' Association, whose aims and interests do not always coincide with those of the national body or those of the Honey Marketing Authority. Successful marketing is prejudiced under such conditions. It is my conviction that appeals for unity and loyalty are poor substitutes for removing the irritants in the system if that is possible.

In view of the size of the industry and the number of individuals actually engaged full-time in the industry, one obvious solution is to return to an unregulated market. This is essentially the system preferred by meat and wool producers - although both groups do operate a minimum price scheme. It is also the system that caters for fresh vegetables, possum skins, venison, comb honey, grass seed, race-horses and chinese gooseberries (kiwi-fruit) to mention but a few. Its main attraction would be that administrative overheads would be reduced to a minimum and the costly trading operation conducted by the H.M.A. would be unnecessary. Its major defect would be that if a really good honey year in New Zealand coincided with low export prices, there would be no protection from low incomes. However, it would remove the irritants from the system and beekeepers would be forced to direct their frustrations at the impersonal price mechanism rather than personalities occupying positions of responsibility within the H.M.A. and N.B.A.

In an industry where only 48 honey-producers own more than 1000 hives personalities must intrude.

At the other extreme the irritants could be overcome by making the H.M.A. responsible for the entire honey crop along the lines of the Apple & Pear Marketing Board. Private sales would be prohibited and private packers would be obliged to obtain their honey from the Authority. Beekeepers would receive an equalised pay-out which would be the same for all beekeepers.

There are obviously various possibilities between these two extremes, but the one untenable system is where private packers compete with the Authority on the domestic market, with the Authority having sole right of export. Here private packers regard the Authority as subsidised competition per medium of the seals levy. The Authority must compete for supplies, and hence suppliers to the Authority are more esteemed than suppliers who sell to private packers when prices are good, but use the Authority when prices are low.

The Authority is charged with improving the honey industry in general, not its own suppliers in particular. The Government Caucus Committee investigating the Honey industry discussed this issue at length and as their report was distributed to all beekeepers owning more than 30 hives, I assume that these arguments are appreciated.

My own preference is for the H.M.A. to adopt a Meat Board type role - namely, supervisory, with responsibility for market information and industry promotion. It would licence packers whose plant and equipment met acceptable standards and its stabilisation role would be performed by seeking tenders for honey in periods of low prices. Only licenced packers would be permitted to export and the Authority would administer minimum export grades and prices.

The present system has not and cannot work particularly well. Beekeepers insist on being rugged individualists and on changing their minds rather frequently - almost as frequently as General Managers of the Authority. Less than 100 beekeepers can be considered full-time commercial operators and yet the Ministry of

Agriculture and Fisheries provides two Apicultural Advisory Officers, nine Apiary Instructors, a Superintendent of Beekeeping, two research workers and supporting technicians, a Honey Grader and the Government representative on the H.M.A. This contribution is probably worth $200,000 per year. In addition, the N.B.A. absorbs $12,000. The H.M.A. owns three processing plants, all requiring a salaried manager. But of the total H.M.A. costs of $431,235 for 1972/73 year let us assume that $100,000 is incurred in assisting the industry in a general administrative sense. We come to the conclusion that in excess of $300,000 is required to administer an industry upon which only 100 beekeepers are totally dependent.

Market research and honey promotion are conspicuous by their absence. The smallest item listed in the income and expenditure account of the H.M.A. in 1972/73 is advertising at $8. A study conducted by Messrs Thirkell and Wilson - business students from Victoria University, Wellington, and entitled "Honey Marketing in the Wellington Area" (3 October 1973) - commented as follows :

> "The Honey Marketing Authority undertakes no promotion of its brands of honey and any promotion undertaken is devoted solely towards 'educational' purposes."

They also suggest "that it is more profitable for producers to fully market their own products or to sell to packers rather than to sell to the H.M.A. The latter choice provides a premium of six cents per lb. and the former to our minds is even more profitable."

Again, the above survey revealed that for Wellingtonians, while 78% of homes surveyed had honey in the house at the time of survey, only 18% of those responding could recall the brand purchased from memory. They comment on point of sale promotion as follows:

> "We were unable to find any promotional activities undertaken by potential competitors and displays in retail stores ranged from satisfactory to very poor. Often honey products were in an obscure part of the store and to be frank some of the displays were very dusty and had the appearance that no honey had been taken off the shelf in the last six months. The often dull and unappealing packaging did not help the situation."

Doubtless this report by the two business students from Victoria University will be denounced by the industry in the same way as the Bale Report, prepared by Mr M.D. Bale of the Department of Agricultural Economics and Farm Management, Massey University, was denounced back in 1967. However, the fact remains that all the reports that do exist dealing with aspects of honey marketing suggest that improvements could and should be made.

The New Zealand honey exports account for between 1 and 2% of world trade in honey, and are equivalent to 3% of West Germany's imports. Only 100 beekeepers are totally dependent on bee-farming for a livelihood. Domestic consumption per head is one of the highest in the world, the bulk of which is supplied by private packers. These facts suggest that the superstructure of a statutory marketing authority with a trading function is inappropriate and excessive for the size of the industry where the majority of the participants must be classified as hobbyists or part-timers. Structurally the Authority's trading function must incur higher costs than those of the private packer. It is my belief that the objectives of the Authority can be achieved in the absence of a trading function and result in improved returns to honey producers.

A healthy and viable honey industry is vital to the well being of other primary industries, especially those engaged in fruit and seed production. With this in mind, and fully aware of the likelihood of reduced prices for honey overseas in the near future, I reiterate that a supervisory role as opposed to an active trading role by the Authority, would greatly reduce the source of conflict within the industry and permit time and effort currently devoted to dissension to be directed more productively to the production, promotion and marketing of honey.

I have already mentioned that New Zealand has one of the highest per capita consumption of honey ratings in the world. This has been achieved in spite of an almost total lack of market research, promotion, brand creation or product development by the industry. The only way in which I can explain this apparent paradox is by recalling that the H.M.A's payout of the past 10 years has averaged 13 cents per lb. At that sort of price, who needs marketing!

On the other hand, if you are selling 26 ounce bottles of sweetened flavoured carbonated water at 40 cents, you must have and do find marketing.

In New Zealand some 80% of the population suffer from malnutrition, mainly because they eat too much. We enjoy cheap meat relative to many other countries - and yet Kentucky fried chicken with the help of the Colonel's recipe has successfully penetrated the New Zealand market - certainly not by being price competitive, but by a carefully researched marketing package. Thus marketing-wise, the New Zealand honey industry has still some way to go.

I have endeavoured to be provocative in order to generate discussion and hopefully to provide a backdrop for this morning's Seminar on marketing.

MARKETING OF HONEY WITHIN NEW ZEALAND

A session in which THREE speakers, each involved in different aspects of honey marketing, were asked in their 10-minute talks to comment, as they see it, on the trends, the potential and the problems for honey on the internal market.

SPEAKER No.1

Mr Curtis Wicht
General Manager
New Zealand Honey
Marketing Authority

After less than 3 months experience in the beekeeping and honey industry, 3 days of a National Beekeepers' Association Conference, 2 days of this Seminar, I feel somewhat diffident in addressing a Group so knowledgeable as this - yet I feel very optimistic for the future of the Industry. Beekeepers, executive and officials have been very kind to me here and at Palmerston North. Although I have no experience in this Industry, I have had over 23 years experience in Sales, Sales Management, Marketing and Marketing Management, and have been fortunate in studying marketing in New Zealand, Australia, the United States and the United Kingdom.

My experience has been the marketing of food, and honey comes within that category, and one cannot but be amazed to find how little the principle of good orderly marketing varies from one country to another, and from one product to another.

The problems are not dissimilar - market trends follow similar patterns, and good marketers use very much the same rules to achieve their objectives.

Perhaps the most misunderstood function and the most incorrectly defined word in business parlance today is "Marketing". I have heard it described by top business and management people - who should know better - in so many incorrect ways. I have heard it described as the function of Production, of Sales, of Merchandising, of Advertising, and in so many other ways. In fact, all these functions are embraced in marketing, but collectively, not individually.

Briefly, I define marketing as the process of determining consumer demand for a product, motivating its sale and its distribution into ultimate consumption at a reasonable profit.

Because a weak link in a chain can prejudice the ultimate success of a product or a service, then a marketer must be involved at every stage to ensure that the total policy carries through to the end result.

Competition has been greatly intensified, it is becoming more so, and the policies and the practices of as recent as 1972/73 may not be good enough for tomorrow.

New Zealand is following world patterns. Big businesses are getting bigger. Small businesses are getting smaller - so too are big industries getting bigger, and more sophisticated - they must do so to survive.

Ten years ago 85% of the retail business was done by the small retailer, who represented 85% of the retail shops. Today the small retailer accounts for less than 28% of the dollar volume of food retailing and 45% of the shops now account for 95% of total retail sales, and extending further, 15% of the shops now account for 70% of retail sales.

So - Retail Shops - Supermarkets - are getting bigger, more effective and are more influential on the market.

Ten years ago, honey represented and commanded more shelf space than it does today, despite the fact that supermarkets are 10, 20, and sometimes 50 times larger.

As recent as the 1960's one in three familes were using honey at some time during the year, and consumption was estimated at about 4 lbs. per head; therefore, users were consuming about 12 lbs. per head per year.

Estimates for 1973 suggest that less families are purchasing honey, less honey is being consumed and perhaps the most significant factor highlighted, is that the incidence of honey purchasers and, therefore, ultimate consumption, is in the older age group, and that young housewives are not purchasing honey in the same relative volume as their mothers.

If this is so, there will surely come a time when as the older people pass on, and a younger generation comes forward, then honey users and buyers become fewer in number.

Out of every dollar earned, approximately 20¢ is spent on groceries in New Zealand. Amongst the many interesting statistics, is the comparison over a 10-15 year period between Jams and Spreads and Honey. While Jams have double sales, and presumably consumption, Honey has declined by over 50% in the corresponding period.

Predictions are that by 1980 there will be 20,000 different lines introduced for grocery sales. Thus display and shelf space will be very much in demand.

A 40% decline is also predicted in the number of stores, thus the pressure on shelf space and display space is going to become very heavy indeed, and only the most sophisticated marketers will be able to maintain exposure and shelf space. And this is happening at a time when honey has so many things going for it.

There has never been a time when people have been so conscious of pollution, the importance of clean air, environment and environmental influences, Health Foods and a mother's natural protective instinct for her family and their well-being.

If a product can truly and honestly make claim for Health and Goodness, then price is not necessarily the determining factor.

The housewife of New Zealand will pay for quality, she will pay for goodness, particularly nature's goodness - and she will stay with it.

There are, however, certain conditions and factors she will demand - Consumer Testing and Market Research is showing this up very clearly.

She wants a product to be good and remain good. If she buys a sub-standard product, she can, and does, turn off that product, and never buys it again. This is a proven fact. She can buy 1000 products, yet if one is bad or sub-standard, she will remember that one, and completely forget the 999 good ones she purchased.

So perhaps lesson No.1 is to make sure that one markets a product to a good standard and to a consistently good standard, and any supplier who puts a sub-standard product on the market is not only doing a disservice to himself, but also to the Industry.

Mrs Housewife, who undoubtedly is the most courted, studied, researched, and the most influential person in the retail world today, because she, in her very complex way, holds the key to the success of all consumer business, is demanding her products presented in a hygienic, easy-to-use and to re-use container.

I wonder if the honey industry is giving sufficient consideration to her wants, her whims and her purchasing dollar?

I believe the dairy industry were guilty of neglecting the housewife's constant request for soft spread butter, and it almost cost them dearly, and may well still do so.

The wool industry were negligent - they just made wool because it was wool, and neglected some of the important marketing factors which synthetics were able to meet - colour, lightness and continuing research to study consumer needs, - almost too late they recognised a need to market.

I wonder, ladies and gentlemen, if it may be later than we think? Should we not now be taking action to project honey? Tell people about its goodness. Tell people about the clean good air from which honey is produced. Tell people of the energy fa factors and the benefits of honey. Tell people what honey can do for them and their children.

Should we not be considering packing in a manner more acceptable to the public and to a standard of quality acceptable to them and of which this industry could justly be proud?

Ladies and gentlemen, this industry stands at a cross-roads, where it can either go downhill, and at an every increasing rate, to become and remain a cottage industry - because you cannot stand still - the direction is either forward or back - or you can double your potential users by applying good sound marketing principles to the industry.

The choice is yours, but time is not on your side. There have been more changes made in this century than since the beginning of time - more changes in the last 10 years than the previous 60. There will be more in the next five years than the last 20 years.

If this industry can work together in unity, with goodwill, with purpose, and with defined marketing objectives, it must progress, and progress is the one and only way I know to financial reward.

MARKETING HONEY WITHIN N.Z.

SPEAKER No.2

Mr Dudley Ward
"Kintail Apiaries Ltd."
Dannevirke

On the New Zealand market the independent packer and producer-packer plays a vital part in the chain of marketing events from the bulk product to the consumer's cupboard.

To discuss the future potential, trends, and likely problems for the independent honey packer on the local market I must briefly comment on honey production and marketing generally, and the Honey Marketing Authority's policies specifically.

New Zealand's honey crop is disposed of mainly through three channels. About a third is sent to the H.M.A. and this may be sold either on the domestic or the world market. A third is handled by New Zealand's private packers (or producer-packers) and is sold in retail packs on the local market. The remaining third is produced by amateurs and part-timers and is consumed and distributed at local levels.

Most of the honey produced in New Zealand is consumed within the country. In fact we are approaching the stage where, within 20 years, we may well need to import honey to meet local consumption. At the present time however our surpluses are very seasonal. Some years we have almost no surplus, and in other years we have up to 2,500 tonnes. Because the Honey Marketing Authority has sole right to export bulk and retail-pack honey it is their marketing policies that seal the fate for all honey producers, whether they supply to the Authority or to an independent packer.

In years of surplus and with good export prices for honey, as has been the case for the last few years, the H.M.A. has exported most of its takings, which has led to better returns for all producers and to an orderly New Zealand market. The Authority should be complimented for this. Prior to this time the H.M.A. did not pursue the export market with any degree of vigor because it believed it could get a better return on the New Zealand market. Personally I don't believe this for one moment.

In the 1961-1971 period the H.M.A. made little attempt to develop its export market, despite the fact that New Zealand produces a variety of unique sources of honey that must surely appeal to the overseas gourmet-type market. The H.M.A. preferred, on the other hand, to compete on the local market with the independent packers - even in years of over-production. The average payout of just 11 cents per pound, which varied little over a ten-year period until 1971, is undoubtedly a reflection of these policies.

What does the future hold for private packers, their suppliers, and in fact the whole honey industry? The answer depends on the H.M.A., its marketing policies, and its method of operation. At the moment there appears to be a turn-around in the price for honey on the world market - with a very slow movement of honey. If the H.M.A. decides to give up an active investigation of the external market and the removal of surplus New Zealand honey in favour of supplying the New Zealand market, then the New Zealand producer, whether he supplies to the H.M.A. or a private packer, may well be in for tough times. An over-supply on the New Zealand market will cause havoc to orderly marketing, with prices stagnating or slumping.

If the H.M.A. does in fact start to compete vigorously with private packers then a price war/special offers may result. This is the last thing that I would like to see. It would affect all independent packers and their suppliers, and in particular it would affect the H.M.A., its payout, and of course, its suppliers.

In relation to the H.M.A. the independent packers' overheads are moderate. Such H.M.A. costs as honorariums to board members, travel and hotel expenses for all meetings, capital costs on its various plants and equipment are all high in relation to the volume of honey the Authority handles. The independent packer is able to ensure that a more competitive market is available to the producer and to the consumer. He is generally able to buy honey from producers in his own area, and hence lower freight costs from which the producer would obviously get the benefit.

A healthy, competitive marketing system ensures the continuance of efficient producers and efficient packers. The inefficient or the uneconomic will fall by the way-side.

Personally, for an orderly marketing system of benefit to all, I would support the views of the economist who addressed the meeting this morning - Mr Alan Ward (incidentally he is no relation) - when he said that it was unworkable when a primary producing body such as the H.M.A. is in competition with independent marketers on the domestic market. For the small size that our industry is, I believe that free, independent, and unsubsidised competition should be the system of marketing on the local market - as is the case for most food commodities. By all means we should have at the present time a Honey Marketing Authority, but I believe it should concentrate on promoting New Zealand honey nationally and internationally, setting quality standards, and establishing minimum prices for the export of honey, above which independent packers should be free to export. In due course, when New Zealand becomes forced to import honey, the need for such a primary producing body will be over.

MARKETING HONEY WITHIN N.Z.

SPEAKER No.3

Mr Micheal Stuckey
Waitemata Honey Co.Ltd.
Redvale
AUCKLAND

My subject is specialty packing of honeys and I see my role here not as one to tell how we go about it but rather I feel it would be of more value to explain why we do it. With the fantastic crops and high prices I hear we've been getting I am sure some of you have considered buying a new car recently, perhaps you went to your local Ford dealer. Here are some facts which could be of interest for reasons which I hope will become clear later.

Take for instance the Escort range. One basic car and the van. In the car line you get the choice of one or two doors 1100 or 1300 cc motor; so far six choices. With the 1300 you get a choice of manual or automatic - 9 choices. Then there are three factory fitted options - 36 choices, 3 trim colours - 108 choices, 9 paint colours - 972 choices. You can always have other major extras. Out of 50 or more I chose the 8 most popular, this gives 247,860 choices and Ford have another 5 lines in full supply in N.Z. According to the dealers this is only a small part of their world production. On top of this there are 11 major producers in the world and many more smaller ones making about 50 all told. In America last year, figuring all possible combinations of styles options and colours available on a certain new family sports car, a computer expert came up with 25,000,000 different versions of it for a buyer.

I hope by now you are wondering what I am getting at. It's very simply this. Here we have an example of a large International Company selling in a competitive market. They are doing their utmost to vary the product as much as possible. In this way they give their customers a choice of their products instead of just the choice between a Ford or a Datsun. This is how we see our business. We started producing Manuka, Clover and sections - the customer had 3 choices. Now we give the customer 8 choices, not counting sizes or different types of containers. Taking size and containers in account we have 28 different packs and flavours.

We are trying to give our customers the choice in quantity, flavour and form. We have proven to ourselves that with a good product presented well any honey is worth top price. I feel it is a shame that there are still some beekeepers mixing their honey into a bland sweet spread with no character. We are guilty of this ourselves to a certain extent. We produce a honey some years in the Auckland area called Hangi Hangi, or pig weed. This honey tastes vaguely like a pig sty smells and we blend it in with our manuka in an effort to make the manuka go further and yet there are some people who like the taste of it as a straight line. Also this year, because of the failure of the manuka crop, we have had to buy up any strong tasting honey we could find and sell it as a rich flavoured honey under the Manuka label, but we hope this is a temporary thing. Incidently all our honeys are the same price but judging by the way the manuka is gaining in popularity it may not be long before it fetches a premium.

To get back to the cars - while the quality may leave something to be desired the presentation is really fantastic and the promotion is terrific. We must realise that because of their size they do have first-hand access to experts in the field of presentation and promotion, but we too could have access to these experts. If you take a little time to examine our 70 gram pack you will see an example of this. This pack was designed by the N.Z. branch of a large international company, E.S. & A. Robinson. It was designed for the overseas market and the idea is that it is supposed to give the impression of an unpolluted environment. It is a good pack,probably one of the best honey packs in the country and is a good example of what can be achieved by buying the right sort of experience. There is an important lesson to be learnt here, the pack must be designed to complement the product. We have endeavoured to do this to the best of our ability. The 70 gram I have already mentioned, the 1 lb pots and jar labels are designed for the N.Z. market. They are supposed to show the different varieties by the use of different flowers on the label. I feel that the honey industry is about 3 parts through the change from blended honeys to specialty packs

at the moment. This is good if perhaps a little behind the rest of the modern world. Philip Morris cigarettes for instance. For 21 years they sold one major brand of cigarette and since 1954 they have introduced six new brands with so many options on size, filter and menthol that in America the smoker has a choice of sixteen different variations. Have a look at the selections of Watties baby foods now available, the choice must be bewildering to the young mother and there are new varieties coming onto the market almost weekly, yet not so long ago the choice was negligible. What is the choice of honeys?- some producers do have a selection but I feel more could be done. Thyme honey is sold overseas in some places for a very good price and there are many different types of honey produced in a small way in N.Z. today which are regarded almost as a nuisance, but I'm ready to bet there is a market for them somewhere if they are well turned out. Furthermore these honeys should be getting a premium price, both for the producer and packer. After all in many cases it is more expensive to produce a straight line of a source than simply to dump the whole lot into a tank and mix it up.

As an industry we must accept that we live in times of accelerating change. Whereas Mary used to buy brand "X" because her mother and grandmother bought it, nowadays Mary's daughter is being offered such a bewildering array of varieties of any product that any producer who only offers one choice stands a very good chance of being left behind. On the other hand once Mary has found a pack or packs which fit her requirements they must be always available to her.

You will all have seen how honey is being used to sell other products, for instance - biscuits, baby foods and drinks etc. Isn't it time someone in our industry used our honey to sell someone elses product. This would seem to be the next logical step in the specialty packing of honey. For instance I feel sure there would be markets for the types of spread sold overseas such as honey and apricot, honey and peanut butter, etc. The future of honey packing in N.Z. relies, in my opinion, not only in consolidation of what we have now but in further diversification.

People nowadays have more to spend and a few cents extra on a honey pack doesn't mean the same as it used to. The honey packers in N.Z. are not really competing with each other for a share of the market, they are competing with all other producers of spreads and foods throughout the world and this is a very different ball game.

MARKETING OF HONEY OVERSEAS

A session in which two speakers, Mr R.F. Poole, Chairman of the N.Z.H.M.A., and Mr P. Berry, a major comb honey exporter, were asked to comment on the situation, trends, potential and problems in exporting their respective products.

SPEAKER No.1

Mr Russell F. Poole
Chairman
New Zealand Honey
Marketing Authority

EXPORT OF BULK HONEY

First let me give some outline of the history of the Honey Marketing Authority and its operations on the overseas markets over the years of its existence. The Authority was formed as a producer board to take over the honey marketing operations of the Internal Marketing Department, a Government Department which had, during the 1939-1945 war years and for some time thereafter been selling honey and other commodities which had been commandeered by Government as a wartime emergency. The new Authority endeavoured to find an overseas based selling agent, and the logical place to look was Great Britain as this Country's trade was almost wholly still in this direction. Two offers were made to the Authority and the one accepted was from Kimpton Bros. (Red Carnation) Ltd. who were prepared to sell honey on a commission of 4% up to a certain figure and 50% on the balance of the sale price over and above the base figure. This base figure was set by agreement between the Authority and Kimptons and it was a different figure for each grade or category of honey. These agreed prices became known as the "category prices" and the amount obtained by Kimptons above these category prices became known as the "overprice" and the commissions were called the "basic commission" and the "overprice commission".

Within a very short time Kimptons approached the Authority and offered to reduce the overprice commission from 50% to 20%, and this was the figure at which it remained until about 2 years ago.

During most of this time, the Authority contented itself with advising Kimptons from time to time of what honey was available and waiting for Kimptons to sell it. On the face of it, this overprice commission arrangement seemed advantageous to the Authority in that there was a strong incentive for Kimptons to obtain as high a price as possible above the base price, and consequently a better return for the Authority. One disadvantage was that when honey was meeting a poor demand Kimptons would be reluctant to sell, and if this coincided with high stocks being held by the Authority and payments to beekeepers were to be met, a severe strain could be placed on the Authority's financial resources. Another aspect was that sales were made in pounds sterling, and proceeds were only remitted to N.Z. after Kimptons had been paid by the buyer. This meant that the Authority was often not paid till 6-9 months after shipping the honey, and in many cases 12-18 months after paying the beekeeper his advance payments for the honey. Also, adverse changes in currency exchange rates sometimes meant the Authority received less than what had been anticipated at the time the sale was made.

The Authority's overseas sales had been bulk honey, and eventually moves were made to export in retail containers as it was felt that higher returns could be obtained this way, but the Authority was in the awkward position of being cautious of generating too much demand for packed honey in case it could not give continuity of supply, there being no compulsion on beekeepers to send their honey to the Authority to ensure it of a steady level of intake. In selling packed lines there were other difficulties which did not exist with bulk honey. Every country had different regulations relating to size and shape of containers, the net weight of contents, the material from which the container was made, the information required on the label, or in some cases not allowed on the label. For example our usual label in N.Z. says "pure N.Z. Honey" but some countries will not allow the word "pure". Despite these difficulties the Authority over the years has built up a reasonable volume of exports in retail packs to U.K. Australia, Japan and a number of South East Asian countries.

Some 2½ - 3 years ago Japan, which had bought mainly from China,came on the world market seeking large quantities of honey, and about this time the Authority had large stocks unsold as Kimptons were experiencing difficulties in moving the quantities being offered them. The Authority was therefore fortunately placed in being able to sell to Japan at better prices than in England, and on much more advantageous terms. Once the honey was loaded on the ship and the documents lodged with the bank the Authority was paid for the honey, and although the sale was still made in a foreign currency, the time between selling and being paid had been shortened to the point that many shipments were paid for shortly after the honey was received from the beekeepers.

In all this, the amount of honey exported by the Authority has not been high in relation to world imports. Japan, Germany and U.K. between them import well in excess of 50,000 tons annually and N.Z. only exports about 1,000 tons annually, and herein I feel lies our weakness. We are not looked upon by any of the importing countries as one of their main suppliers, but are regarded more as someone to turn to when they cannot get their requirements from their main suppliers.

Another problem which the Authority faces in trying to establish itself on the export market is its inability to guarantee continuity of supply, due mainly to the fact that it has no guarantee of supply from the N.Z. beekeeper. Many beekeepers tend to regard the Authority as a buyer of last resort - a sort of benevolent institution always there to take whatever honey they could not sell elsewhere, and give them a better price for it than they could otherwise get themselves. Some of these honeys require re-melting and blending to remove strong flavours or reduce moisture content, and in many cases would be, if not unsaleable, certainly unexportable in the condition in which they left the beekeeper's premises. It has been the preponderance of these problem honeys which over the years have contributed to the low payments by the Authority, and which could reduce payouts in the future, if as would appear, the overseas price boom of the last 18 months is over.

As with all selling, the customer is always right, and if what you are selling, or the manner in which you are presenting it is not what the customer wants, then it is necessary to either comply with his requirements or lower your price. In many cases the beekeeper regards his job as being to remove the combs from the hives and extract the honey from them. What happens after that is someone else's job and it is over to them how they go about it. This is just not the case, and every beekeeper should endeavour to present his product in the form most acceptable to the customer. In many cases, the beekeeper tends to regard the Authority as an organization laying down conditions to make life difficult for him, when, in fact, the conditions are aimed at meeting the requirements of the Authority's customers and as the Authority is the beekeeper's selling organisation, then the Authority's customers are the beekeepers' customers. One example of what may be required in the future is that all 44 gallon drums contain the same weight of honey. We are the only country selling to Japan which has drums of varying weights of contents, and some Japanese buyers have indicated that they may not be prepared to accept this state of affairs much longer.

It would seem that N.Z. will have an exportable surplus for some time to come, and it is also likely that South East Asian countries, such as Japan, which are becoming more Westernised in their living and eating habits, will continue to require increasing amounts of honey. However their ability to pay the price levels acceptable to us to maintain our standard of living is conditional on the consumers in these countries having a living standard and wage high enough to allow them to buy our products, which, after all, is not an essential part of their diet, but more of a luxury food.

What is the position today overseas and how would the N.Z. beekeeper have fared without an Authority and being left free to sell overseas himself? Up until about three years ago, the prices obtainable overseas were less than could be obtained on the local market, and few, if any beekeepers would have wanted to export.

With the recent improvements in overseas prices however, there was much more incentive for the beekeeper to export himself, and this was aggravated by the decision of Government to limit the price payable by the Authority to the beekeeper. Our neighbouring beekeepers across the Tasman had no such restriction, and their incomes reflected the high world prices. There was an upsurge of interest in beekeeping, and manufacturers still have back logs of orders for hives and honeyhouse equipment, with established hives being sold at prices around $40 - $45 each.

But what is the position right now, when overseas demand and prices have dropped? I was in Australia at the beginning of last month, and spoke to many beekeepers from all of whom I heard the same story. "All my drums are full of honey, all my supers are back on the hives and are full of honey ready to be extracted, but no one is buying honey. I'm just waiting to see what will happen, but I hope something will happen soon because I need some income." Many of them spent some of last year's record incomes on expanding their outfits, thus producing more honey this year to add to the already embarrassing amount being offered to Australian exporters.

Some other world reports received recently are :-

U.S.A. Most Southern States are experiencing poor crops with estimates ranging from 60% of last year to the worst crop for more than 20 years.

Canada The season is a week or so later than usual due to cool weather and copious rain. There are estimates of as much as a 10% increase in total colonies to go into production.

Argentina Due to an internal export tax of 29%, most beekeepers cannot economically export at present prices, and are retaining most of their 1974 crop, while they try to get the export tax eliminated.

Brazil 1973-74 crop is up about 30% on the previous season, with export prices at 42-43¢ U.S. per lb.

Germany Buyers are reported to be in possession of sufficient stocks to last for a few months and they view the current prices as too high. With sizeable quantities still in Argentina and Mexico, buyers prefer to hold back hoping for further price decreases.

Japan Still has stocks from last year's buying, and buyers do not appear anxious to obtain further supplies other than at bargain prices.

To summarise, I would say that -

1. New Zealand will have an exportable surplus for the foreseeable future.
2. New Zealand's exports of honey are insignificant by world standards, and cannot hope to influence world market price trends.
3. Our best hope of improving overseas returns is by every beekeeper doing his upmost to improve the standard of his honey so that our honey sells by quality and reputation, and thus commands a premium price.
4. We should concentrate our efforts on a small number of importing countries, as the quantities we have available will not allow us to guarantee continuity of supply to a large number of buying countries.
5. The concentration of export selling in the hands of one organisation makes for greater stability than can be expected if every beekeeper were allowed to export his own honey.

MARKETING HONEY OVERSEAS

SPEAKER No.2

Mr Percy Berry
Arataki Honey Ltd., Havelock North
(paper read by Mr Michael Stuckey)

EXPORT OF COMB HONEY

To a comb honey producer and exporter it is the marketing of his product that often proves to be the most harrowing. Over the many years that we have been exporting comb honey we have learnt many things. In this paper I wish to pass on a few tips.

A. PROCEDURE FOR THE EXPORT OF COMB HONEY

Before loading on board ship.

1. Negotiate sale and obtain written contract from buyer setting out, in particular, the documentation required for the consignment.
2. Book shipping space.
3. Have honey graded by Ministry of Agriculture and Fisheries and obtain grade certificates.
4. Forward to the Shipping Company:

   Application for permission to Export (Customs Form No. No.C 326) - 2 copies.

   Export Entry (Form 22) - 7 copies. Quote weights in kg, export code No. 061.600.0

   Grade Certificate - 1 copy.

When Honey has been loaded.

5. The shipping company will return two negotiable bills of lading, two non-negotiable copies and a freight account, plus the approved Applications for Permission to Export and several copies of the Export Entry.
6. If the buyer requires that the bills of lading be marked "freight pre-paid", see that this has been done.
7. Deliver to your bank the documents required by the contract or in the letter of credit, if applicable. These documents would usually comprise two sets, each containing:

   Negotiable bill of lading, endorsed on the back.
   Invoice in triplicate.
   Certificate of Origin, usually form XS 112 for the United Kingdom. Have this form certified as correct by the local Chamber of Commerce for shipments to Europe - usually 2 copies. Exports Entry - 1 copy.
   Draft for the amount of the invoice, drawn for payment in accordance with the terms of the contract.

8. Airmail a non-negotiable copy of the bill of lading, an invoice, Certificate of Origin and Export Entry to the buyer.

B. METHODS OF PAYMENT

It would be usual to require the buyer to establish a letter of credit for the value of the order. The money is then waiting for the exporter at his own bank in New Zealand as soon as the goods have been shipped and the required documents produced to the bank.

This does not necessarily mean though that the buyer has to actually find the money before the letter of credit can be established. Payment is not made until the date specified in the draft, although the buyer will pay interest from the date the exporter received payment in New Zealand until the buyer pays for the goods in his own country.

The documents are sent to the New Zealand bank's agent in the buyer's town. The draft must however be accepted (that is, signed or "sighted") by the buyer before he can obtain the bill of lading, which represents the authority to collect the goods from the wharf. Depending on the terms of the deal, payment for the draft may be :

1. At "sight" which means that the buyer pays as soon as the documents arrive at his bank.
2. A specified number of days after "sight"
3. On arrival of the goods.
4. A specified number of days after arrival of the goods.

C. EXPORT GUARANTEE INSURANCE

In some circumstances exporters are able to take out insurance against non-payment by overseas customers. This insurance is undertaken by the Export Guarantee office, a subsidiary of the State Insurance office.

Details are as follows:

1. A policy is taken out with the Export Guarantee Office and a small deposit premium paid.

2. The approval of the Export Guarantee office for an insurance cover must be sought before shipping any goods in respect of which the insurance is required.
3. After checking on the credit rating and the general standing of the buyer the Export Guarantee office will either approve insurance up to a specified figure or will decline to grant any insurance.
4. When the goods have been shipped a return is made to the Export Guarantee office and the appropriate premium paid.
5. The premium rates vary according to the credit grading of the buyer's country and the length of credit. The premium rates for the lowest risk countries range from 18 cents per $100 for "sight" transactions to 32 cents where payment is made 180 days after "sight" (i.e. acceptance of the draft by the buyer).
6. If a buyer defaults the Export Guarantee office will pay the exporter and try to recover the debt from the buyer.

D. INCREASED EXPORT INCENTIVE

For many years now there has been a taxation incentive for increasing your exports of commodities which are outside the basic primary products. Comb honey has qualified for this incentive, but not bulk honey or crude unrefined beeswax.

In 1973 the qualifying products were amended by deleting all honey but I understand that, in response to the comb honey producers' representations to a special committee set up for the purpose, it is likely that comb honey will once again qualify.

The incentive may be summarised as follows :

Twenty percent of the amount by which exports exceed the average exports during the "base period" may be deduced from your profits before taxation is assessed. The "base period" is the first three of the six years immediately preceding the year of income.

For example, if the 1974 financial year exports are $20,000 and the three years 1968, 1969 and 1970 averaged $15,000, then $1,000 (20% of $5,000) may be deducted from your income before taxation.

If a company is paying 50 cents in the dollar taxation, the tax saving is equivalent to 10% of the selling price of any qualifying increased exports. In other words a New Zealand exporter has a 10% price advantage over competitors from other countries who do not have similar concessions.

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Additional comments by:

Mr Michael Stuckey
Waitemata Honey Company
Redvale, Auckland.

(Mr Stuckey delivered Mr Berry's talk on his behalf.
In presenting this address Mr Stuckey raised other points worthy of note.)

Comb honey production and its marketing has developed slowly but steadily. It has progressed at its own pace. Personally, I have found comb honey to be far more challenging,and rewarding, than bulk honey production. A degree of achievement is obtained when you can see a product pass through all its stages; from its production, to its packaging, labelling and dispatch as a retail commodity.

If you intend to go into comb honey production, don't jump in boots and all - try 10 hives, not 100. There are plenty of people to help, including the Comb Honey Producers' Association, and the Trade and Industry Department. In selling you comb honey make sure it is a "subject to supply" contract, just in case you have a crop failure.

THE PACKAGING AND LABELLING OF HONEY

*Mr C.L. Barber**
Supervising Inspector
of Health,
Health Department
Rotorua.

Summary

The Health Department, under the Food and Drugs Act 1969, is responsible to see that all food products, including honey, are handled, packed and displayed in a hygienic and honest manner.

The Food and Drugs Regulations 1973 defines honey specifically as the "sugar product contained from the comb of the honey bee. Honey shall contain not less than 60 percent of reducing sugars calculated as anhydrous dextrose, and not more than 20 percent of water. Honey shall not yield more than 0.4 percent ash." Honey by definition is a pure product. If it departs from these tolerances, or additives made to it, it cannot be called "honey".

All food for sale must be labelled in a manner, style and position set down by the Food and Drugs Regulations. Every container of honey must contain the name "honey", the net weight, and the name and address of the manufacturer or seller of the article. This is the "principal display panel". With respect to the address, a telegraphic or code address or a Post Office box number is not sufficient; however, for a corporate body, the name of the town is sufficient.

Honey packers must pay particular attention to claims they may make or imply about honey. Any written or pictorial matter appearing on or attached to or supplied with honey that directly or indirectly contradicts, qualifies, or modifies the label requirements is an offence under the Food and Drug Regulations 1973.

Regarding the labelling size, the word "honey" appearing in the principal display panel must be prominent in height, visual emphasis, and position so as to be conspicuous by comparison with any

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* Mr Barber replaced the scheduled speaker, Mr O.T. Walsh, Senior Inspector of Health, Rotorua.

other matter appearing on the principal display panel. In the case of a cylindrical container, the width of the principal display panel on the cylindrical surface is not to exceed one-third of the circumference.

Claims about the vitamin and mineral contents of honey cannot be made unless the statement specifies their proportions in honey.

The onus is on you to package and label your product in a correct manner. If you have any doubts or queries do not hesitate to discuss it with your local Health Department Officer.

THE HOUSEWIFE'S ACTION AND REACTION TO THE HONEY PACK

Mr Peter Dickson
Lecturer in Management Studies
University of Waikato.
Hamilton.

Introduction

Do apiarists and their packers need to concern themselves with the honey pack? Doesn't honey, even despite its packing, sell itself?

In the short term the answer is yes but a longer term answer can proceed on the following lines. Loyal consumers, suffering from poor packaging, become very unimpressed with the concern apiarists show toward their own product and the consumer! Politics and price-control create a need for pressure-groups, including apiarists, to trade on public sympathy - if not today, tomorrow. Frustrated consumers become publicly most unsympathetic. Of more general concern is the fact that honey is losing its past share of the housewife's grocery dollars.

However, the author considers the most important reason why honey packaging can stand improvement is because the pack must be seen as an extension of the product, not as an ever increasing irksome cost. Actual sales tests conducted for some of the largest and most knowledgeable marketing organisations in the United States have indicated that changes in illustrations or colours on packs can double, or halve, brand sales of convenience goods.[1]

Subtle visual or convenience differences in the pack can have not-at-all subtle sales effects.

Housewives are by no means strongly brand loyal when buying honey. About two-thirds of the housewives in this study attempted to name the brand of honey they had in the house. When this was

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[1] see "How much value can be Added Through Packaging"
D.W. Twedt Journal of Marketing vol.32 January 1968
"A Cash Register Test of Sales Effectiveness"
Journal of Marketing vol.26 April 1962

checked less than half had correctly named the brand!

The upshot is that while consumers may have clear 'type' preferences (e.g. clover) they can be attracted away, from brand loyalty, by other features such as packaging and price. Packers and producers, angling for larger sales and market dominance or hedging against consumers' concern for value-for-money can consequently reap returns from improved packaging.

As the Spanish mark Baltasar Gracian said, more than 300 years before today's movie starlets or "honeys":

> *"To be of worth, and to know how to show it, is to be worth double."*

Methodology of Study

The study involved interviewing 104 Hamilton housewives. There is no intention to present the findings as conclusive because of the small sample, but some of the opinions are expressed so strongly as to be ignored or disclaimed at the peril of the interested parties.

The subject's households were chosen randomly and the interviews, undertaken in July 1974, were conducted according to a strictly prescribed procedure and questionnaire. The interviewers were third year Marketing students studying at the School of Management Studies, University of Waikato.[2]

To aid in the understanding of the results the results are split into four main sections. Each section explains the importance of packaging factor and the pertinent findings. The four aspects can be summarised in the acronym VIEW: [3]

Section 1	Visibility
Section 2	Information
Section 3	Emotionally appealing
Section 4	Workable

The main points are summed up in the Conclusion.

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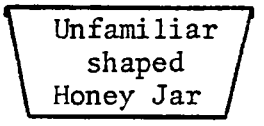
[2] Further particulars on the design and results are available from:
Peter Dickson
Department of Management Studies
University of Waikato, Hamilton.

[3] This acronym should be credited to Twedt. op cit.

Section 1 : Visibility

Visibility is a measure of how easily the pack can be found in its natural habitat, usually a mass display. Honey packed in an unfamiliar container will require a large "HONEY" label to be seen or perceived as honey.

Does not need large "Honey" label to be "visible"



Needs large "Honey" label to be "visible" as honey

Section 2 : Information

An effective pack must quickly and clearly signal what it contains. With honey that is; the type of honey, brand of honey, colour of the honey, price of the pack and the weight.

The "type" is seen by many to mean the nectar or flowers used to produce the honey. The brand is associated with type but can also indicate the apiarist or the packer.

What do you look for on the container.?

Item Mentioned	Frequency of Mention
The "type" of honey	49%
The brand of honey	40%
The Price	33%
The Weight	12%
No response	16%

(totals more than 100% as some subjects mentioned two or more items)

Section 3 : Emotional appeal

Packages, like people, have definite personalities. Combinations of design elements such as shape, texture, colour, illustrations, materials used, all contribute to a total image - called the pack GESTALT - the pack seen as a whole. Colour and illustrations are first discussed as ingredients in this total pack impact.

Colour:

The major colour of a pack lays the foundation for the total effect. An early writer has suggested the colour of the word "Honey" should complement the colour of the honey itself. The base colour of the container, he suggests, should be a reddish blue for light honey and a dark blue for amber honey.* This study indicated that blue was a least preferred colour.

Which of the following colours would you like your honey container to come in ?

Colour description	First Choice
Stone white	20%
Canary yellow	20%
Pacific yellow	12%
Kelly green	12%
Hot orange	8%
Bright red	8%

It appears that the base colour of the honey pack should be bright and modern or related to honey colours.

Illustrations:

Illustrations on honey packaging should obviously relate to the product or its use, i.e. bees, honeycombs, beehives, flowers (especially the nectar gathered by the bees for the brand in question), cartoons of children or bears eating honey.

Shaw hypothesised the following:

> *"A bee, as an insect,-often is not appealing to the housewife. Modern marketing theory is to exclude bugs from food and to the uninformed a bee is a bug".*[4]

This author's own armchair analysis is that you would have to go a long way in New Zealand to find housewives or children over 5 calling a "bee" a "bug" or "insect". Surely almost all consumers are taught very early in life the following?

a. Bees produce honey which is very kind of them.

b. When they do in fact hurt us, it hurts them much more.

c. Bees in fact loathe wasps and other bugs as much as we do.

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* Dr F.R. Shaw "Some Thoughts on Honey Labels and Containers" American Bee Journal, 1952

[4] Op cit (see earlier reference (Dr Shaw)

For these reasons and because of its "honesty", "industry" and "commitment" a bee is much more "human" (is seen to have human characteristics, or characteristics that humans are meant to have !) than the common "bug".

However, rather than rely on supposition, the consumer was consulted.

What ideas, objects or animals do you think most people/children/ you would like to see illustrated on the honey container?

	Frequency of Mention		
Mentioned	Most People	Children	Yourself
Bees	56%	42%	46%
Bears	18%	28%	10%
Flowers - Ordinary	14%	5%	15%
Clover	4%	2%	10%
Other Animals	2%	10%	2%
Cartoons	1%	5%	1%

The conclusion that is tentatively drawn is to have bees, flowers or bears on packs in that order, for adults. For children it should be bees (perhaps a cartoon character), bears and other animals.

Overall Total Pack Impact

A test of the whole emotional impact of several 1 lb honey cardboard wax containers was conducted. From a collection of about 40 old and new containers, eleven different packs were chosen for testing.[5] These designs did not necessarily reflect the current choice to the Hamilton housewife. Some were strangers, some have been superceded.

The choices were made so as to provide as wide a range of different packs as possible. The subjects were asked to choose the pack they considered the most attractive and the pack they considered the least attractive. This does not mean that the chosen packs are the most or least attractive in New Zealand - no doubt there are "better" and there are "worse" in the housewife's opinion.

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[5] The collection of 40 containers was supplied by Mr G.M. Walton, Apicultural Advisory Officer

	Test Pack	Most Attractive	Test Pack	Least Attaactive
H	"Citrus Apiaries Honey	40%	A "Arataki Light Amber"	47%
G	Fells "Honey"	18%	E "Creamy Clover"	19%
I	"Pohutukawa Honey"	18%		
B	"Honey Gold"	18%		

The expressed reasons for the above preferences were, in order of importance -

H "Citrus Apiaries Honey" - attractiveness of natural flowers; colour scheme and design; distinctive, unusual; clearly indicates type.*

G Fells "Honey" - colour scheme and design which has honey colours and also symbolises flowing honey.

I "Pohutukawa Honey" - distinctive, eyecatching, Pohutukawa flower; indicates type.

B "Honey Gold" - distincitive; different; cartoons; symbolises honey.

The expressed reasons for the above dislikes were, in order of importance -

A "Arataki Light Amber" - dull, unimaginative, uninspiring, plain, no illustration, colour is garish; doesn't relate to honey, irrelevant; printing is ugly; colour and printing is loud.

E "Creamy Clover" - dull, unimaginative; colour combination; somehow doesn't relate well to honey.

Section 4: Workable

In addition to protection the "workability" factor includes such packaging aspects as; ease of opening, utility of the container for secondary use (re-use), storability of the package in normal household use. The questions that have to be answered are:

1. In what units does the consumer prefer to buy?
2. Is the honey transferred to another container at home or on display?
3. What sort of container is preferred?
4. What sort of lid is preferred?

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* Editorial note: Based on its "Citrus Honey" label and its background of citrus flowers, this pack design led housewives and interviewers alike to believe that it contained dominantly citrus-type honey. Apparently this is not the case.

1. In What Units Does the Consumer Prefer to Buy?

A majority (53%) purchased 1 lb containers. Even more, (58%), thought they had purchased 1 lb containers.[6]

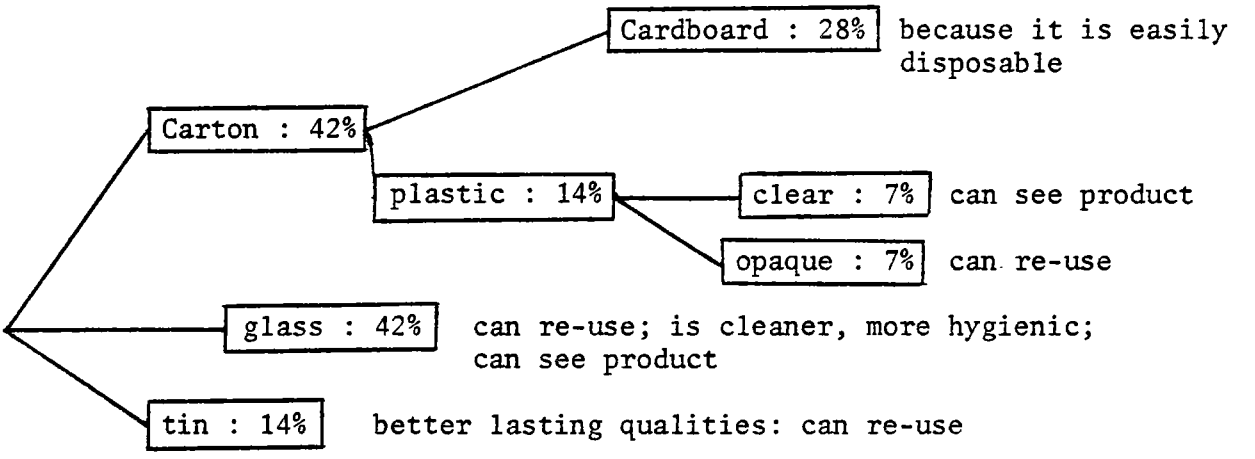
	Checked size	Preferred size
½ lb	22%	17%
1 lb	53%	51%
2 lb	6%	10%
3 lb	6%	5%
5 lb	11%	15%
Larger	5%	2%

2. Is the Container on Display in the Home?

Although not directly investigated it seems that the increased casualness of meal preparation has increased the frequency of appearance of the honey pack on the dining table. A "yes" answer to this question places emphasis on the need for an attractive container which is clean and hygienic.

3. What Sort of Container is Preferred?

Frequency-of-Preference Diagram with major reasons:



4. What Sort of Lid is Preferred?

Lid Preferred	Frequency of Response
Cardboard push-in lid	5%
Plastic clip-on lid	92%
No response	3%

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[6] A Wellington Pilot Study in 1973 indicated that 50% of that sample preferred the 1 lb container.

Percentage who are Prepared to Pay Extra for Plastic Clip-on Lid	Cents
24	0
25	1
25	2
7	3
6	4
5	5 or more
92%	

The average amount extra that all the housewives are prepared to pay is 1.5 cents. Just over 40% were prepared to pay 2 cents or more for the plastic lid - a significant market segment.

Conclusions

The greatest concern of housewives is obtaining a functional lid for the cardboard carton. A large majority are satisfied with the container but over one third of all housewives complained about the problem of getting the cardboard lid back on the container, of the lid bending, tearing, breaking, and of the resultant unclean, unpresentable mess.

Their suggestion came across loud and clear. Without prompting, those that complained all suggested a strong plastic clip-on lid. Over 90% of all the housewives prefer such a lid and many are prepared to pay for its convenience. Perhaps the lid colour can complement the honey contents for easy "type" identification?

The 1 lb waxed cardboard carton is still very competitive with glass while there is a further distinct segment of consumers who prefer honey in larger quantities, in tins.

The type of honey must be clearly indicated by the packer - the retailer will clearly indicate the price. Some new approaches to the use of base colours and illustrations are suggested with some previous "expert" opinions being contested.

Pack comparisons across a wide range of alternatives indicated that housewives dislike dull, plain, unimaginative packs that "convey" no information. Distinctive, eyecatching designs or illustrations in bright sympathetic colours are considered most attractive.

The crunch question of course is, who pays for better packaging? Providing the above recommendations are supplied to the designer at the early planning stage, next time pack design is undertaken, improvement in the Visual, Information and Emotive factors should cost little extra. Plastic Clip-on lids (in the matching colour or plain white) will cost several cents extra. While many consumers are prepared to have the price passed on, and the price increase can be buried in inflationary "price increases", it is recommended that, initially, packers should carry the cost.

An Appendix to this paper on housewives' price sensitivity to 1 lb Honey packs (or units of 1 lb of Honey) suggests that a substantial number of housewives regard Honey as overpriced.*

If money is to be spent on improving packaging, it must be well spent.

Consumers are always prepared to pay a little more if they consequently get better-value-for-money. The "right" improvements in packaging and presentation can provide this better-value-for-money.

Acknowledgement:

The following senior students studying Consumer Behaviour at the University of Waikato undertook the interviewing in the pilot study and made numerous helpful suggestions in the design of the questionnaire. They were :

K.D. Bear	K.L. Hyde	D.C. Steward
B.M. Copsey	G.W. McGlynn	R.J. Stringfield
S.P. Ellis	S. McNamara	K.C. Yeo
D. Fitzsimons	T.J. O'Boyle	

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* Full details of this Appendix are available from the author. In brief the majority of housewives paid less than 50 cents/lb for their last honey purchase. Most housewives were prepared to pay no less than 30-35 cents/lb nor more than 50-55 cents/lb for their honey.

THE AMERICAN FOUL BROOD SITUATION

Mr Brian M. Milnes
Apiary Instructor
Auckland.

Introduction

It is almost impossible to read a bee journal or beekeeper's newsletter these days without some reference being made to Bee diseases. Yes, - like most other insects and animals, bees can become diseased. Why, after so much emphasis and instruction on techniques for identifying bee diseases is it so necessary to continually harp on bee diseases out of all proportion to other bee management problems? As I have pointed out many times in the past, bee disease is only one of the problems, but one which need no longer present a major problem.

I wish to discuss one disease in particular and that is one known to us all as "American Foul Brood". This disease is the most serious disease affecting honey bees in New Zealand, and is caused by the microscopic spore-forming bacterium called Bacillus larvae. This disease attacks the young larvae during the time when they are being fed by the nurse bees. It includes the larvae of all three castes - worker, drone and queen. The infected larvae usually die, just after the cells are capped over.

The disease, if allowed to go unchecked, can spread very rapidly and many hives can be wiped out in a very short time - as no doubt several beekeepers present today can verify. Fortunately this disease does not affect any other insect or animal and cannot affect humans in any way. There is no known cure which is 100% successful; therefore hives must be burnt.

Its spread

Bacillus larvae spores from some previously established source of infection become mixed with the brood food fed to a young larva by the nurse bees. The spores germinate within the body of the larva, multiplying at a great rate and feeding at the expense of the tissues of the larva itself. Soon after the larva has been

sealed over in its cell by the bees it collapses and dies. When this happens the food supply of the bacteria is no longer maintained, and their growth and multiplication ceases. Each bacterium then transforms itself back into the spore stage.

The spores so produced, now many times more numerous than those which caused the larva to become infected in the first place, are distributed throughout the hive by house bees while attempting to clean out the cell containing the dead larva. Some of these spores become mixed with the brood food of other larvae - thus more and more larvae become infected, the proportion of the brood which emerges gradually becomes less and less, and sooner or later the colony dies out from sheer lack of colony strength.

The spores are very resistant to exposure, to extremes of heat and cold, and to disinfectants. They retain their powers of germination for many years in honey, in old combs kept in storage, or in derelict hives. Experiments carried out by the University of Missouri have established that spores from an infected comb are still viable for a period of more than 45 years.

Signs and symptoms

Every beekeeper should be familiar with the appearance of healthy brood. Healthy, unsealed larvae have a shiny, pearly-white appearance, and until they are about 6 days old, lay coiled in a "C" position in their cells. When a larva is about 8 days old its cell is sealed over by adult bees with a porous and slightly convex cap of wax. The larva spins a cocoon, and the following day stretches out on its back with its head toward the mouth of the cell, and then becomes a quiescent pre-pupa. About a day later, during a short period of activity, the fifth and final larval skin is shed and the pure white pupa is revealed. At this stage the head, thorax, and abdomen are clearly distinguishable, the compound eyes and the rudimentary legs and wings can also be seen.

In general, larvae become infected at an early stage and die soon after they have stretched out on their backs with their heads

towards the cell capping. Infected larvae usually die at the pre-pupal stage, but some die after pupation. They turn brown, collapse on the floor of the cell, and after about 4 weeks form a hard, dark adherent scale. The cappings over infected larvae become moist, dark, and sunken. The adult bees first perforate them and then remove them. When a pupa dies its tongue remains upstanding. This is a definite sign of the disease. Another sure sign is the "roping test". This is indicated when a matchstick is inserted into the larval remains at the sunken capping stage and drawn out as a brown, ropey thread.

The beekeeper's role

Almost every time there is an outbreak of American Fould Brood it can be directly attributed to carelessness on the part of a beekeeper rather than any fault of the colony.

The first essential in the successful eradication of this trouble from an apiary is to find the disease in an early stage of its development and then to immediately eliminate all material and hive equipment which might spread it. While some equipment may be successfully treated under certain circumstances, the safest plan is to destroy completely by fire all diseased bees and bee combs, including all honey present in the hive.

When a diseased colony becomes too weak to defend its stores it is liable to be "robbed-out" by bees from other colonies. As honey is the chief agency by which these spores of American Foul Brood are transmitted whole apiaries may become infected in this way.

Meticulous adherence to the principles of apiary hygiene will certainly assist in maintaining disease-free colonies. Remember, if disease is found in a colony scorch hive tools, and other implements and change into clean overalls before manipulating any other colonies. Wash hands in warm soapy water. Burn dead bees, keep the apiary site clear of rubbish and make sure that a source of clean water is available for the bees.

Wild hives are a residual source of disease and in some areas this is a very serious problem. It is in a beekeeper's own interest that wild hives are destroyed as soon as possible

Under the Apiaries Act 1969 the responsibility for the control and efficient destruction of diseased colonies of bees rests with the beekeeper himself and not with the Ministry of Agriculture and Fisheries. The Ministry's role is a vigilant one to ensure that all beekeepers are carrying out their obligations under the Act.

Beekeepers are required to make regular individual inspections of all colonies of bees owned by them for American Foul Brood disease. Any diseased hives found by a beekeeper must be destroyed forthwith and the Apiary Inspector notified by the beekeeper immediately to this effect. For all practical purposes this means the destruction by fire of diseased hives, including bees, honey, combs and equipment, within the infected apiary.

The Apiaries Act authorises Apiary Officers to inspect colonies of honeybees and if necessary destroy any colonies infected with American Foul Brood disease, or to direct the owners to destroy diseased colonies themselves. This work by the Ministry is intended to complement the work done by the beekeepers themselves.

Most beekeepers, once they have become familiar with the symptoms of this disease, have done their utmost to keep their hives healthy. In fact many beekeepers have entirely eliminated disease from their apiaries; however brood disease is still widespread and the incidence is considered to be much too high. Since the compulsory annual hive inspection by beekeepers was introduced in 1966 a much more accurate picture of the American Foul Brood situation has been obtained than had been available previously. Based on beekeeper returns and on apiary inspection checks we can say that the American Foul Brood incidence represents approximately four percent of New Zealand apiaries and 0.5 percent of hives. On a nation-wide basis these figures have remained relatively constant and show that our existing control measures have proved effective in checking the increase in this disease. However eradication of American Foul Brood disease must be our ultimate objective and the immediate goal should be to hold and reduce the incidence of this disease.

The use of drugs

It is an offence under the Apiaries Act and the Food and Drugs Act to use drugs to combat American Foul Brood in New Zealand. We believe that nothing short of total eradication should be our ultimate objective. Towards this end the New Zealand policy is to burn or scorch all diseased equipment.

Although the use of drugs is prohibited in New Zealand they are used overseas, particularly in North America. Let us take a quick look at some of the work carried out in the United States with respect to American Foul Brood drugs.

During World War II it was noted that several of the sulphur drugs had an effect on bacteria, and a closer look was taken as to the use of these drugs for the prevention and/or cure of American Foul Brood. It was soon discovered that Sulfathiazole was much more effective than other sulfa drugs. Then in 1966, trials were carried out with the antibiotic Terramycin which appeared to successfully control American Foul Brood.

Although the sulphur drugs and the antibiotics do in fact reduce the infection levels of Bacillus larvae they do not cure the disease. These drugs act as a suppressant and only prevent the disease from developing. In other words, the drug merely prevents the bacterial spores from germinating and growing so long as the drug was in the hive. Once the administration of the drug is discontinued the disease is likely to flare up again.

The use of drugs is advocated in the United States. However the U.S. situation is quite different to that in New Zealand. Each American State has its own bee laws and these differ from State to State. Some States allow drugs, others do not; some make burning of diseased hives compulsory, others do not. Some States have no disease laws at all! Yet throughout the U.S. beekeeping operations tend to be migratory and do not keep within State Boundaries. Many beekeepers are forced to use antibiotics to suppress the incidence of disease which is at considerably higher levels than in New Zealand. If beekeepers stopped feeding drugs many would be quickly out of business.

In New Zealand we have an effective eradication programme. Drugs would only suppress or hide the disease, not eliminate it. We do not legislate these drugs for other reasons. There is the problem of drug residues in honey. Honey, by legal definition, is a pure product and it should remain that way. There is evidence of drug-resistant bacterial strains. Terramycin is known to retard brood production.

Conclusion

American Foul Brood should be regarded by all beekeepers as a serious disease. Although its levels in New Zealand are moderate compared to many countries we believe that increased vigilance is required. As beekeepers, you should acquaint or refresh yourselves with your legal requirements under the Apiaries Act 1969 - obtainable for 25 cents at your nearest Government Printer's office.

NOSEMA DISEASE IN NEW ZEALAND

Grahame M. Walton
Apicultural Advisory Officer
Palmerston North.

The disease known as nosema is caused by the protozoan intestinal Nosema apis. This unicellular organism invades and destroys the tissues lining the ventriculus, or mid-gut, of the honeybee.

Nosema has a widespread distribution and has been recorded in most countries where beekeeping is practised. It is perhaps the most common of adult bee diseases.

The infection starts when Nosema apis spores are taken into the digestive system. This occurs particularly when a bee cleans-up infected spore material voided on the bee comb. It may also occur during the food-sharing process. Within 30 minutes of entering the ventriculus the spore may germinate and pass by way of a polar filament, into the ventricular lining. Next follows a sequence of stages (mobile, vegetative, reproductive) until finally, 5-6 days after initial infection spores are released back into the ventriculus. These released spores may either pass out of the bee in the faeces or they may again re-infect the bee. Full infection may occur within 14 days from initial infection.

Spores may remain viable for years within the hive but are quickly killed in direct sunlight. The potential source of danger to honeybees is the infected material within the hive on the comb and equipment. Nosema spores may be voided within the hive during periods of extended confinement or when bees are subjected to other forms of stress. Continuous wet, cold or windy weather encourages the build-up of nosema. Other stress conditions likely to encourage the presence of nosema are frequent colony disturbances and manipulations (shifting of hives, queen rearing, excessive man-handling), colony-confining practices (nuclei, queen banks, queen cages) and the shortage of pollen.

The comb-cleaning activities of workers make them particularly susceptible to nosema. Queen bees are less exposed to infection. Infected queens may be lost within 10-15 days. A failing queen cannot maintain her high rate of egg-laying and workers may attempt to raise a supersedure queen. This may be unsuccessful because her last cycle of eggs tends to be non-viable. Queens confined to cages are more susceptible than free-ranging queens. An investigation in California showed that nosema was responsible for the deaths of 15 percent of queens that died in queen banks. Dr C.L. Farrar, in Wisconsin, attributed 88 percent of queen supersedures to nosema.

Nosema is regarded by authorities as a serious seasonal problem in Canada, United States and in Australia. A heavy infection can shorten the life of a worker by 40 percent. The hypopharyngeal glands of infected bees are affected, reducing the amount of larval food secretions. This may lead to a 30-75 percent reduction in brood production.

As a result of the shortened life span of workers and the reduced amount of brood production, nosema infection has been shown overseas to significantly reduce the amount of honey produced.

Nosema was first detected in New Zealand in 1944; however it is likely that this disease has been with us since the earliest of beekeeping times. New Zealand's year-round climatic conditions usually permit bees to fly freely and defaecate away from hives. Only on infrequent occasions has nosema reached a level of real concern. The last serious widespread outbreak was recorded during the 1946-1947 season when several beekeepers suffered economic losses. During the spring and summer seasons of 1971-1972 nosema was implicated as a contributing factor of the queen-bee losses and poor colony performance recorded in the Rotorua-Waiotapu areas of the Waikato district. A Ministry of Agriculture and Fisheries investigation in this district during January 1972 established that nosema was present in many colonies. Based on the seasonal nosema cycle, the adverse spring climatic conditions, and the shortage of pollen, it can be assumed that the spring levels were even higher.

Arising out of the 1972 Waikato investigation it was decided to undertake a New Zealand-wide nosema survey to ascertain the distribution patterns and levels of this disease. This survey was carried out on a random basis during the months of October and November, 1973. Apiaries owned by commercial and semi-commercial beekeepers (more than 250 hives) were sampled at a rate of one apiary in 30 throughout most of New Zealand. On this basis a total of 262 random samples were obtained. Further "geographic" and "disease-suspect" samples were taken in selected areas. Each apiary sample consisted of 50 bees, obtained by taking 5 bees from the entrances of 10 hives which were selected at random. The Plant Diagnostic Station at Levin examined the samples for spores, using a standard haemocytometer counting technique.

A full account of this survey will be published at a later date upon the completion of a biometrical analysis of the results. However it is possible at this stage to present a general picture of the findings.

Table 1 compares the New Zealand overall infection levels with similar surveys conducted in Minnesota and California. Less than 12 percent of the 262 apiaries randomly sampled showed no evidence of nosema. The bulk of New Zealand's samples fall into the 0-5 million spores per bee range; regarded in the United States as indicating a light to medium infection.

TABLE 1. NOSEMA INFECTION LEVELS AS DETERMINED BY RECENT SURVEYS IN NEW ZEALAND, MINNESOTA AND CALIFORNIA.

level of infection (spores per bee)	% total number of apiaries sampled		
	New Zealand (1973)	Minnesota* (1969)	California* (1970)
No spores	11.6	13.3	90.8
0 - 1 million	39.9	11.9	5.3
1 - 5 million	38.9	23.7	3.3
5 million plus	9.6	51.0	0.6
apiaries sampled	262	302	860

* Minnesota survey: American Bee Journal, December 1969

* Californian survey: American Bee Journal, January 1971.

The highest nosema incidences were recorded in the Westland and Southland districts. High levels were also recorded in the Timaru-Oamaru coastal strip. Samples taken from the central North Island and the high country of Otago and Southland showed in general a low level of nosema.

An interesting result arising out of the nosema survey was the inaccuracies involved in predicting nosema in the field. Very few apiary diagnoses that suggested nosema were indeed correct. The symptoms of nosema are similar to that of other maladies - e.g. dysentery and virus infections.

It is intended to further examine the spore counts to see whether there is a correlation between nosema levels and rainfall, hive strength, hive direction and apiary exposure.

How significant is nosema in New Zealand? Based on the 1973 survey nosema is prevalent, but generally at low to moderate levels. However its latent presence may be regarded as a cause of concern to some beekeepers, especially those involved in operations that place considerable stress on weak colonies - e.g. the raising of queen bees.

The main objective for a beekeeper intent on overcoming nosema is to have clean bees on clean equipment. Heat treatment of stored combs and equipment, 49°C (120°F) for 24 hours, can render nosema spores ineffective. An accurate thermostat is essential - too hot and the wax will melt. Acetic acid is another method that destroys the nosema spore, however this operation is somewhat tedious for commercial producers. A regular comb replacement policy assists in culling out old disease-impregnated brood combs.

An antibiotic fumagillin is effective in controlling the vegetative growth of nosema, when fed in the form of a syrup. Unfortunately the antibiotic has no effect on the spore stage, and unless it is applied on a regular basis infection is likely to recur. Nevertheless fumagillin feeding is recommended for queen bee producers who raise bees in the spring and autumn months. Fumagillin is particularly effective in queen banks and in nucleus colonies.

The effect of feeding fumagillin to colonies as a regular part of colony management was tested in a pilot experiment involving 30 Waikato beehives during the 1973-74 season.

Fumagillin was applied at a standard prescribed concentration to 10 colonies in 3 syrup feedings at two-week intervals, starting in September. Although spore levels showed a significant reduction compared to the honey-fed and syrup-fed control hives there was no effect on the amount of honey produced (Table 2).

TABLE 2. EFFECT OF FUMAGILLIN ON HONEY YIELDS IN NEW ZEALAND AND CANADA

	Surplus honey in kilograms		
	Waikato (natural infection)	Ontario* (natural infection)	Ontario (inoculated)
honey (control)	53.7 ± 7.4	-	-
syrup (control)	46.2 ± 12.6	56.6 ± 20.4	34.4 ± 9.1
fumagillin + syrup (approx. 25 mg/litre)	53.2 ± 10.3	95.6 ± 13.1	90.1 ± 12.7

It is considered that the (light) nosema level recorded in the Waikato during the spring of 1973 was not sufficient to influence honey yields (compare the situation in Ontario). In general, based on the 1973 survey results, regular fumagillin feeding would not be warranted in most New Zealand districts. However the higher nosema levels recorded in Westland and parts of Southland may warrant further fumagillin testing.

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* Furgala B. & Boch R. (1970): The effect of Fumidil B, Nosemack and Humatin on Nosema apis Jnal.Apic. Res. Vo. 9(2), 79-85

TOXIC HONEY - THE PRESENT SITUATION

Mr Douglas A. Briscoe
Apiary Instructor
Tauranga.

Most of you here today will have at least heard something about the subject of toxic honey. Some of you have been more closely associated with this subject than others and possibly for some, toxic honey is little more than just two words. At times I wish I could be in this latter category!

For many years there has been an area in the Bay of Plenty that has been closed off to all beekeeping activities because of the risk of bees collecting a substance, toxic to humans, that is taken back to the hive and stored with honey. For many years scientific workers faced many problems in endeavouring to trace down the actual case. The plant Rangiora was the primary suspect, but eventually it was traced to a honey dew type of material found on certain vegetation.

This toxic material is now known to be caused by a sap-sucking insect called the passion vine hopper; its scientific name, if you want it that way, Scolypopa australis. This little insect lives on the tutu plant (Coriaria arborea) by sucking the sap stream. Waste materials are excreted and dropped from the insect onto the leaves and other parts of the plant. It is a toxic material, colourless, has a slightly sweet taste but when it is stored with honey it cannot be recognised from the honey itself.

I am sure that most of you today would be familiar with this particular little insect. You might not know its name but it is abundant on many plants, particularly in the warmer parts of the North Island. Just to give you a brief description of the insect in the adult stage, it is a brown lacy-winged insect and looks very similar in shape to a Vulcan bomber. In the nymph, or young stage, we refer to it as the cottontail and I am sure most of you have seen this little insect on the twigs and branches of small bushes.

As soon as it is touched or disturbed, it flips away quite readily.

Only a very small amount of the toxic secretion is needed to cause severe sickness in humans. The symptoms of honey poisoning are nausea, vomiting, convulsions, frothing at the mouth, unconsciousness and eventually death. Over the years there have been quite a number of cases of human poisoning caused by this particular material. The Ministry of Agriculture and Fisheries has done much field work in an endeavour to determine the extent and magnitude of the toxic honey problem. An extensive test hive programme has been carried out over a large area in the Bay of Plenty for many years. Honey samples are taken on a regular monthly basis, usually between November and March, and are sent to the Wallaceville Animal Research Centre for toxicity testing. As a result of these tests, supplemented by field surveys examining the population levels of the tutu plant and the passion vine hopper, boundaries have been drawn up and certain areas in the Bay of Plenty have been restricted to beekeeping. The area of the restricted beekeeping zone is quite extensive and stretches from a point just east of Te Puke to Torere, which is east of Opotiki. It extends inland through the lakes of the Rotorua area, across the Tarawera basin and to a point where the boundary meets the sea at Torere.

For many years the beekeeping industry had been anxious to use this restricted beekeeping zone for purposes of spring build-up of hives. The Under-Secretary to the Minister of Agriculture authorised the setting up of an Apiaries Advisory Committee to investigate this possibility and to make recommendations regarding its use. The Apiaries Advisory Committee, consisting of beekeeping industry and Ministry representatives, have permitted beekeeping to be undertaken in this area on specified conditions. Beekeepers located in the Tauranga and/or Hamilton Apiary Registration Districts and owning 400 or more hives are allowed to take into this restricted zone up to 15 percent of their hive holdings. The period for which this is granted is from the first of May to the thirtieth of November. Prior to or after this period,it is illegal to have any hives or apiaries in the restricted beekeeping zone (formerly called the

closed apiaries district). The restricted zone is thus used mainly for spring feed and hive build-up purposes.

For beekeepers who qualify a special permit is issued allowing them to establish their apiaries in the restricted beekeeping zone. A requirement of the permit is that each site must have a minimum number of 30 hives. The purpose of this is to endeavour to be fair to all would-be users of the area and to prevent any one beekeeper establishing a number of small apiaries in selected places.

Up to the present time the beekeeping industry has been very co-operative in the moving in and the moving out of apiaries. I am sure that many beekeepers have benefitted as a result of their use of the restricted zone.

Wherever there is an abundance of tutu plants, the passion vine hopper, and honey bees there is always the possibility of toxic honey production. This may occur in the warmer areas of the North Island and particularly in the Bay of Plenty. The onus is on the beekeeper to take all necessary precautions to see that toxic honey is not produced. The detection of toxic honey may mean the confiscation of a honey crop.

In those areas outside the restricted zone where the conditions may lead to toxic honey production beekeepers should be particularly wary. Honey should be removed from the hives as early in the season as possible. Over many years of testing honey samples we have found that the most dangerous time of the year for the production of this toxic material is from December through to March. We have also picked this material up as early as November, but usually the hopper does not start to show up in large numbers until about the end of November - early December.

You are all probably aware of the publicity on television recently in connection with an outbreak of suspected honey poisoning in the Whitianga area. This recent case involved 8 people, 5 being admitted to hospital. To my way of thinking, undue publicity of this nature does not do the beekeeping industry any good. It was unfortunate that this honey poisoning occurred at all and I am sure that had the recommendation of the Ministry of Agriculture and

Fisheries been carried out, this could have been avoided.

If the beekeeping industry is prepared to take reasonable precautions in relation to the siting of their apiaries in tutu areas and also the taking of the honey crop early in the season, I am sure that there is little risk of toxic honey ever coming onto the market in packed lines.

There is a risk, and I guess there always will be, when people rob or take honey from what we refer to as 'wild hives'. This has been the cause of honey poisoning in humans on more than one occasion and the only way of overcoming this is by education and advising the public not to indulge in taking honey from 'wild hives' in these areas.

Editorial note

A development since the presentation of this paper has been the establishment of a new Restricted Zone. In a Gazette notice published on Thursday September 12 1974 an area embracing the counties of Coromandel, Thames and part Ohinemuri were classified as a Restricted Zone. As a result the keeping of beehives is prohibited in this area betwen 15 December and 30 April in the following year. Bees may be kept in this restricted zone between 1 May and 14 December in any one year upon the issuance of a special permit. The Ministerial decision to restrict beekeeping in the Coromandel Peninsula area follows a number of recent instances of toxic honey poisoning (briefly mentioned in Mr Briscoe's address).

RECENT WORK BY RESEARCH DIVISION INTO VARIOUS ASPECTS OF PRACTICAL BEEKEEPING*

Mr Ivor W. Forster
Senior Technical Officer
Oamaru

When I sat down to prepare this talk I was struck with Walter Rothenbuhler's remark that most beekeepers look upon research as a sort of harmless playwork engaged in by college professors. It has been said that research takes forever to get answers to questions that don't matter anyway.

I think it's fair to say though that most beekeeping research carried out in New Zealand has been, well, what we call applied research. To seek information that will allow problems to be headed off before they happen. To provide findings that have promise of having practical application. Increased production has always been the main criteria.

Few research findings are really spectacular. Research work is seldom glamorous. It's mainly hard, painstaking work. A lot of it is concerned with confirming or disproving opinions and beliefs that perhaps have long been accepted, maybe though without any critical analysis. On the other hand ideas are examined that have been rejected for no sound logical reason.

A lot of things in beekeeping are not very clear cut. Even with regard to quite elementary processes there are sharply conflicting opinions, there are widely varying experiences, there are markedly contrasting results. Even accepted authorities disagree on many issues. Also beekeeping is affected by many circumstances over which the beekeeper has no control. Circumstances he cannot always anticipate. Often although we know what the ideal is we have to accept some sort of compromise to fit in with circumstances and conditions.

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* This address was illustrated with 100 colour slides.

The main thing that research does is to measure actual results. As compared to the skilled practical beekeeper the researcher has the time and facilities to do this. He can pursue investigations through to conclusions even though it may appear that honey production will be reduced. He doesn't have to worry overmuch about the immediate economic repercussions.

From the information obtained we can then say that on an average we would expect so and so to happen under these particular circumstances. On this basis we have looked at several aspects of beekeeping.

Various methods of colony manipulation had been evolved over the years to control swarming and to promote honey production. Some of these were studied. They were found to be ineffective and left us with the three basics of honey production - disease control, feed, and queens. (Forster 1969).

The pollen situation was studied. Pollens from specific sources were examined. The effects of feeding other protein matter as a supplement to natural pollen was investigated. (Forster 1966; 1968a; 1968b). We looked at the performance of queens that had been sent through the post. (Forster 1971a). We found mailing didn't affect a queen's ability to head a honey producing colony. Mailing did though, increase supersedure in the first season.

It was found that clipping the wings of queens didn't affect their colonies' honey storing ability nor did it increase the supersedure rate (Forster 1971).

Colonies in which drones were strictly limited produced no more honey than those where ample drone populations were allowed. (Forster 1969).

An unexplained spring mortality among field bees had caused some perplexity over the years. This was found to be caused by the narcotic effects of kowhai nectar. (Clinch, Palmer-Jones, Forster 1971).

We make no attempt to sell these ideas or to coerce anyone into using them.

I did have a beekeeper approach me over wintering bees on sugar. (Forster 1972) . He was grimly determined to shoot down every conclusion I'd drawn. When I'd patiently explained each point he said, "Well I don't want to feed bloody sugar". I had quite a job convincing him I wasn't even suggesting that he should feed bloody sugar.

Now the advantages of young queens is fairly generally accepted. However world authorities aren't very decided even on this one. In fact if you knew nothing at all about beekeeping and decided to swot this point up you would conclude that young queens didn't matter much - in fact maybe that they were undesirable. Jay Smith comes about the nearest to recommending annual requeening and even he isn't too positive.

Here, going on my own work, on an average first year queens always out-produced second year queens. In one test of 96 hives over three seasons (Forster 1969) and another of 180 hives over two seasons first year queens gave about 30 pounds of honey more than second year queens. Spring queens produced 20 pounds more t than autumn queens. Queens mated from in the hive produced 25 lb more than introduced queens. Colonies that started queen cells during the build up period produced 25 lbs of honey less than those that made no attempt to raise cells. These things all interact to some extent. I mean, say, hives with autumn queens may start queen raising while young spring queens seldom do. As cell raising hives produce less honey this puts autumn queens at some disadvantage. Perhaps not through any deficiency in egg laying but just because a different influence on colony development and behaviour.

With a spring queen you also have the advantage of being able to run a two queen colony for some of the build up period if you want to.

Here again though let me say I'm not against autumn queens. There are many advantages in using autumn queens. There are plentyof bees for raising cells and making up nucs, and much better acceptance if you are introducing queens. Queen rearing facilities are made us of for more of the year. Your hives are

settled down in the spring. This eases pressure of work and allows other aspects of colony management to receive more attention. This is one of thos compromises we must accept.

But if I've faith in my own findings, I must recognise that the absolute ideal is a young spring queen.

Now why don't we have all first year spring queens? The main problem is of course getting queens. It is alright if you can buy them when you want them. Even then some beekeepers are disturbed by losses in introduction. This too, varies terrifically. Butler and Simpson summing up the efficiency of a fairly precise method of queen introduction put the average loss at 10% in the spring. They found that losses rose sharply as the season advanced into late spring and early summer. Particularly so if hives reached a strength where they started queen cells or even contemplated raising cells. Perhaps contemplate is not quite the word to use for a creature that can't think, but it has been shown that the attitude of the colony that leads to swarming starts to build up several weeks even before eggs appear in queen cells.

I checked with one beekeeper who admittedly had had a bad run in queen introduction and we reckoned he would get less than 50 queens accepted out of 200. This chap was just about ready to give up spring requeening. Actually this was early summer and the hives were strong.

Our thoughts must turn then to using queen cells. Queen cells are usually fairly readily available. The rearing of cells is within the capabilities of most beekeepers. If not they can usually be fairly readily purchased. Queen cells do, of course, mean dividing hives in some way to make up mating nucs, of some sort. To do this the beekeeper can be faced with finding queens so that he can create this queenless nucleus or "top" or what have you to mate the queen in.

Queen finding isn't a very straight ahead process. This is particularly so if the weather is bad or the bees are robbing or your eyesight isn't too good or you've just had a heavy night.

If you stir apiaries up too much there's the danger of nuclei getting robbed out. Yes, the thought of looking for a queen does create a bit of a psychological barrier which deters some chaps from embracing plans that envisage large scale queen finding. Also, some beekeepers have been disappointed at the low percentage of matings from "tops". I had long formed an opinion that "tops" weren't the ideal place to mate queens from and had noted on occasions where much better matings were obtained from nucleus on separate stands than from "tops" in the same apiary and cells from the same batch. So I set out to make some comparisons and to see if I could streamline this splitting of hives and perhaps improve mating percentages. (Forster 1974).

A total of 172 hives were located in twelve apiaries. The ages of all queens were recorded. Seventy were first year, 48 second year, and 54 third year queens. I randomly allotted half of each age group in each apiary to an "A treatment" and half to a "B treatment".

In mid-October I manipulated all hives. In "A group" I made up a "top" in the conventional manner. That is; I found the queen, put her down in the bottom box with half the hive and raised the other half above a division board ready to take a queen cell. I put up extra bees to allow for drift back to the parent entrance below. I put a sheet of newspaper between the top box and the division board to temporarily close the entrance. This was to reduce drift back to the familiar entrance and to lessen the risk of robbing.

In the "B group" no attempt at all was made to find the queen. The second box was lifted off onto a division board. Then the combs in the bottom box were quickly pulled apart. Any combs below where the queen may have been, were removed with adhering bees ready to be put in the top box. The outside combs from the second box with adhering bees, but without the queen, were put down into the bottom box. A comb of brood was shaken clear of bees into the top box and this was put down below also. Food supplies for both halves were also checked. So we had all the nurse bees up top with the queen and all the old bees down below with no queen.

This operation could be carried out very quickly and in practically any weather. Once you get the swing of it, its amazingly simple.

Two days later queen cells were given to the queenless "tops" of group A and the queenless bottoms of group B. All hives were checked within a few days and as far as could be ascertained all cells had emerged except one. This was in group A where an old queen had inadvertently got up into the supposedly queenless "top". She had been found and put down but these things do happen. I was prepared to accept a few queens down where they shouldn't have been in the B treatment but none were found.

I awaited the results of mating with great interest. They turned out to be 78% for group A with the young queen on top; and 87% for group B, with the young queen down below. Not quite as spectacular as I thought, but the B method did give 9% more mated queens. I don't know what you chaps expect as a mating percentage but I feel the averages of both these groups were reasonably good.

The next move was to put the hives together without any queen finding. Apart from leaving both halves with a queen I planned to use the normal process of putting the portion of the hive with the young queen in the top position with a double sheet of newspaper in between her and the bees below. In this case of course, the bees below did have a queen. This is no new idea. It's as old as the hills. Still very little had been done as to recording detailed results.

Lundie, Root and Farrar all consider the young queen will usually survive if the storey containing her is placed on the top. They assume that the bees in the top storey will descend in force once they chew through the paper. The old queen is by now a stranger to them and so they will kill her. Grout believes the younger queen will invariably kill the older, or if the bees take a hand themselves, they will see that it is the old queen that is done away. Butler considers that the younger, more vigorous queen will usually be the one that "makes it". He considers there is a risk that both queens will be injured. A chap called Skirkyavichyas said he had shown that it is only queens of a similar age that fight

otherwise it's entirely up to the bees themselves. Various opinions have been expressed as to the effect of the ages of the queens involved and also the relative strength of the two colonies to be united.

Haydak and Dietz did some quite precise work on uniting queen-right colonies. They had the young queen in "tops" over a double wire gauze screen. They just replaced the screen with a queen excluder and let the bees sort it out. They found that in 57.3% of the cases the young queen survived, 10.3% the old queen survived, and in 32.4% of unitings both queens died.

This rather shook my confidence in my proposed manipulation. There was a difference though. Their young queens were over double screens. The old queen was not entirely shut off from the bees above, and was not a complete stranger to them. They did not use newspaper as a temporary barrier between the two components when uniting. There was no build up of pressure to drive the bees from the top straight down through the paper after being deprived of an entrance. Anyhow I went ahead to unite my hives. This was early in December.

In group A where the young queen was on top I merely removed the division board, put on a double sheet of newspaper and put the part with the young queen back on top. In group B you remember the young queen was down below, so what I did was to swap the two portions of the hive and put the old queen down on the bottom board with a double sheet of newspaper, then the storey with the young queen on top. I thought that not only would the old queen have bees that were strangers coming down from above once they had chewed through the paper but that there would be some strange bees coming in the entrance, which should further reduce the old queen's chances of survival.

I had recorded the age of each queen. I also recorded the bee strength of each of the units involved. Now what were the results of all this? Well 95% of the young queens survived in group A and 92% in group B. I had expected group B to have a slight

advantage here but it was the other way around. Only just of course. Nothing of significance.

What about the ages of the old queens? This made no difference at all. Whether one year, two years, or three years, about the same percentage of each pulled through. There was of course only eight old queens that did survive.

There was no pattern at all of bee strength and young queen survival. Overall, relative bee strength seemed to make little difference. In the one hive that lost the two queens the division and parent colony were of equal strength and both were exceptionally strong.

So to summarize. In Method A: (Finding the old queen and establishing a young queen on top) I obtained 74 laying queens established in the hive for each 100 queen cells. In method B: (Not finding the queen and mating the young queen from the bottom box). I obtained 80 young queens per 100 cells.

The young queens lost in uniting without dequeening were not a complete loss as their hives had the advantage of nearly two months of their egg laying.

In this work I used every hive in the twelve apiaries. If I had dropped out those not entirely suitable no doubt results would have been better. Some hives were a bit weak. Some did run low on stores. One Apiary was affected by the effect of kowhai nectar.

I would say results were quite satisfactory. That 6% extra laying queens from method B were worth having but the great thing was that method B takes much less time. It takes much less skill and can be carried out in almost any weather. It does involve two visits to an apiary and the disadvantage of this would depend on your present methods and how your apiaries are located. Even if you didn't adopt the system as a regular method you could switch to it with confidence if you did get caught with bad weather.

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CLOSING REMARKS

Mr Eric Smaellie
Superintendent of Beekeeping
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In concluding the Seminar, Mr E. Smaellie, Superintendent of Beekeeping, Ministry of Agriculture and Fisheries, said he expressed the feelings of all those that attended in that this had been a most successful Seminar. He paid particular thanks to the efforts of the Organising Committee for the way it prepared and ran the Seminar.

Mr Smaellie acknowledged many people associated with the Seminar, including all the speakers, for the high quality of their papers, Acacia Bay Apiaries Ltd. and Arataki Honey Ltd. for hosting the field-day, the caterers, and Mr Tony Lorimer for taping the sessions.

In organising this Seminar the Ministry of Agriculture and Fisheries appreciate the assistance given it by the National Beekeepers' Association, and in particular Mr J.D. Lorimer, the N.B.A's representative on the Organising Committee.

Finally, Mr Smaellie noted the widespread interest generated by this Seminar, and the numbers of younger-generation beekeepers in attendance - surely a healthy sign for the Industry's future.

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